



BULLETIN 132-13 | APRIL 2015

# MANAGEMENT OF THE CALIFORNIA STATE WATER PROJECT

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**Bulletin 132-13**

# **Management of the California State Water Project**

*Covers Calendar Year 2012 Activities*



*Published April 2015*

**Edmund G. Brown Jr.** *Governor*  
*State of California*

**John Laird** *Secretary for Natural Resources*  
*California Natural Resources Agency*

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## Foreword

*B*ulletin 132-13, Management of the California State Water Project, continues the Bulletin 132 annual series begun in 1963. Bulletin 132-13 reports water supply planning, construction, financing, management, and operation activities of the State Water Project (SWP). Appendix B contains data and computations used to determine the SWP water contractors' Statements of Charges for 2014. Appendix B was previously printed and distributed to SWP water contractors to document and support calculation of contractors' annual charges.

The Bulletin discusses significant events and issues that affect SWP management and operations. The Bulletin covers the period from January 1, 2012, through December 31, 2012.

Bulletin 132-13 also discusses water supply and delivery as well as Delta resources and environmental issues, local assistance programs, power resources, recreation, and financial analysis of the SWP.

Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than were available at the time of publication, please consult the most recent edition of Bulletin 132 or contact DWR staff in the State Water Project Analysis Office.



Mark W. Cowin  
*Director*





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## California Water Commission

The California Water Commission consists of nine members appointed by the Governor and confirmed by the Senate. Seven members are chosen for their expertise related to the control, storage, and beneficial use of water, and two are chosen for their knowledge of the environment. The commission advises the Director of the Department of Water Resources (DWR) on matters within DWR's jurisdiction, approves rules and regulations, and monitors and reports on the construction and operation of the State Water Project (SWP).

The roles and responsibilities of the California Water Commission are defined in the Water Code, Government Code, and Code of Civil Procedure.

The commission's SWP-specific responsibilities are to:

- conduct an annual review of the construction and operation of the SWP and report to DWR and the Legislature with any recommendations (Water Code Section 165);
- hold public hearings on all additional facilities proposed to be added to the SWP and name any new facilities (Water Code Sections 161.5 and 166); and
- adopt a resolution of necessity, and give each affected person a venue to be heard, before DWR may commence an eminent domain proceeding (Code of Civil Procedure Section 1245.210).

Commission members at the time of publication are:

Joseph Byrne (Chair)

Andrew Ball

Daniel Curtin

Joe Del Bosque (Vice-Chair)

Kimberley Delfino

Luther Hintz

David Orth

Armando Quintero

Anthony Saracino

# Acronyms and Abbreviations

## *Symbols*

**µg/L** micrograms per liter  
**µS/cm** microsiemens per centimeter

## **A**

**AB** Assembly Bill  
**af** acre-feet/acre-foot  
**ANS** Aquatic Nuisance Species  
**AWMP** Agricultural Water Management Plan

## **B**

**Bay-Delta** San Francisco Bay/Sacramento-San Joaquin Delta  
**Bay-Delta Estuary** San Francisco Bay/Sacramento-San Joaquin Delta Estuary  
**Bay-Delta Plan** Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary  
**BDCP** Bay Delta Conservation Plan  
**BO** biological opinion

## **C**

**CAISO** California Independent System Operator  
**CALFED** CALFED Bay-Delta Program  
**California State Parks** California Department of Parks and Recreation  
**C.A.S.T.** Catch A Special Thrill  
**CDPH** California Department of Public Health  
**CEQA** California Environmental Quality Act  
**CESA** California Endangered Species Act  
**cfs** cubic feet per second  
**CIMIS** California Irrigation Management Information System  
**CVC** Cross Valley Canal  
**CVFPB** Central Valley Flood Protection Board  
**CVP** Central Valley Project  
**CWC** California Water Code

## **D**

**D-1641** State Water Resources Control Board, Water Right Decision 1641  
**DDA** Davis-Dolwig Act  
**DFW** Department of Fish and Wildlife



**DHCCP** Delta Habitat Conservation and Conveyance Program  
**DMCP** Delta Mercury Control Program  
**DO** dissolved oxygen  
**DOE** Division of Engineering  
**DSC** Delta Stewardship Council  
**DSOD** Division of Safety of Dams  
**DWR** Department of Water Resources  
**DWSC** Deep Water Ship Channel

**E**

**EC** electrical conductivity or specific conductance  
**EIR** environmental impact report  
**EIS** environmental impact statement  
**EPA** U.S. Environmental Protection Agency  
**ESA** federal Endangered Species Act

**F**

**FERC** Federal Energy Regulatory Commission  
**FRFH** Feather River Fish Hatchery  
**FRP** Fish Restoration Program

**G**

**GHG** greenhouse gas

**H**

**HEA** Habitat Expansion Agreement  
**Hyatt-Thermalito** Hyatt Pumping-Generating Plant and Robie Thermalito Pumping-Generating Plant

**I**

**IFDM** Integrated On-Farm Drainage Management  
**IR** Interim Renewal  
**IRWM** Integrated Regional Water Management  
**ITP** incidental take permit

**K**

**kV** kilovolt  
**kWh** kilowatt hour(s)

**L**

**LADWP** Los Angeles Department of Water and Power  
**LTMS** Long-Term Management Strategy

**M**

**maf** million acre-feet  
**MeHg** methylmercury  
**mg/L** milligrams per liter  
**MIDS** Morrow Island Distribution System  
**MRTU** Market Redesign and Technology Upgrade  
**mS/cm** millisiemens per centimeter  
**MW** megawatt  
**MWh** megawatt hour(s)  
**MWQI** Municipal Water Quality Investigations  
**MWQP** Municipal Water Quality Program  
**MWT** McCormack-Williamson Tract

**N**

**NBA** North Bay Aqueduct  
**NDFCERP** North Delta Flood Control and Ecosystem Restoration Project  
**NDOI** Net Delta Outflow Index  
**NEPA** National Environmental Policy Act  
**NERC** North American Electric Reliability Corporation  
**NOAA Fisheries** National Marine Fisheries Service  
**NVE** NV Energy

**O**

**O&M** Division of Operations and Maintenance  
**OMP&R** operations, maintenance, power, and replacement  
**OM&R** operations, maintenance, and replacement

**P**

**PAO** Public Affairs Office  
**PG&E** Pacific Gas & Electric Company  
**POD** pelagic organism decline

**Q**

**QA/QC** quality assurance/quality control  
**QSA** Quantification Settlement Agreement

**R**

**Reclamation** Bureau of Reclamation  
**RETI** Renewable Energy Transmission Initiative  
**R&FWE** Recreation and Fish and Wildlife Enhancement  
**RIMPR** Renewable Integration Market and Product Review  
**RM** River Mile  
**RPA** reasonable and prudent alternative

**RRR** Red Rock Ranch  
**RRSDS** Roaring River Slough Distribution System  
**RST** rotary screw trap  
**RTDF-CP** Real Time Data and Forecasting Comprehensive Program  
**RWQCB** Regional Water Quality Control Board

**S**

**Sacramento Valley 40-30-30 Index** Sacramento Valley Water Year Hydrologic Classification  
**San Joaquin Valley 60-20-20 Index** San Joaquin Valley Water Year Hydrologic Classification  
**SARMP** Settlement Agreement Recreation Management Plan  
**SB** Senate Bill  
**SBA** South Bay Aqueduct  
**SBX7 7** Water Conservation Act of 2009  
**SCE** Southern California Edison  
**SDIP** South Delta Improvements Program  
**SFCWA** State and Federal Contractors Water Agency  
**SJRRP** San Joaquin River Restoration Program  
**SMPA** Suisun Marsh Preservation Agreement  
**SMSCG** Suisun Marsh Salinity Control Gates  
**SRCD** Suisun Resource Conservation District  
**SWAT** Soil Water Assessment Tool  
**SWP** State Water Project  
**SWPAO** State Water Project Analysis Office  
**SWRCB** State Water Resources Control Board

**T**

**tHg** total mercury

**U**

**USFWS** U.S. Fish and Wildlife Service

**W**

**WCD** water conservation district  
**WD** water district  
**WET** Water Education for Teachers  
**WQCP** water quality control plan

**Y**

**Yuba Accord** Lower Yuba River Accord

# SWP Long-term Water Contractors

The State Water Project long-term water supply contractors are listed below, followed by shortened forms of their names that are used in Bulletin 132.

Alameda County Flood Control and Water Conservation District, Zone 7	Alameda-Zone 7
Alameda County Water District	Alameda County
Antelope Valley-East Kern Water Agency	AVEK
Castaic Lake Water Agency	Castaic Lake
City of Yuba City	Yuba City
Coachella Valley Water District	Coachella
County of Butte	Butte
County of Kings	Kings
Crestline-Lake Arrowhead Water Agency	Crestline
Desert Water Agency	Desert
Dudley Ridge Water District	Dudley Ridge
Empire West Side Irrigation District	Empire
Kern County Water Agency	Kern
Littlerock Creek Irrigation District	Littlerock
The Metropolitan Water District of Southern California	Metropolitan
Mojave Water Agency	Mojave
Napa County Flood Control and Water Conservation District	Napa
Oak Flat Water District	Oak Flat
Palmdale Water District	Palmdale
Plumas County Flood Control and Water Conservation District	Plumas
San Bernardino Valley Municipal Water District	San Bernardino
San Gabriel Valley Municipal Water District	San Gabriel
San Geronio Pass Water Agency	San Geronio
San Luis Obispo County Flood Control and Water Conservation District	San Luis Obispo
Santa Barbara County Flood Control and Water Conservation District	Santa Barbara
Santa Clara Valley Water District	Santa Clara
Solano County Water Agency	Solano
Tulare Lake Basin Water Storage District	Tulare
Ventura County Watershed Protection District	Ventura





## State Water Project Highlights

*The California Aqueduct/Delta-Mendota Canal intertie went into operation in July 2012.*







The annual Bulletin 132 series began in 1963 and reported the first deliveries of water by the new State Water Project (SWP). Bulletin 132-13, *Management of the California State Water Project*, continues this series as the fifty-first edition. It reports on SWP planning, construction, finance, management, and operations during calendar year 2012. The SWP is operated and maintained by the California Department of Water Resources (DWR).

The SWP is one of the world's largest water, power, and conveyance systems. In the past decade it has conveyed an annual average of 2.9 million acre-feet (maf) of water. SWP facilities—pumping and power plants; reservoirs, lakes, and storage tanks; canals, tunnels, and pipelines—capture, store, and convey water to public water agencies and local water districts.

## 50 Years of State Water Project Deliveries

In May 1962, the first SWP water delivery was pumped from Bethany Reservoir through the South Bay Pumping Plant and into the South Bay Aqueduct for delivery to Bay Area water users. The South Bay Aqueduct was the first conveyance facility constructed for the SWP.

## 50th Anniversary of San Luis Reservoir Groundbreaking

August 18, 2012, marked the 50th anniversary of the groundbreaking ceremonies for the San Luis Reservoir, which is used by both the SWP and the federal Central Valley Project (CVP). On August 18, 1962, President John F. Kennedy joined California Governor Edmund G. "Pat" Brown, Sr., to celebrate the State-federal partnership that led to construction of the joint-use facility that is still the largest off-stream reservoir in the United States. The reservoir was created by construction of the B. F. Sisk San Luis Dam.

## Intertie Links SWP and CVP

On May 2, State and federal water officials dedicated a pair of new permanent pipelines, known as the "intertie," that link the

SWP's California Aqueduct and the CVP's Delta-Mendota Canal, near Tracy, south of the Delta.

## Yearly Activities Summary

### 2012 Precipitation and Water Storage

Water stored and delivered by the SWP conservation and transportation facilities originates from rainfall and snowmelt in Northern and Central California watersheds, where most of the State's precipitation occurs. DWR monitors and records annual precipitation and runoff during each water year, which begins on October 1 and ends on September 30.

### Precipitation and Mountain Snowpack in Water Year 2011–2012

California experienced below-average rainfall and mountain snowpack during water year 2011–2012. The State received precipitation at 77 percent of average in 2011–2012, compared to 136 percent of average in 2010–2011. The Northern Sierra 8-Station Precipitation Index finished the water year with 41.6 inches of precipitation (83 percent of average). The statewide average snow water equivalent, based on snow sensors, reported for April 1 was 15.3 inches, or 54 percent of average.

### **River Runoff**

Statewide river runoff totaled 62 percent of average in the 2011–2012 water year. Runoff in the Sacramento River Region, the San Joaquin 4 Rivers, and Tulare Lake Region was 65, 46, and 51 percent of average, respectively.

### **Water Supply Indices**

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were “below normal” and “dry,” respectively, based on all observed data for water year 2011–2012.

### **Water Year 2011–2012 Storage Totals**

At the end of the 2011–2012 water year, water storage in major SWP reservoirs and the State’s share of joint-use reservoirs was 3.1 maf or 56 percent of maximum storage, compared to 4.64 maf or 85 percent of maximum storage at the end of water year 2010–2011. The average end-of-month total storage for the 2010–2011 water year in major SWP reservoirs was 3.56 maf. End-of-water-year storage on September 30, 2012, at Lake Oroville was 1.98 maf, which was about 1.07 maf less than the previous water year.

### **Calendar Year 2012 Storage Total**

The total storage in major SWP reservoirs was about 3.55 maf at the end of 2012, compared with 4.10 maf in 2011. The State’s share of San Luis Reservoir storage was 426,332 acre-feet (af) on December 31, 2012, compared with 964,240 af at the same time in 2011. The combined storage in the southern reservoirs was 598,653 af on December 31, 2012, compared with 586,234 af at the same time in 2011.

### **Diversions from the Delta**

In 2012, the SWP diverted 2,307,621 af at Banks Pumping Plant. There was 31,926 af

of Cross Valley Canal water and 29,696 af of CVP water wheeled at Banks Pumping Plant by DWR during 2012.

Maximum daily Delta exports occurred on August 7, 2012, at 23,984 af. Combined SWP and CVP monthly Delta exports in 2012 varied from a low of 135,213 af in April, to a high of 672,341 af in August. In 2012, Delta exports totaled approximately 4.6 maf.

For more information, see Chapter 8, Water Supply.

## **2012 Water Supplies, Contracts, and Deliveries**

### **2012 Water Deliveries**

DWR approved delivery of 2.50 maf on November 18, 2011, resulting in initial Table A amounts of 60 percent of most SWP water contractor requests. DWR increased the 2012 Table A amounts to 2.71 maf, for a final allocation of 65 percent, on April 16, 2012. For more information on changes in Table A amounts that were approved by DWR, see Chapter 9, Water Contracts and Deliveries.

In 2012, 3,967,453 af of SWP and non-SWP water was delivered to 29 long-term SWP water contractors and 21 other agencies.

The portion delivered to the SWP water contractors was 2,836,231 af, categorized as follows:

- 1,797,929 af of Table A water;
- 346,064 af of transferred Table A water;
- 34,738 af of exchanged Table A water;
- 7,740 af of Pool A water;
- 1,027 af of Article 21 water;
- 393,435 af of Carryover water (Article 12(e) and Article 56(c));
- 105,128 af recovered from water banks;
- 35,000 af of flexible storage withdrawal;
- 2,300 af of settlement water;

- 3 af of SWP water for recreation and fish and wildlife;
- 7,588 af of 2012 Dry Year Purchase Program water;
- 16,899 af of local water;
- 28,414 af of water transfer;
- 54,624 af of general conveyance water;
- 4,343 af of operations exchange water; and
- 999 af of permit water.

The remaining portion was delivered to 21 non-SWP agencies and totaled 1,131,222 af, which was categorized accordingly:

- 1,072,695 af of local water;
- 1,606 af of SWP water for recreation and fish and wildlife;
- 56,921 af delivered to satisfy agreements between the SWP and CVP.

Table H-1 shows SWP water deliveries by category for 1962 through 2012.

For more information, see Chapter 9, Water Contracts and Deliveries.

## Power Resources

In 2012, DWR sold 575,388 megawatt hours (MWh) of energy for a total of \$17.47 million. However, after applying California Independent System Operator (CAISO) sale offset adjustments, the total revenue was \$1.45 million. These sales include 532,800 MWh of energy with revenue of \$15.93 million transacted through WSPP and sold to four marketers and three electric utilities. DWR also received \$103.57 million in revenues for capacity and other energy related services. This value includes, among other things, \$100.19 million for ancillary services transactions made through CAISO. It also includes \$299,917 for ancillary service fees collected from the U.S. Department of Energy, Western Area Power Administration, associated with a June 27, 2012, contract

with DWR for CAISO Scheduling Coordinator Services.

The sidebar, State Water Project Power Generation and Consumption in 2012, summarizes amounts of power generated and consumed by the SWP. For detailed information, see Chapter 10, Power Resources.

## Oroville Facilities Relicensing

On January 26, 2005, DWR filed an application with the Federal Energy Regulatory Commission (FERC) requesting a new license for the Oroville Facilities (FERC Project No. 2100). The existing 50-year hydropower license expired January 31, 2007, and, until a new license is issued, FERC is issuing annual licenses. A partial list of SWP facilities that will be subject to the new license terms and conditions is available in Chapter 10, Power Resources.

A number of significant events associated with Oroville Facilities relicensing occurred in 2012. For details, see Chapter 3, Environmental Programs; Chapter 6, Legislation and Litigation; Chapter 10, Power Resources; and Chapter 13, Recreation.

## Financial Analysis

In 2012, DWR continued to pay bondholders as scheduled. The SWP was financially viable and was indirectly paid for by the approximately 25 million water users served by the project. Direct payment was through the 29 long-term water contractors. In 2012, the SWP handled approximately \$1.06 billion in revenues and \$1.06 billion in expenses. The 2012 Income Statement for the State Water Project sidebar presents a summary of the year's revenues and expenses. For detailed information, see Chapter 14, Financial Analysis.

**Table H-1 SWP Water Delivered by Category, 1962–2012 (acre-feet)**

Year	Table A Water			Article 21/Unscheduled		Other SWP Water Deliveries			Total Deliveries
	Municipal and Industrial	Agricultural	Total Table A <sup>a</sup>	Municipal and Industrial	Agricultural	Other Water <sup>b</sup>	Feather River Diversions <sup>c</sup>	Fish & Wildlife/ Recreation Water	
1962	—	—	—	—	—	9,704	7,499	—	17,203
1963	—	—	—	—	—	13,212	16,049	—	29,261
1964	—	—	—	—	—	21,743	17,891	—	39,634
1965	—	—	—	—	—	35,985	27,425	—	63,410
1966	—	—	—	—	—	59,599	33,361	—	92,960
1967	5,563	5,791	11,354	0	0	45,225	24,639	—	81,218
1968	86,541	85,168	171,709	10,000	111,534	1,214	903,367	—	1,197,824
1969	63,956	129,064	193,020	0	72,397	8,692	832,454	—	1,106,563
1970	83,415	150,578	233,993	0	131,848	25,401	804,320	—	1,195,562
1971	93,776	263,564	357,340	0	294,581	35,438	825,886	8	1,513,253
1972	186,796	425,005	611,801	0	422,322	53,848	875,529	6,489	1,969,989
1973	297,497	395,391	692,888	0	294,916	29,540	851,285	1,155	1,869,784
1974	423,982	450,093	874,075	0	412,453	31,493	963,956	2,118	2,284,095
1975	670,492	553,498	1,223,990	356	620,329	46,995	924,696	3,377	2,819,743
1976	631,876	741,126	1,373,002	4,147	547,538	103,546	1,018,653	1,745	3,048,631
1977	354,930	218,966	573,896	0	0	410,991	624,497	1,111	1,610,495
1978	782,625	529,740	1,312,365	0	16,215	177,245	836,864	1,691	2,344,380
1979	692,888	711,404	1,404,292	0	646,830	431,693	933,067	1,766	3,417,648
1980	726,545	784,946	1,511,491	52,200	350,017	40,269	925,750	2,131	2,881,858
1981	1,053,273	835,852	1,889,125	18,920	889,508	283,310	993,785	4,688	4,079,336
1982	916,014	822,042	1,738,056	140	214,994	144,267	819,586	4,646	2,921,689
1983	482,749	701,370	1,184,119	0	13,019	172,030	633,778	7,849	2,010,795
1984	725,799	861,794	1,587,593	3,663	259,254	366,273	891,128	7,040	3,114,951
1985	983,341	929,424	1,912,765	9,638	292,206	474,417	924,049	4,033	3,617,108
1986	998,611	1,009,295	2,007,906	2,595	21,755	177,176	843,040	3,865	3,056,337
1987	1,079,983	1,033,932	2,113,915	6,949	107,958	375,810	882,301	7,672	3,494,605
1988	1,308,071	1,068,302	2,376,373	0	0	520,375	884,877	4,889	3,786,514
1989	1,602,543	1,251,204	2,853,747	0	0	474,559	830,500	8,135	4,166,941
1990	1,876,072	706,079	2,582,151	0	90	424,697	875,099	9,262	3,891,299
1991	536,669	12,444	549,113	3,521	0	543,582	565,395	4,879	1,666,490
1992	955,687	455,112	1,410,799	1,156	0	166,992	613,978	2,605	2,195,530
1993	1,069,258	1,243,978	2,313,236	0	0	256,853	822,589	2,609	3,395,287
1994	1,134,992	614,359	1,749,351	48,150	64,475	236,739	874,018	8,200	2,980,933
1995	801,570	1,165,523	1,967,093	17,984	46,346	85,560	860,077	2,575	2,979,635
1996	1,143,638	1,371,186	2,514,824	12,091	16,556	252,346	1,005,148	3,907	3,804,872
1997	1,220,200	1,040,183	2,260,383	2,814	18,618	322,000	993,211	4,146	3,601,172
1998	865,795	860,724	1,726,519	9,982	10,306	127,405	872,738	2,108	2,749,058
1999	1,405,311	1,333,592	2,738,903	61,191	96,879	85,312	1,108,672	4,324	4,095,281
2000	1,968,161	1,231,745	3,199,906	170,302	138,483	333,384	1,085,886	4,030	4,931,991
2001	1,168,333	365,930	1,534,263	10,261	33,174	535,147	1,077,997	2,929	3,193,771
2002	1,849,052	715,805	2,564,857	9,502	27,663	272,277	1,131,880	3,694	4,009,873
2003	2,102,557	787,658	2,890,215	5,397	29,629	233,069	1,006,995	2,846	4,168,151
2004	1,951,657	643,342	2,594,999	103,890	112,949	341,922	1,171,835	2,865	4,328,460
2005	1,877,647	948,563	2,826,210	186,787	544,296	92,858	1,074,706	1,506	4,726,363
2006	1,973,268	998,583	2,971,851	293,358	327,981	119,405	1,112,551	1,936	4,827,082
2007	1,572,198	509,019	2,081,217	185,825	124,148	449,935	1,217,990	2,581	4,061,696
2008	1,015,241	218,999	1,234,240	2,729	0	488,818	1,109,563	2,778	2,838,128
2009	883,760	348,860	1,232,620	6,032	0	559,553	1,005,986	2,047	2,918,056
2010	1,427,202	503,727	1,930,929	7,505	0	449,935	1,217,990	1,167	3,505,140
2011	1,871,986	975,586	2,847,572	207,568	213,246	332,277	1,028,542	1,593	4,630,798
2012	1,865,557	714,349	2,579,906	1,027	0	337,079	1,047,832	1,609	3,967,453
<b>Total</b>	<b>46,787,077</b>	<b>31,722,895</b>	<b>78,509,972</b>	<b>1,455,680</b>	<b>7,524,513</b>	<b>11,694,467</b>	<b>41,963,070</b>	<b>150,604</b>	<b>141,298,306</b>

<sup>a</sup> Includes Table A, Table A transfers, Table A exchanges, Carryover, and Pool Water.

<sup>b</sup> Includes water conveyed for SWP and non-SWP water contractors.

<sup>c</sup> Includes amounts of water diverted according to various water rights agreements.



## Engineering, Construction, and Real Estate

In 2012, engineering, construction, and real estate work to enhance, expand, repair, and protect the SWP and other facilities within the State continued. Significant projects included the South Bay Aqueduct enlargement, expansion of the South Bay Pumping Plant, Edmonston Pumping Plant refurbishment, Hyatt Powerplant pump-turbine refurbishment, Perris Dam remediation, and the East Branch Extension Phase I improvements and Phase II projects.

DWR worked on 58 construction contracts in 2012. Projects included turbine and pump replacement, pipeline repair, trash rack upgrade at fish hatcheries, and recreational and maintenance facility improvements at dam and reservoir sites.

DWR processed a net total of \$2.6 million in payments in 2012 in support of right-of-way activities required for the construction, operation, and maintenance of the SWP. DWR also conducted real estate activities related to SWP acquisitions, temporary permits, property management, and appraisals.

For more information, see Chapter 12, Engineering, Construction, and Real Estate.

## Delta Resources and Environmental Issues

### *Delta Stewardship Council*

The final draft *Delta Plan* and the associated recirculated draft programmatic environmental impact report and notice of proposed rulemaking were released on November 30, 2012.

### *Bay Delta Conservation Plan*

In February 2012, the California Natural Resources Agency released the preliminary administrative draft of the Bay Delta

Conservation Plan and a complete administrative draft of the environmental impact statement/environmental impact report for the plan to the lead agencies for review.

### *Longfin Smelt*

The U.S. Fish and Wildlife Service added the San Francisco Bay-Delta distinct population segment of Longfin Smelt to the list of candidate species for federal Endangered Species Act protection.

The 2012 abundance index for Longfin Smelt dropped to the second lowest value on record since 1967.

### *Spring-run Chinook Salmon*

The 2012 escapement estimates for the Feather River Fish Hatchery and for naturally spawned fish in Mill, Deer, and Butte creeks were the highest estimates observed since 2006.

### *Fish Restoration Program*

DWR finalized the Fish Restoration Program *Implementation Strategy* in March 2012.

### *Climate Change*

In 2012, several climate change studies were initiated or ongoing. For more information, see Chapter 3, Environmental Programs.

DWR completed and approved Phase I of the Climate Action Plan. The *Greenhouse Gas Emissions Reduction Plan* documents DWR's progress and future plans for reducing greenhouse gas emissions.

### *Recreation*

In 2012, SWP facilities supported an estimated 4.1 million recreation days of use, up less than one percent from 2011 and down slightly from the 4.3 million days reported in 2010. SWP recreation use was concentrated at the lakes and major

## State Water Project Power Generation and Consumption in 2012

Power Generation and Consumption	Megawatt Hours
Energy generation by SWP facilities	4,198,000
Energy sources and firm purchases under agreements and exchanges	3,741,000
<b>Total Energy Available to the SWP</b>	<b>7,939,000</b>
Energy sales	(533,000)
<b>Net SWP Power Consumption<sup>a</sup></b>	<b>7,407,000</b>

<sup>a</sup> Totals may not sum due to rounding.

reservoirs, with 37 percent occurring in the Oroville Field Division and 40 percent occurring in the Southern Field Division. For further recreation information, see Chapter 13, Recreation.

### SWP Security Measures

Security and protection of the SWP remain primary goals for DWR. SWP facilities are closely monitored, and DWR staff are vigilant in maintaining a secure environment. Security patrols of SWP facilities are frequent and ongoing, and plans are in place to address potential or actual acts of terrorism. Security system improvements continue in conjunction with the Bureau of Reclamation and other federal and State agencies.

### SWP Milestones through the Decades

#### 50 Years Ago—1962

President John F. Kennedy and California Governor Edmund G. “Pat” Brown, Sr. join in a dedication ceremony for the San Luis Dam and Reservoir in the San Joaquin Valley west of Los Banos.

In May, the first SWP water deliveries were made from the South Bay Aqueduct to contractors in the southern San Francisco Bay Area.

#### 40 Years Ago—1972

Buena Vista, Teerink, and Oso pumping plants were completed.

In March, the first water deliveries were made south of the Tehachapi Mountains.

## 2012 Income Statement for the State Water Project

<b>Revenues</b>	<b>Thousands of Dollars</b>
Water Contract Payments	1,117,950
Revenue Bond Cover Adjustments	(51,980)
Rate Management Adjustments	(40,470)
Other Revenues	32,054
<b>Total Operating Revenues</b>	<b>1,057,554</b>
<b>Expenses</b>	
Project Operations, Maintenance, Power, and Replacement	723,133
Deposits to Reserves	27,653
Water Bond Principal	182,769
Water Bond Interest	123,999
<b>Total Operating Expenses and Debt Service</b>	<b>1,057,554</b>
<b>Net System Revenues</b>	<b>0</b>

Cedar Springs Dam and Silverwood Lake were dedicated in May.

In October, the California Aqueduct Bikeway from Bethany Reservoir to San Luis Forebay was officially dedicated, and Perris Dam was completed 6 months ahead of schedule.

The Devil Canyon Powerplant was dedicated and began operation in December.

By the end of 1972, 99.9 percent of the facilities required to fulfill initial water delivery commitments were either completed or under construction.

### 30 Years Ago—1982

In June, voters rejected Proposition 9, which would have authorized building the Peripheral Canal.

In December, the California Aqueduct was renamed the Governor Edmund G. Brown California Aqueduct.

### 20 Years Ago—1992

Early in the year, operational restrictions were imposed on the SWP and CVP to protect winter-run Chinook Salmon.

In April, Governor Wilson announced a long-term comprehensive water policy that takes into account the needs and concerns of each of the major interests in water use and development. It included fixing the Sacramento-San Joaquin Delta; protecting groundwater resources and fish and wildlife; and promoting water marketing, water conservation, and water recycling.

The four pumps added to Banks Pumping Plant were operational in April.

Construction of the Devil Canyon Powerplant Second Afterbay began in November.

### **10 Years Ago—2002**

DWR initiated the Dry Year Water Purchase Program.

Initial filling of Crafton Hills Reservoir was completed in September.





# Chapter 1

## The State Water Project

*The California Aqueduct at dusk.*

*T*his chapter primarily provides background on the State Water Project (SWP), including brief descriptions of SWP facilities, planning, construction, power operations, financing, contracting agencies, and the project's many uses and functions. It also provides a glimpse of California history, with a look at the processes and decisions that went into the creation of the largest state-built water project in the country.

Chapters 2 through 15 provide more detail on significant events and specific topics related to management of the SWP in calendar year 2012. At the end of the bulletin, Appendix B presents data and computations used to determine the SWP Contractors' Statements of Charges for 2014.

*Information in this chapter was contributed by the Division of Operations and Maintenance and the State Water Project Analysis Office.*

California's diverse geography contains both the highest and lowest elevations in the coterminous United States, with a resulting diversity of climate that ranges from desert to alpine to subtropical. In a typical year, some areas receive as little as 2 inches of rain, while others receive more than 100 inches. This diversity of geography and climate creates an intricate and constantly changing pattern of water supplies, which, in turn, creates enormous challenges in managing this vital resource.

## The State Water Project

Like present-day Californians, the earliest settlers faced the problem of how best to conserve, control, and deliver water. Remains of aqueducts, canals, and dams are still found near some of California's original missions. The first recorded aqueduct, built in 1770 to serve the San Diego mission, was 6 miles long. In the early twentieth century, several cities, including San Francisco and Los Angeles, built aqueducts to convey water from the Sierra Nevada to other parts of the State.

In 1951, after many years of discussion and study, the Legislature authorized construction of a water storage and supply system to capture and store rainfall and snowmelt runoff in Northern California and deliver it to areas of need throughout the State. Eight years later, the Legislature passed the Burns-Porter Act, which provided the mechanism for obtaining funds necessary to construct the initial State Water Project (SWP) facilities. In 1960, California voters approved an issue of \$1.75 billion in general obligation bonds, as authorized in the act, thereby securing funds to build the SWP. In 1962, the first water was delivered through a portion of the South Bay Aqueduct to two long-term contracting agencies in Alameda County.

Today the SWP, built, operated, and managed by the Department of Water Resources (DWR), is the largest state-built,

multipurpose, user-financed water project in the country. It was designed and built to deliver water, control flooding, generate power, provide recreational opportunities, and enhance habitat for fish and wildlife. SWP water irrigates about 750,000 acres of farmland, mainly in the southern San Joaquin Valley. Approximately 25 million of California's estimated 37 million residents benefit from SWP water.

## Precipitation and Runoff

The water stored and delivered by the SWP originates from rainfall and snowmelt runoff in Northern and Central California's watersheds, where most of the State's precipitation occurs.

Since 1968, DWR has monitored and recorded annual precipitation and runoff, because precipitation, snowpack, and the rate and amount of snowmelt help determine how much water the SWP can deliver in any given year. The DWR-designated water year is October 1 through September 30.

## Water Delivery Facilities

The SWP depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, and aqueducts to deliver water. Although initial water transportation facilities were essentially completed in 1973, other facilities have since been built, and still others are either under construction or are planned to be built, as needed.

The SWP facilities include 30 dams (29 of which impound water), 20 reservoirs, 29 pumping and generating plants, and approximately 700 miles of aqueducts. Figure 1-1 shows the names and locations of primary water delivery facilities. For more information about existing long-term SWP water supply contracts and annual water deliveries, see Table 1-6 (at the end of this chapter) and Chapter 9, Water Contracts and Deliveries.

Changes have occurred since the long-term SWP water supply contracts were signed in the 1960s, including population growth, differences in local water use, local water conservation programs, and conjunctive-use programs. Demands for SWP water are expected to increase and change as California's population continues to grow and as the potentially serious effects of climate change impact the State's water resources.

## Project Design

Water from rainfall and snowmelt runoff is stored in SWP conservation facilities and delivered via SWP transportation facilities to water agencies and districts in the Upper Feather River, North Bay, South Bay, San Joaquin, Central Coastal, and Southern California areas.

Three small reservoirs—Antelope Lake, Lake Davis, and Frenchman Lake—are the northernmost SWP facilities. Situated on Feather River tributaries in Plumas County, these lakes are used primarily for recreation. They also provide water to the City of Portola and local agencies that have water rights agreements with DWR.

Downstream from these lakes lies Lake Oroville, which conserves water from the Feather River watershed. Created by Oroville Dam, the tallest earthfill dam in the Western Hemisphere, Lake Oroville is the project's

largest storage facility with a capacity of approximately 3.5 million acre-feet (af).

Releases from Lake Oroville flow down the Feather River into the Sacramento River, which drains the northern portion of California's great Central Valley. The Sacramento River flows into the Sacramento-San Joaquin Delta, comprising 738,000 acres of land interlaced with channels that receive runoff from 40 percent of the State's land area. The SWP, federal Central Valley Project (CVP), and local agencies all divert water from the Delta.

From the northern Delta, Barker Slough Pumping Plant diverts water for delivery to Napa and Solano counties through the North Bay Aqueduct, which was completed in 1988. Near Byron, in the southern Delta, the SWP diverts water into Clifton Court Forebay for delivery south of the Delta. Banks Pumping Plant lifts water from Clifton Court Forebay into the California Aqueduct, which flows to Bethany Reservoir. From Bethany Reservoir, the South Bay Pumping Plant lifts water into the South Bay Aqueduct to supply Alameda and Santa Clara counties. The South Bay Aqueduct provided initial deliveries in 1962 and has been fully operational since 1965.

Most of the water delivered to Bethany Reservoir from Banks Pumping Plant flows into the California Aqueduct. This 444-mile-long main aqueduct conveys water to the agricultural lands of the San Joaquin Valley and to the urban regions of Southern California.

The California Aqueduct winds along the west side of the San Joaquin Valley. It transports water to O'Neill Forebay, Gianelli Pumping-Generating Plant, and San Luis Reservoir. San Luis Reservoir has a storage capacity of more than 2 million af and is jointly owned by DWR and the Bureau of Reclamation (Reclamation). DWR's share of gross storage in the reservoir is 1,062,183 af. Generally, water is pumped into San Luis





Figure 1-1 Names and Locations of Primary Water Delivery Facilities, December 31, 2012

Reservoir from late fall through early spring, where it is temporarily stored for release back to the California Aqueduct to meet summertime peaking demands of SWP and CVP water contractors.

SWP water not stored in San Luis Reservoir and water released from San Luis flows south through the San Luis Canal, a portion of the California Aqueduct jointly owned by DWR and Reclamation.

As the water flows through the San Joaquin Valley, numerous turnouts convey it to farmlands within the service areas of the SWP and CVP. Along its journey, this water is lifted more than 1,000 feet by four pumping plants—Dos Amigos, Buena Vista, Teerink, and Chrisman—before reaching the foot of the Tehachapi Mountains.

In the southern San Joaquin Valley, near Kettleman City, Phase I of the Coastal Branch Aqueduct serves agricultural areas west of the California Aqueduct. In August 1997, completion of Phase II extended the Coastal Branch Aqueduct to serve municipal and industrial water users in San Luis Obispo and Santa Barbara counties.

The remaining water conveyed by the California Aqueduct is delivered to Southern California, home to roughly two-thirds of California's population. Before it can be delivered, the water must first cross the Tehachapi Mountains. Fourteen 80,000-horsepower pumps at Edmonston Pumping Plant, situated at the foot of the mountains, raise the water 1,926 feet—the highest single lift of any pumping plant in the world. The water enters 8.5 miles of tunnels and siphons as it flows into Antelope Valley, where the California Aqueduct divides into two branches: the East Branch and the West Branch.

The East Branch carries water through Alamo Powerplant, Pearblossom Pumping Plant, and Mojave Siphon Powerplant into

Silverwood Lake in the San Bernardino Mountains. From Silverwood Lake, water flows through the San Bernardino Tunnel to Devil Canyon Powerplant. Water continues down the East Branch through the Santa Ana Pipeline to Lake Perris, the southernmost SWP reservoir.

The East Branch Extension is a nearly 33-mile pipeline linking parts of service areas for San Bernardino Valley Municipal Water District and San Geronio Pass Water Agency to the California Aqueduct. The East Branch Extension, Phase I, carries water from Devil Canyon Powerplant Afterbay to Cherry Valley, bringing water to Yucaipa, Calimesa, Beaumont, Banning, and other communities. Phase II, when completed, will assist with this delivery.

Water in the West Branch flows through Oso Pumping Plant, Quail Lake, and then from the Peace Valley Pipeline through Warne Powerplant into Pyramid Lake in Los Angeles County. From there it flows through the Angeles Tunnel, Castaic Powerplant, Elderberry Forebay, and into Castaic Lake, terminus of the West Branch. Castaic Powerplant is operated by the Los Angeles Department of Water and Power.

The energy needed to operate the SWP, the largest single user of electrical power in California, comes from a combination of its own hydroelectric and coal-fired generating plants and power purchased from and exchanged with other utilities. The coal-fired plant and the project's eight hydroelectric power plants, including four pumping-generating plants, produce enough electricity in a normal year to supply about two-thirds of the SWP's necessary operating power.

Tables 1-1 through 1-5 present statistical information about primary storage facilities, primary dams, pumping plants, power plants, and aqueducts.

**Table 1-1 Physical Characteristics of Primary Storage Facilities**

Facility	Data at Absolute Maximum Elevation		
	Gross Capacity (acre-feet)	Surface Area (acres)	Shoreline (miles)
Antelope Lake	22,600	930	15
Frenchman Lake	55,500	1,580	21
Lake Davis	84,400	4,030	32
Lake Oroville	3,537,600	15,810	167
Thermalito Forebay	11,800	630	10
Thermalito Afterbay	57,000	4,300	26
Thermalito Diversion Pool	13,400	320	10
Clifton Court Forebay	31,300	2,180	8
Bethany Reservoir	5,100	180	6
Lake del Valle	77,100	1,060	16
San Luis Reservoir	2,027,800	12,520	65
SWP storage, 1,062,183 af			
O'Neill Forebay	56,400	2,700	12
SWP storage, 29,500 af			
Los Banos Reservoir	34,600	620	12
Little Panoche Reservoir	5,600	190	6
Quail Lake	7,600	290	3
Pyramid Lake	171,200	1,300	21
Elderberry Forebay	32,500	500	7
Castaic Lake	323,700	2,240	29
Silverwood Lake	75,000	980	13
Lake Perris	131,500	2,320	10

## Future Planning and Construction

The planning, design, and construction of SWP facilities were based on studies and analyses that projected SWP water contractor annual water delivery needs. To meet these projected needs, water conservation reservoirs, storage facilities, and delivery facilities were planned to be constructed in stages as demands for water increased. Lake Oroville and San Luis Reservoir were the first SWP conservation reservoir facilities constructed. Additional

facilities were scheduled to meet increased demands. It was anticipated that population growth in delivery service areas and water supply areas of origin would influence the final schedule for SWP facilities. Increasingly, issues such as escalating costs, environmental concerns, and increased non-SWP demand for limited water supplies have become important factors affecting the planning and construction of new facilities.

In response to changes in water management policy, DWR continues to reassess plans for additional facilities that will incorporate increased environmental safeguards, while also increasing SWP delivery yield. Developing these plans involves the time-consuming process of finding technically suitable projects and satisfying many complex and dynamic environmental procedures, laws, and regulations.

## Climate Change

Planners are also concerned about climate change and its potentially serious effects on water resources. Temperature increases may affect water demand and aquatic ecosystems. Projected increases in air temperature may lead to changes in the amount, timing, and form of precipitation—rain or snow; changes in the volume and timing of runoff; Delta water quality changes due to sea-level rise; and changes in the amount of irrigation water needed due to modified evapotranspiration rates.

The ability of the SWP and CVP to meet the water demands of their customers and the environment depends on the accumulation of mountain snow and subsequent spring and summer snowmelt runoff. A warming climate may reduce this natural water storage mechanism.

To address these concerns, DWR and Reclamation formed a joint Climate Change Work Team to provide qualitative and quantitative assessments of the potential

**Table 1-2 Physical Characteristics of Primary Dams**

Facility	Crest Elevation (feet)	Structural Height (feet)	Crest Length (feet)	Structural Volume (thousand cubic yards)
Antelope	5,025	120	1,320	380
Frenchman	5,607	139	720	537
Grizzly Valley	5,785	132	800	253
Oroville	922	770	6,920	80,000
Thermalito Diversion	233	143	1,300	154
Thermalito Forebay	231	91	15,900	1,840
Thermalito Afterbay	142	39	42,000	5,020
Clifton Court Forebay	14	30	36,500	2,440
Bethany	250	121	3,940	1,400
Del Valle	773	235	880	4,150
Sisk	554	385	18,600	77,645
O'Neill Forebay	233	88	14,350	3,000
Los Banos Detention	384	167	1,370	2,100
Little Panoche Detention	676	152	1,440	1,210
Pyramid	2,606	400	1,090	6,800
Elderberry Forebay	1,550	200	1,990	6,000
Castaic	1,535	425	4,900	46,000
Cedar Springs	3,378	249	2,230	7,600
Perris	1,600	128	11,600	20,000
Crafton Hills	2,932	95	500	144

**Table 1-3 Pumping Plant Characteristics**

Facility	Number of Units	Normal Static Head (feet)	Total Flow at Design Head (cfs)	Total Motor Rating (hp)
Robie Thermalito	3 (p-g) <sup>a</sup>	85-102	9,120	120,000
Hyatt	3 (p-g) <sup>a</sup>	500-625	5,610	519,000
Barker Slough	9	95-120	228	4,800
Cordelia	11	138		
Banks	11	236-252	10,670	333,000
South Bay	9	566	330	27,750
Del Valle	4	0-38	120	1,000
Gianelli	8 (p-g) <sup>a</sup>	99-327	11,000	504,000
Dos Amigos	6	107-125	15,450	240,000
Las Perillas	6	55	461	4,050
Badger Hill	6	151	454	11,750
Devil's Den <sup>b</sup>	6	521	134	10,500
Bluestone <sup>b</sup>	6	484	134	10,500
Polonio Pass <sup>b</sup>	6	533	134	10,500
Buena Vista <sup>b</sup>	10	205	5,405	144,500
Teerink <sup>b</sup>	9	233	5,445	150,000
Chrisman <sup>b</sup>	9	518	4,995	330,000
Edmonston <sup>b</sup>	14	1,926	4,480	1,120,000
Oso	8	231	3,252	93,800
Pearblossom	9	540	2,575	203,200
Greenspot	4	382	50	3,900
Crafton Hills	3	613	40	4,000
Cherry Valley	2	130	75	300

<sup>a</sup>The term p-g indicates pumping-generating units.

<sup>b</sup>These plants have one unit in reserve.



**Table 1-4 Power Plant Characteristics, by Type and Facility**

Type and Facility	Number of Units	Normal Static Head (feet)	Total Flow at Design Head (cfs)	Net Dependable Capacity (MW)	Nameplate Capacity (MW)
<b>Hydro</b>					
Thermalito Diversion Dam	1	63-77	615	3	3
Robie Thermalito	4 (3 p-g) <sup>a</sup>	85-102	17,400	114	114
Hyatt	6 (3 p-g) <sup>a</sup>	410-676	16,950	645	645
Gianelli (total)	8 p-g <sup>a</sup>	99-327	16,960	363	424
Alamo	1	115-141	1,740	15	17
Warne	2	719-739	1,600	67	74
Mojave Siphon	3	81-136	2,880	29	30
Devil Canyon	4	1,406	2,940	235	276
Castaic <sup>d</sup>	7 (6 p-g) <sup>a</sup>	900-1,050	20,820	1,128	1,254
<b>Coal</b>					
Reid Gardner, Unit 4 (total) SWP share of generation <sup>c</sup>	1 <sup>b</sup>			234	275

<sup>a</sup> The term p-g indicates pumping-generating units.

<sup>b</sup> Life of the plants is expected to extend through 2013.

<sup>c</sup> SWP ownership share in Reid Gardner, Unit 4, is 67.8%.

<sup>d</sup> Castaic Pumping-Generating Plant is owned and operated by the Los Angeles Department of Water and Power.

**Table 1-5 Total Miles of Aqueducts**

Facility	Channel and Reservoir	Canal and Siphon	Pipeline and Discharge Line	Tunnel	Total
Grizzly Valley Pipeline	0.0	0.0	6.0	0.0	6.0
Thermalito Power Canal and Tail Channel	1.5	1.9	0.0	0.0	3.4
North Bay Aqueduct	0.0	0.0	27.6	0.0	27.6
South Bay Aqueduct (including Del Valle Branch)	0.3	10.7	31.9	1.7	44.6
<i>Subtotal</i>	<i>1.8</i>	<i>12.6</i>	<i>65.5</i>	<i>1.7</i>	<i>81.6</i>
California Aqueduct					
Clifton Court Forebay to O'Neill Forebay	4.5	61.9	0.3	0.0	66.7
O'Neill Forebay to Kettleman City	4.1	101.4	0.2	0.0	105.7
Kettleman City to Edmonston Pumping Plant	0.0	120.1	0.9	0.0	121.0
Edmonston Pumping Plant to Tehachapi Afterbay	0.0	0.2	1.9	7.9	10.0
Tehachapi Afterbay to Lake Perris	4.0	97.8	34.3	3.9	140.0
<i>Subtotal</i>	<i>12.6</i>	<i>381.4</i>	<i>37.6</i>	<i>11.8</i>	<i>443.4</i>
California Aqueduct Branches					
Coastal Branch	0.0	14.1	98.7	2.7	115.5
West Branch	9.7	9.3	5.8	7.1	31.9
East Branch Extension					
Devil Canyon Powerplant to Greenspot Pump Station	0.0	0.0	16.2	0.0	16.2
Greenspot Pump Station to Noble Creek Terminus	0.0	0.0	16.4	0.0	16.4
<i>Subtotal</i>	<i>9.7</i>	<i>23.4</i>	<i>137.1</i>	<i>9.8</i>	<i>180.0</i>
<b>Total</b>	<b>24.1</b>	<b>417.4</b>	<b>240.2</b>	<b>23.3</b>	<b>705.0</b>

risks and effects of climate change on California's water resources. The team will regularly update decision makers on climate change impacts, the ability of existing facilities to accommodate these impacts, and available mitigation measures.

In response to changes brought about by population growth, environmental concerns, climate change, and other factors, DWR continues to plan, design, and construct transportation and power-producing facilities for the SWP.

For more information about current SWP planning and construction, see Chapter 12, Engineering, Construction, and Real Estate. Information about prior construction activities can be found in previous issues of Bulletin 132.

## Methods of Financing

Project facilities have been constructed with several general types of financing: general obligation bonds and tideland oil revenues (under the Burns-Porter Act, which was approved by the Legislature in 1959, and the bond issue approved by voters in 1960); revenue bonds; and capital resources revenues. Repayment of these funds, and the operations, maintenance, power, and replacement costs associated with water supply, are paid by the 29 agencies and districts that have long-term contracts with DWR for the delivery of SWP water.

## Long-term Contracting Agencies

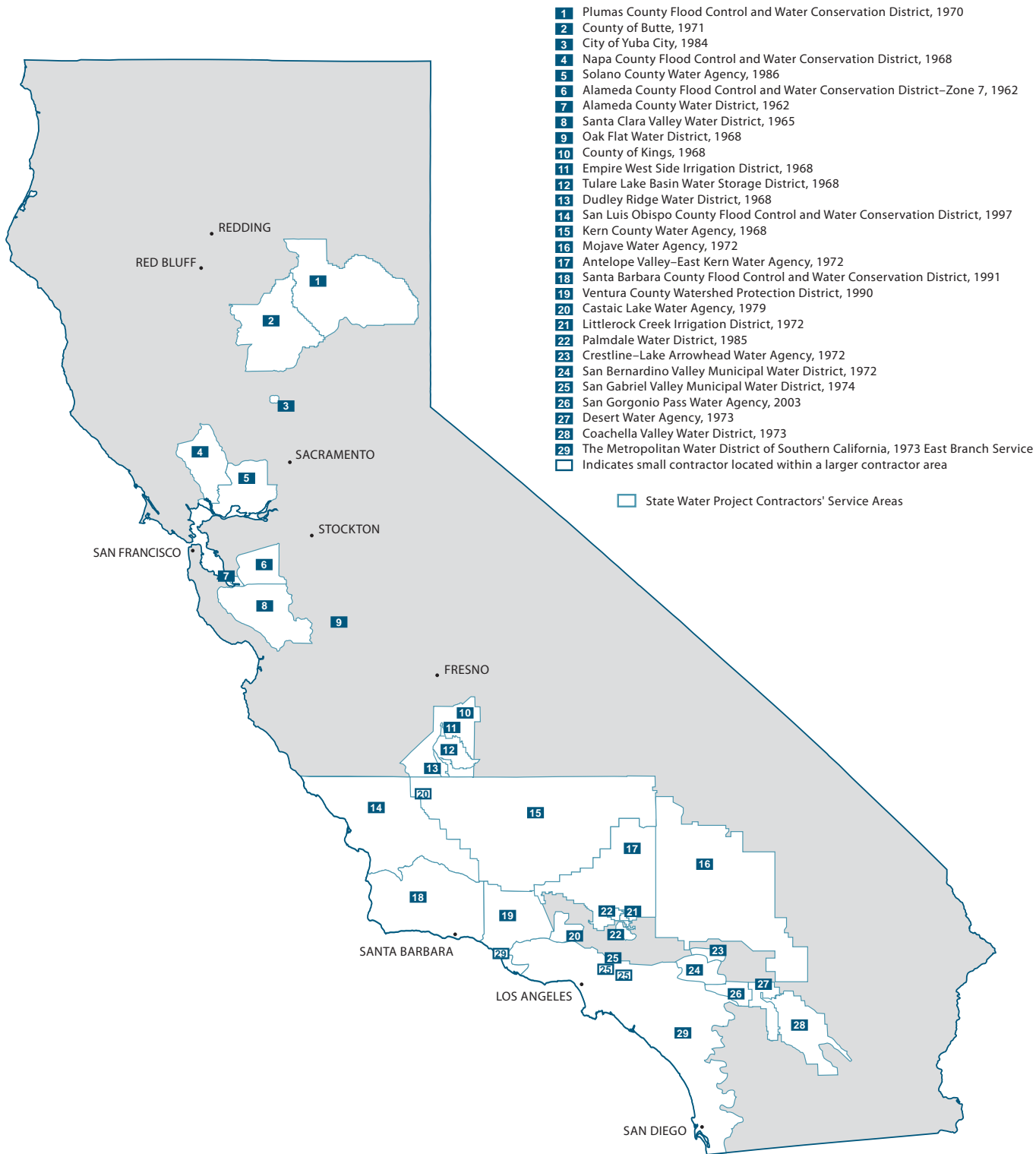
From 1963 through 1967, 32 agencies or districts signed long-term water supply contracts with DWR. However, in 1965, the City of West Covina was annexed to The Metropolitan Water District of Southern California, and in 1981, Hacienda Water District was assigned to Tulare Lake Basin Water Storage District. On January 1, 1992,

Castaic Lake Water Agency assumed all rights and obligations granted to Devil's Den Water District in accordance with its long-term water supply contract. Therefore, only 29 agencies and districts have long-term contracts with DWR as of December 31, 2012.

The contracts initially provided for a combined maximum annual Table A amount of 4,230,000 af of water supply. As a result of contract amendments in the 1980s, and the Monterey Amendment, the current combined maximum annual Table A amount by 2016 totals 4,172,786 af (see Appendix B, Table B-4 for details). The contracts are in effect for the longest of the following periods:

- the project repayment period, which extends to the year 2035;
- 75 years from the date of the contract; or
- the period ending with the latest maturity date of any bond used to finance the construction costs of project facilities.

Figure 1-2 shows the name and location of each contracting agency and district and lists the first year of SWP delivery service for each. Table 1-6 presents more detailed information about each contracting agency.



**Figure 1-2 Names, Locations, and First Year of Service of Long-term Contracting Agencies, December 31, 2012**

**Table 1-6 Long-term Water Supply Contracting Agencies, by Area, as of December 31, 2012**

Contracting Agency	Cumulative Deliveries (af) <sup>a</sup>	Annual Table A (af)	Payments (in dollars) <sup>b</sup>	Gross Area (acres)	Assessed Valuation (in dollars) <sup>b</sup>	Estimated Population
<b>Upper Feather River Area</b>						
City of Yuba City	36,187	9,600	6,302,090	9,332	4,400,000,000	63,338
County of Butte	53,525	27,500	4,550,013	1,049,280	17,891,000,000	221,609
Plumas County Flood Control and WCD	12,464	2,320	1,987,717	1,676,056 <sup>c</sup>	2,060,744,342	21,200
<i>Subtotal</i>	<i>102,176</i>	<i>39,420</i>	<i>12,839,820</i>	<i>2,734,668</i>	<i>24,351,744,342</i>	<i>306,147</i>
<b>North Bay Area</b>						
Napa County Flood Control and WCD	300,706	29,025	109,405,500	510,010	27,972,678,085	139,045
Solano County Water Agency	767,628	47,606	145,872,474	581,760	38,800,000,000	415,913
<i>Subtotal</i>	<i>1,068,334</i>	<i>76,631</i>	<i>255,277,974</i>	<i>1,091,770</i>	<i>66,772,678,085</i>	<i>554,958</i>
<b>South Bay Area</b>						
Alameda County Flood Control and WCD–Zone 7	1,509,555	80,619	220,617,145	275,900	39,514,000,000	224,000
Alameda County WD	1,254,160	42,000	125,717,638	67,200	46,053,748,000	331,000
Santa Clara Valley WD	3,980,791	100,000	377,322,234	849,000	299,096,733,565	1,781,642
<i>Subtotal</i>	<i>6,744,506</i>	<i>222,619</i>	<i>723,657,017</i>	<i>1,192,100</i>	<i>384,664,481,565</i>	<i>2,336,642</i>
<b>San Joaquin Valley Area</b>						
County of Kings	144,376	9,305	9,007,967	893,300	8,930,335,305	150,843
Castaic Lake Water Agency <sup>d</sup>	471,637			8,700 <sup>e</sup>	4,532,936	0
Dudley Ridge WD	2,293,825	50,343	91,305,841	37,600	87,100,000	36
Empire West Side Irrigation District	121,252	3,000	4,506,441	7,400		11
Kern County Water Agency	35,089,726	982,730	2,027,250,847	5,224,000	90,300,000,000	851,710
Oak Flat WD	208,748	5,700	7,218,050	4,500		10
Tulare Lake Basin Water Storage District	4,881,518	88,922	177,348,739	189,519	180,000,000	23
<i>Subtotal</i>	<i>43,211,082</i>	<i>1,140,000</i>	<i>2,316,637,885</i>	<i>6,365,019</i>	<i>99,501,968,241</i>	<i>1,002,633</i>
<b>Central Coastal Area</b>						
San Luis Obispo County Flood Control and WCD	71,643	25,000	88,026,380	2,122,240	38,119,799,087	274,804
Santa Barbara County Flood Control and WCD	333,991	45,486	583,619,550	193,391	26,935,170,063	381,562
<i>Subtotal</i>	<i>405,634</i>	<i>70,486</i>	<i>671,645,930</i>	<i>2,315,631</i>	<i>65,054,969,150</i>	<i>656,366</i>
<b>Southern California Area</b>						
Antelope Valley-East Kern Water Agency	1,999,110	141,400	530,816,049	1,525,547	22,507,541,567	312,383
Castaic Lake Water Agency	938,328	95,200	329,049,828	124,800	31,665,229,726	272,200
Coachella Valley WD	1,307,022	138,350	452,558,959	639,857	49,296,585,164	303,846
Crestline-Lake Arrowhead Water Agency	56,264	5,800	27,042,485	54,777	2,400,000,000	23,413
Desert Water Agency	1,247,113	55,750	292,047,209	209,760	7,495,720,000	72,000
Little Rock Creek Irrigation District	21,937	2,300	6,797,761	10,000	372,988,910	2,900
The Metropolitan WD of Southern California	34,828,783	1,911,500	10,563,758,882	3,314,630 <sup>f</sup>	2,097,369,921,305	18,202,432
Mojave Water Agency	364,315	82,800	289,227,279	3,118,720	27,400,114,225	458,897
Palmdale WD	262,566	21,300	84,067,158	119,680	1,414,494,581	114,533
San Bernardino Valley Municipal WD	907,926	102,600	616,638,423	225,577	25,919,633,633	661,546
San Gabriel Valley Municipal WD	407,438	28,800	163,059,344	18,297	16,850,589,207	197,636
San Geronio Pass Water Agency	49,986	17,300	142,445,195	140,800	5,708,130,719	78,268
Ventura County Watershed Protection District	65,921	20,000	64,529,705	308,252	25,483,476,833	464,600
<i>Subtotal</i>	<i>42,456,709</i>	<i>2,623,100</i>	<i>13,562,038,277</i>	<i>9,810,697</i>	<i>2,313,884,425,870</i>	<i>21,164,654</i>
<b>Total</b>	<b>93,988,441</b>	<b>4,172,256</b>	<b>17,542,096,903</b>	<b>23,509,885<sup>g</sup></b>	<b>2,954,230,267,253</b>	<b>26,021,400</b>

<sup>a</sup> All water delivered to long-term SWP contractors, including carryover, Article 21, surplus, unscheduled, exchange, permit, purchased, local, and non-SWP water.  
<sup>b</sup> Statutes of 1978, Chapter 1207, added Section 135 to the Revenue and Taxation Code, requiring assessment at 100% of full value for the 1981–1982 fiscal year and fiscal years thereafter.  
<sup>c</sup> Total of all Plumas County Flood Control and Water Conservation District, including Last Chance Creek Water District.  
<sup>d</sup> Assessed valuation not available on an agency area breakdown.  
<sup>e</sup> Castaic Lake Water Agency (Southern California Area) includes land in the San Joaquin Valley Area formerly known as Devil's Den Water District.  
<sup>f</sup> Total for Metropolitan, including Calleguas Municipal Water District, which is common to Metropolitan and Ventura County Watershed Protection District.  
<sup>g</sup> Includes duplicate values. Some areas that are within two or more agencies are included in each agency's total.  
<sup>h</sup> Includes all payments pursuant to the repayment provisions of the Water Supply Contracts. Historic Transportation and Conservation Replacement Accounting System payments are included in this table for the first time and will be included going forward.  
<sup>i</sup> Formerly Devil's Den Water District. Castaic Lake Water Agency acquired Devil's Den Water District's Table A allocation in 1992.



## Chapter 2 Delta Resources

*Pelicans and egrets frolic in the Suisun Marsh.*



## Significant Events in 2012

The final draft *Delta Plan* and the associated recirculated draft programmatic environmental impact report and notice of proposed rulemaking were released on November 30, 2012.

*Information for this chapter was contributed by the FloodSAFE Environmental Stewardship and Statewide Resources Office, the Bay-Delta Office, and the Division of Flood Management.*

The Sacramento-San Joaquin Delta is a unique environmental resource and a major source of water for millions of Californians. Over the past 40 years, the Department of Water Resources (DWR) and other State and federal agencies have developed and implemented numerous programs to manage the Delta.

## Delta Water Management Programs

Future water deliveries to millions of Californians throughout the State will be affected by many factors, including two significant changes: Delta pumping restrictions and climate change. Ongoing planning activities and regulatory actions continue to influence DWR activities in the Delta. As a result of the efforts associated with the Bay Delta Conservation Plan (BDCP) and the Delta Stewardship Council (DSC) *Delta Plan*, many of DWR's proposed projects were suspended as staff was redirected to work on the State Water Project (SWP) Delta Compliance Program.

### BDCP

The BDCP is being developed in compliance with the federal Endangered Species Act (ESA) and the California Natural Community Conservation Planning Act. When complete, the BDCP will provide the basis for the issuance of endangered species permits for the operation of the State and federal water projects. The plan will be implemented over the next 50 years. The heart of the BDCP is a long-term conservation strategy that sets forth actions needed for a healthy Delta.

For more information regarding BDCP, see Chapter 3, Environmental Programs.

### Delta Plan

The Delta Reform Act of 2009 requires the DSC to adopt a comprehensive, long-term management plan for the Delta (*Delta Plan*).

(For more information, see the sidebar, Delta Stewardship Council.) Additionally, the Delta Reform Act provides that when the BDCP is completed and successfully permitted, it will be incorporated into the *Delta Plan*.

Over an 18-month period, the *Delta Plan* process went through seven drafts, a draft programmatic environmental impact report (EIR), and numerous public meetings and responses to public comments on the drafts.

On November 30, 2012, the final draft *Delta Plan* was posted to the DSC's website, concurrent with the release of the recirculated draft programmatic EIR and draft rulemaking package for public review and comment.

For more information regarding the *Delta Plan*, visit the DSC's website.

## State Water Project Delta Compliance Program

The SWP and Central Valley Project (CVP) obtained take authorization for ESA and California Endangered Species Act listed species for coordinated operations in the Delta through a U.S. Fish and Wildlife Service biological opinion (BO) for Delta Smelt in December 2008, a Department of Fish and Wildlife incidental take permit for Longfin Smelt in February 2009, and a National Marine Fisheries Service (NOAA Fisheries) BO for salmon, steelhead, and Green Sturgeon in June 2009. Some of the requirements in these documents were implemented right away, while other

## Delta Stewardship Council

Created by the Legislature under the Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act), the Delta Stewardship Council (DSC) is an independent agency of the State of California composed of members who represent different parts of the State and offer diverse expertise in fields such as agriculture, science, the environment, and public service. Of the seven members, four are appointed by the Governor, one each is appointed by the Senate and Assembly, and the seventh is the Chair of the Delta Protection Commission. The council is the successor to the California Bay-Delta Authority and assumes all of its administrative rights, abilities, obligations, and duties.

The DSC is mandated by law to develop, adopt, and begin implementing a legally enforceable, comprehensive, long-term management plan for the Sacramento-San Joaquin Delta by January 1, 2012. The *Delta Plan* will establish a set of integrated, legally enforceable policies, strategies, and actions to guide State and local agencies to help achieve the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. It will also guide protection and enhancement of the unique resources, culture, and values of the Delta as an evolving place (California Water Code Section 85054).

The Delta Reform Act also specifies eight policy objectives that are “inherent” in the coequal goals (see Water Code Section 85020); a related statewide policy to reduce reliance on the Delta in meeting the State’s future water supply needs through improved regional water self-reliance (Water Code Section 85021); and certain specific subjects and strategies that must be included in the Delta Plan (see generally, Water Code Sections 85301–85309).

The Delta Reform Act also established the Delta Science Program and Delta Independent Science Board (ISB) to provide the scientific support and oversight the DSC needs to make decisions based on sound science. Members of both are appointed by the DSC. The Delta Science Program replaces the CALFED Science Program, and the Delta ISB replaces the CALFED ISB.

The Delta Science Program will develop scientific information and synthesis on issues critical for managing the Bay-Delta system. That body of knowledge must be unbiased, relevant, authoritative, integrated across State and federal agencies, and communicated to Bay-Delta decision-makers, agency managers, stakeholders, the scientific community, and the public.

The Delta ISB is a standing board of nationally and internationally prominent scientists with appropriate expertise to evaluate the broad range of scientific programs that support adaptive management of the Delta. The Delta ISB will provide oversight of the scientific research, monitoring, and assessment programs that support adaptive management of the Delta through periodic reviews of each of those programs. The overall objective of Delta ISB oversight is to ensure that the science supporting Bay-Delta programs, the application of that science, and the technical aspects of the Bay-Delta programs are optimally developed and implemented.



requirements needed development of studies and projects before being implemented.

In 2012, as efforts moved forward in developing long-term Delta plans, ongoing efforts under the SWP Delta Compliance Program were underway to develop studies and projects to address regulatory requirements under the NOAA Fisheries and U.S. Fish and Wildlife Service BOs and Department of Fish and Wildlife incidental take permit.

## Predation Reduction Efficiency Program

This program includes improving existing fish salvage release sites, developing additional fish salvage release sites, developing a fishing facility and associated predation study for Clifton Court Forebay, and evaluating the screening efficiency of the Skinner Fish Facility to comply with the requirements under the BOs and incidental take permit. These requirements include:

- reducing prescreen loss of ESA protected salmon and steelhead in Clifton Court Forebay to no more than 40 percent;
- reducing predation by 50 percent at the fish release sites;
- implementing fish release site studies to develop methods to reduce predation following release of salvaged fish; and
- identifying salvage deficiencies and recommending actions to improve salvage efficiency in order to meet a required efficiency goal of 75 percent for salmonids.

The addition of the Fish Science Building at the Skinner Fish Facility is essential as the current collection, handling, transport, and release building is too small and lacks the necessary equipment to hold and rear the fish to carry out various studies and projects. The building will include a small laboratory, fish rearing tanks, an office, and an area to store study gear and equipment. Additional

fish rearing tanks will be located outside the building along with a water treatment system. During 2012, the environmental documentation, permitting, plans, and specifications for the Fish Science Building were completed, and the project advertised for bids to commence construction in 2013.

## Fish Salvage Release Sites

The predation reduction strategy for the release sites includes designing and constructing the Curtis Landing fish release site with minimal in-water structure to reduce predation and improve survival of released salvaged fish, building two new sites to increase the time between releases at each site, and coordinating interagency use of release sites. During 2012, geotechnical investigations, permitting, and environmental documentation were initiated for the Curtis Landing fish release site improvements, while similar efforts were being planned for the new fish release sites.

## Clifton Court Forebay

The predation reduction strategy in the Clifton Court Forebay is to increase fishing pressure on predators by constructing a fishing pier to provide improved access for anglers that will result in reduced prescreen loss of ESA protected salmon and steelhead in forebay. During 2012, a feasibility level study for the Clifton Court Forebay fishing facility was completed along with an issue paper that provides the project's history, initiation, objectives, description, ongoing activities, and issues being faced to complete the project on time, and recommendations on resolving some of these issues. In addition, a predator study was designed to gather as much information as possible, pre- and post-installation of the proposed fishing facility, to allow the behavior and population demographics of predatory fish and birds and salmonid survival to be more thoroughly documented.

### Skinner Fish Facility

The strategy for evaluating the screening efficiency of the Skinner Fish Facility includes evaluating:

- fish losses through the primary louvers, secondary louvers, and holding tanks;
- hydraulics within the facility;
- the relative abundance of predators within the primary louver channels; and
- fish behavior and movement patterns as they are entrained and guided through the facility.

During 2012, releases of tagged fish were completed at the facility to improve preliminary estimates of salvage efficiency for late fall-run (as a surrogate for winter-run) Chinook Salmon and to refine study methods for a full-scale evaluation.

### Fish Screen Evaluations

Fish screens at Barker Slough Pumping Plant, Roaring River Slough Distribution System, and diversions around Sherman Island will be evaluated in order to comply with the requirements of the BOs and the incidental take permit. The evaluations consist of four components:

- underwater site inspection;
- fish screen cleanliness evaluation;
- fish screen hydraulic evaluation; and
- fish entrainment and impingement evaluation.

These components determine if facility structural components are in sufficient condition to perform as designed, the effectiveness of fish screen cleaning practices, water approach velocities for various screen cleanliness conditions, and entrainment and impingement for various combinations of fish presence, pumping rates, time of day, and time of year. During 2012, draft work plans for the Sherman Island, North Bay Aqueduct, and Roaring

River Slough Distribution System fish screen evaluations were completed, and approval was granted by the regulatory agencies to conduct a pilot study. Obtaining necessary permits, resources, and funding was initiated to start work in 2013.

### Ad Hoc Studies

In January 2012, a joint stipulation was filed in the consolidated salmonid cases litigation regarding the 2009 NOAA Fisheries BO. The 2012 Stipulation Study was undertaken to gain more information about the effects of CVP and SWP export operations on juvenile steelhead and fall-run Chinook Salmon, gain a better understanding of the effect of Old River and Middle River reverse flows on steelhead route selection and survival in the South Delta, and pilot an approach to manage water export risks to ESA listed salmonids. This study was intended to comply with the requirements of a court settlement agreement that would support evaluation of the BO reasonable and prudent alternative Action IV.2.1, limiting south Sacramento-San Joaquin Delta exports during April and May, as a function of San Joaquin River flows. The study was successfully completed and utilized real-time data to inform in-season management and water operations. Analysis of the results is expected in 2013.

Additional information about CVP/SWP operations related to the BOs can be found in Chapter 3, Environmental Programs.

### Delta Knowledge Improvement Program

In response to Assembly Bill 1200 (2005), which required DWR to provide a risk analysis of the Delta and Suisun Marsh and to develop a set of improvement strategies to manage those risks, DWR created the Delta Risk Management Strategy to look at the sustainability of the Delta and assess major risks to Delta resources from floods,

seepage, subsidence, and earthquakes (see Bulletin 132-08 through 132-12). The Delta Risk Management Strategy also evaluated the consequences of these risks and developed recommendations to manage them. This risk analysis was conducted using available information. The study was generally not involved in collecting new data or evaluating the quality of existing information.

During the course of the Delta Risk Management Strategy project, a number of information gaps or information quality issues were identified. The limited amount of quality information prompted the creation of the Delta Knowledge Improvement Program, a vehicle to actively fund specific studies to fill the data gaps identified in the Delta Risk Management Strategy project.

More information about the Delta Knowledge Improvement Program is available on DWR's website.

## North Delta Flood Control and Ecosystem Restoration Project

The North Delta Flood Control and Ecosystem Restoration Project (NDFCERP) will provide flood control improvements and ecosystem restoration in the North Delta. The project will implement important flood control improvements in the area of the North Delta where the Mokelumne River, Cosumnes River, Dry Creek, and Morrison Creek converge (see Figure 2-1). Flood flows in the area threaten levees, bridges, and roadways when levees on McCormack-Williamson Tract (MWT) are overtopped and a flood surge occurs. The proposed project will help regulate peak flood flows and prevent flood surges. It will also provide substantial aquatic and terrestrial habitat benefits.

The final NDFCERP EIR was certified in November 2010 and recommended the implementation of the preferred alternative (Alternative 1-A for the Group I actions and the No Action Alternative for the Group II actions [see Bulletin 132-11]). The project will create tidal, subtidal, aquatic, and terrestrial habitats benefiting a number of special status species such as Sacramento Splittail and Chinook Salmon. The project, as proposed, will provide contiguous habitat and a riparian corridor from the downstream portion of the Cosumnes River Preserve to the Delta.

The following project elements are proposed for implementation over a 6-year timeline: the MWT element combines North Delta flood surge reduction measures with the construction of habitat-friendly levees, floodplain restoration, and the creation of freshwater tidal habitat on MWT. The MWT property, purchased using a CALFED grant, is currently owned and managed by The Nature Conservancy. When completed, the MWT element will result in nearly 1,500 acres of tidal marsh and floodplain restoration, consistent with the objectives put forth in the evolving *Delta Plan* and BDCP. The Grizzly Slough element consists of breaching the Grizzly Slough and Bear Slough levees upstream of MWT to help attenuate peak flood flows and maximize nearly 500 acres of floodplain habitat on the DWR-owned property.

### Project Status

In 2010 and 2011, the U.S. Army Corps of Engineers' CALFED Levee Stability Program renewed its interest in the flood control and ecosystem restoration actions proposed for MWT (a component of the NDFCERP) and requested funding for a federal cost-share agreement for MWT final project planning and design. In June 2012, the U.S. Army Corps of Engineers received approval to execute the federal cost-share agreement with Reclamation District 2110. However,

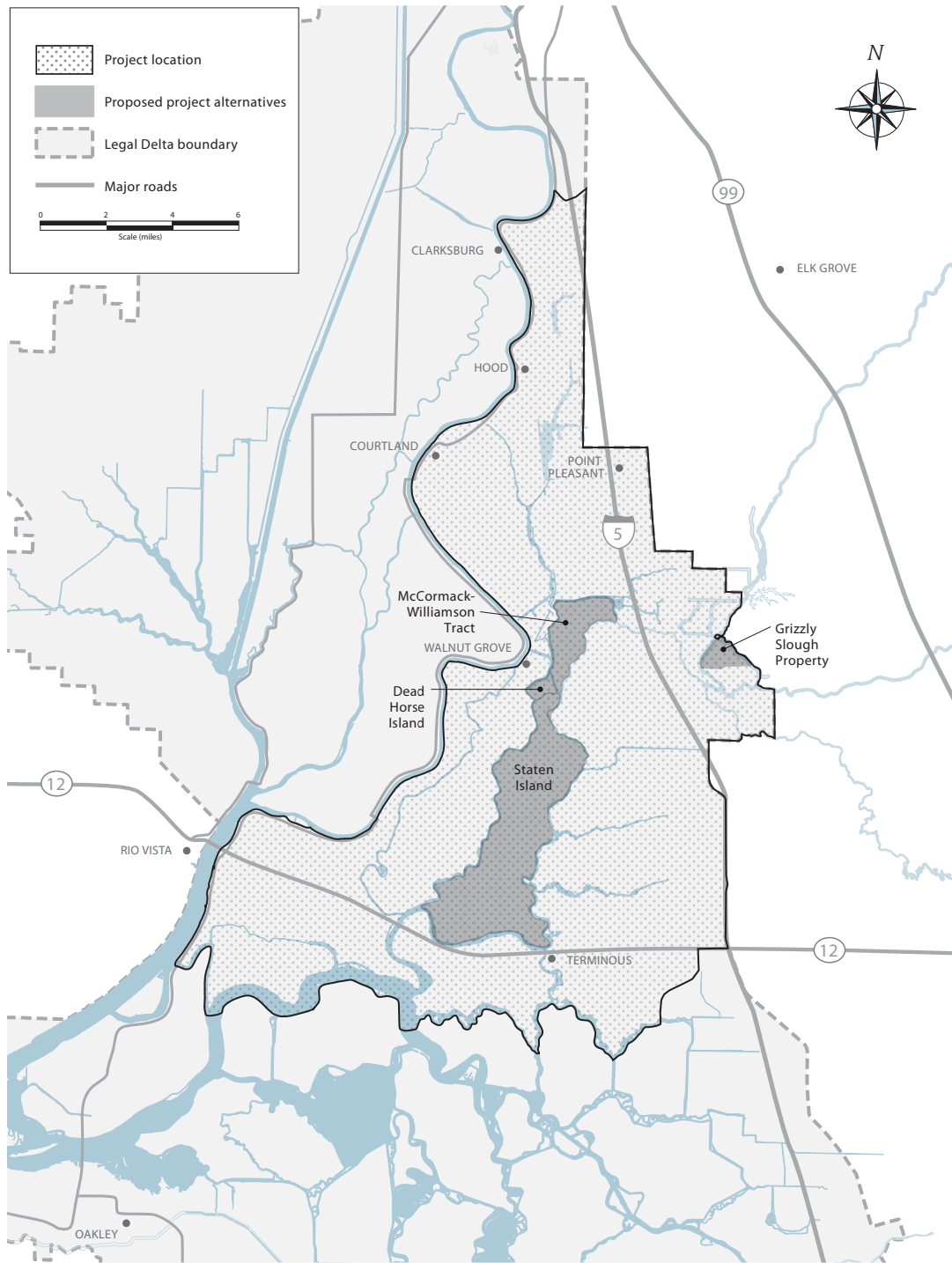


Figure 2-1 North Delta Flood Control and Ecosystem Restoration Project, Project Area



due to uncertainty in a federal funding commitment for project construction, a decision was made to pursue a possible cost-share with the State and Federal Contractors Water Agency (SFCWA). SFCWA is interested in the project for potential credit toward meeting the requirements of the BOs for long-term operations of the CVP and SWP. In late 2012, DWR and SFCWA began to work jointly on a crediting prospectus to submit to the Fishery Agency Strategy Team. DWR staff investigated how to expedite the project by reviewing the draft costs, levee design and fill options, hydrologic modeling, and permitting tasks that supported the EIR.

## South Delta Improvements Program

In 1999, the South Delta facilities became a key component of CALFED.

South Delta Improvements Program (SDIP) elements in the CALFED record of decision included increasing diversions through Clifton Court Forebay (first to 8,500 cubic feet per second [cfs] and then to 10,300 cfs), dredging and installing operable tidal barriers in the South Delta, installing a fish barrier at Head of Old River, and constructing the first phase of a new intake and fish screen in Clifton Court Forebay. SDIP is proposed to be implemented in two component stages.

DWR and the Bureau of Reclamation (Reclamation) identified the following SDIP project objectives and purposes:

- reducing movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via Old River (SDIP Stage 1);
- maintaining adequate water levels and water quality through improved circulation for agricultural diversions in the South Delta, downstream of Head of Old River (SDIP Stage 1);

- increasing water deliveries and delivery reliability to SWP and CVP water contractors south of the Delta (SDIP Stage 2); and
- providing opportunities to convey water for fish and wildlife purposes by increasing the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay to 8,500 cfs (SDIP Stage 2).

The SDIP Stage 1 physical/structural component includes the following elements:

- constructing and operating a fish-control gate at Head of Old River to reduce downstream movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via the Head of Old River;
- constructing and operating up to three flow-control structures (gates) at Middle River (near the confluence of Middle River with Victoria Canal); Grant Line Canal (near the confluence of Grant Line Canal and Old River); and Old River (just east of the Delta-Mendota Canal intake) to improve existing water level and circulation patterns in South Delta water channels;
- dredging various channels in the South Delta, including Middle and Old rivers, to improve conveyance; and dredging areas surrounding agricultural diversions to improve their function; and
- extending up to 24 agricultural diversion intake facilities to improve their function.

The SDIP final EIR/environmental impact statement (2006) determined the preferred alternative for SDIP Stage 1, which entails installation of permanent control gates to replace the temporary rock barriers currently installed and removed each year under the DWR Temporary Barriers Project. The preferred alternative also includes the elements of dredging and extending agricultural diversions.

## Preferred Plan

The preferred plan for SDIP is to construct the physical/structural component as soon as permits are obtained and defer the operational component until more is known about the project's potential effects on Delta Smelt and other protected fish species.

DWR deferred both the increase in diversions of up to 10,300 cfs and the associated new fish screens as components of the SDIP due to major funding issues as well as significant technical uncertainties associated with the design and construction of the new fish screens.

## Program Status

DWR and Reclamation continued to suspend most SDIP planning and permitting activities during 2012. Some activities were undertaken to address requirements of the 2009 NOAA Fisheries BO for the CVP and SWP Long-term Operations Criteria and Plan.

Discussions between DWR and NOAA Fisheries revealed NOAA Fisheries' concern for potential barrier hydraulic disturbances that could promote increased predation on juvenile salmon. DWR conducted a hydrodynamic study focusing on barrier design features to minimize these disturbances. A study report was submitted to NOAA Fisheries in April 2010, which identified several features that could be incorporated into the design.

NOAA Fisheries stated an interest to hold off further discussions on the SDIP until completion of an ongoing, multiyear South Delta Temporary Barriers Project predation study. The study is being conducted to satisfy requirements of the 2008 NOAA Fisheries BO for the project and is examining the occurrence of predation associated with the project. The study's field data collection was completed in 2011, and data analysis is in progress. Data from the study will be useful in considering permanent barrier

design options and operation strategies to minimize predation.

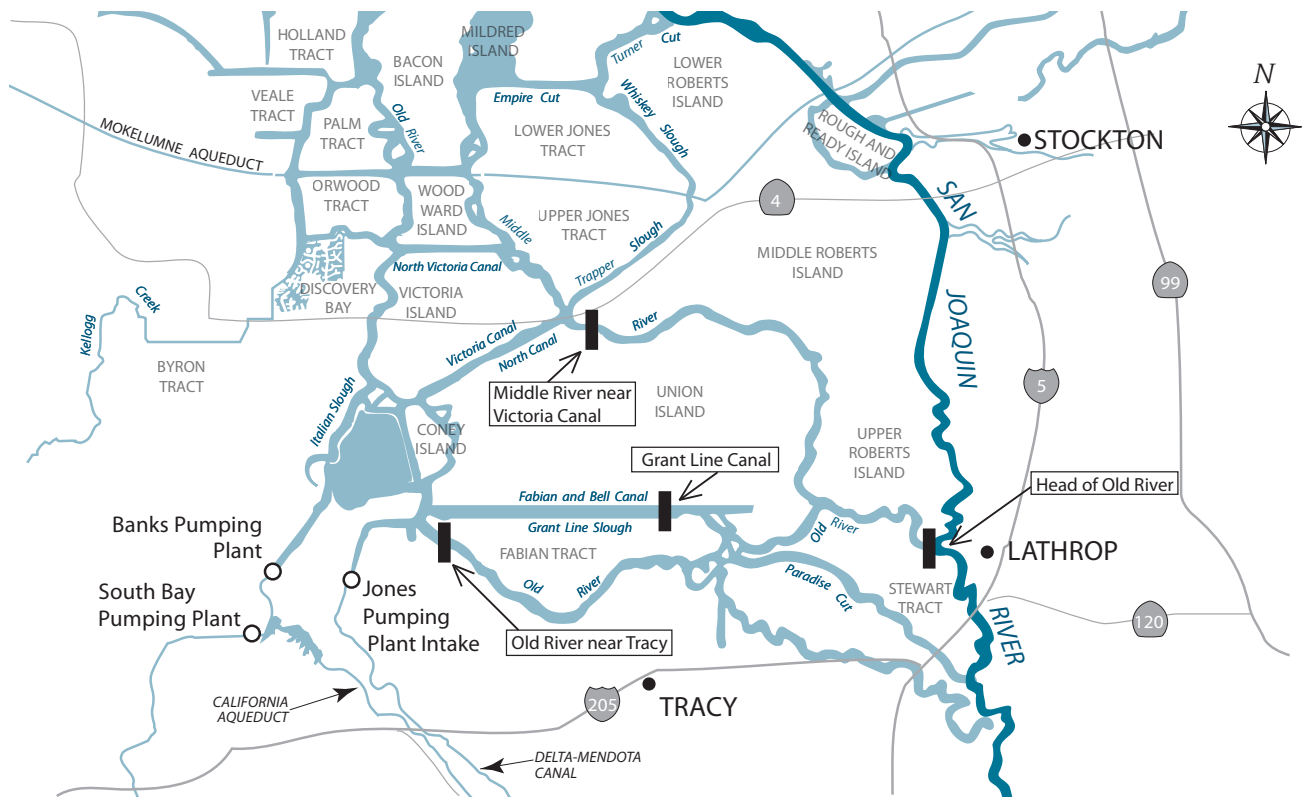
For additional information about SDIP, see Chapter 7, Water Supply Development and Reliability.

## Temporary Barriers Project Facilities

The South Delta Temporary Barriers Project is an ongoing project that installs up to four rock barriers in channels located in the southern portion of the Sacramento-San Joaquin Delta near the cities of Tracy and Lathrop in San Joaquin County. The barriers are installed during the irrigation season from April to November at four sites (see Figure 2-2), as follows:

- (1) Head of Old River, in Old River where it splits from the San Joaquin River;
- (2) Old River near Tracy, one-half mile east of the Jones Pumping Plant intake and about 8 miles northwest of Tracy;
- (3) Middle River near Victoria Canal, just southeast of the confluence of Middle River, Trapper Slough, and North Canal; and
- (4) Grant Line Canal, 420 feet east of the Tracy Boulevard Bridge.

The Old River near Tracy, Middle River near Victoria Canal, and Grant Line Canal rock barriers are designed to act as flow-control structures to improve water levels and circulation within the South Delta. The Head of Old River barrier is designed to improve migration conditions for Central Valley fall-run Chinook Salmon in the spring and fall. In the spring, the barrier blocks juvenile salmon migratory movements into Old River from the mainstream San Joaquin River. In the fall, the barrier increases the volume of San Joaquin River flow passing downstream through the Port of Stockton and improves dissolved oxygen levels in the San Joaquin River. As a result, it improves the low dissolved oxygen sag that occurs near



**Figure 2-2 Temporary Barrier Locations in the South Delta**

that area and aids adult salmon upstream migration in the San Joaquin River basin.

In 2012, the three agricultural barriers at Middle River near Victoria Canal, Grant Line Canal, and Old River near Tracy were installed and operated as planned. The spring Head of Old River rock barrier was installed and operated with eight 48-inch diameter culverts equipped with sliding gates on the upstream side of the barrier. The culverts were to remain open at all times unless otherwise directed by the regulatory agencies. In past seasons, there were six culverts installed. The number of culverts was increased to eight and the culverts' inlet was open at all times to introduce more flow into Old River to mitigate for the reverse flow caused by the pumping plants and to help push the Delta Smelt population northward to help the fish avoid getting trapped in the central Delta. Immediately

after the installation of the spring Head of Old River barrier, coordinated acoustical telemetry studies were being conducted by Reclamation and the U.S. Fish and Wildlife Service to track the movements of salmon smolts, steelhead, and predatory fish to determine the survivability of the outmigrating salmon smolts and to learn more about predatory fish behavior.

In 2012, the fall Head of Old River rock barrier was not installed due to adequate presence of dissolved oxygen in the Stockton Deep Water Ship Channel, and because it was not requested by the Department of Fish and Wildlife.

Data collected is being analyzed, and the findings of the studies will be published in a comprehensive report.

Information on the temporary barriers can be found on DWR's website.

## Delta Flood Control

Many important assets in the Sacramento-San Joaquin Delta are protected from flooding by levees. The levees protect valuable wildlife habitat, farms, homes, urban areas, recreational developments, highways, railroads, natural gas infrastructure, utility lines, a major aqueduct, and other public developments. Some levees are critical to the protection of in-Delta water quality and water quality for approximately 25 million Californians who receive a portion of their water from the Delta. The State Legislature recognized the importance of the Delta and enacted the Delta Flood Protection Act of 1988 (Senate Bill 34 [Water Code Sections 12300 et seq. and 12980 et seq.]). With Senate Bill 34, the Legislature declared that “. . . the Delta is endowed with many invaluable and unique resources and that these resources are of major statewide significance.”

Since 1988, the Delta Levees Program has provided more than \$310 million in State-appropriated funds. These monies, combined with local cost-share funding, have realized more than \$385 million in levee improvements through 2012.

In Senate Bill 34, the Legislature declared its intent to appropriate \$12 million annually for the Delta Levees Program. Of this appropriation, \$6 million was for local assistance under the Delta Levee Maintenance Subventions Program. The remaining \$6 million was for the Delta Levees Special Flood Control Projects, including subsidence studies and monitoring on Bethel, Bradford, Jersey, Sherman, and Twitchell islands; Holland, Hotchkiss, and Webb tracts; and the towns of Thornton and Walnut Grove.

In 1996, Assembly Bill 360 was signed into law expanding the area covered by the Delta Levees Program to include the remainder of the legal Delta and northern Suisun Bay.

Bond appropriations of \$25 million from Proposition 204 (enacted in 1996) and \$30 million from Proposition 13 (enacted in 2000) provided supplemental funding.

In November 2002, Proposition 50 was approved. It provided \$70 million in additional funding to implement the Delta Flood Protection Program as adopted in CALFED, where the program was known as the Levee System Integrity Program.

Proposition 84, approved by voters in November 2006, allocated \$275 million to the Delta for 4 years.

Proposition 1E, also approved by voters in November 2006, added funding for Delta levee improvements.

## CALFED Levee Stability Program

The CALFED Bay-Delta Authorization Act (Public Law 108-361, 2004) authorized the Corps to develop action strategies to address urgent levee improvement needs and identify and prioritize potential short-term and long-term levee stability projects in the Delta.

The CALFED Levee Stability Program is the Corps' short-term strategy to move quickly on high-priority levee reconstruction projects.

The Corps' long-term strategy for Delta levees will be developed in the Sacramento-San Joaquin Delta Islands and Levees Feasibility Study (Delta Study). Under new Corps planning guidelines adopted in 2012 to streamline feasibility level studies, the Corps began a scoping process to limit the focus of the Delta Study. The study will determine the economic feasibility of flood risk reduction and ecosystem restoration projects with the highest potential for implementation.

For additional background information, see Bulletin 132-11.



## Delta Flood Emergency Preparedness, Response, and Recovery Program

The Delta Flood Emergency Preparedness, Response, and Recovery Program is a part of the FloodSAFE California Initiative. The FloodSAFE initiative was developed by DWR in response to the passing of the Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E), which made funding available to enhance disaster preparedness. The program is designed to enhance emergency preparedness and enable DWR to better coordinate with its local partners to respond to and recover from a large-scale Delta flood emergency.

The draft *Delta Emergency Preparedness, Response, and Recovery Plan* presents DWR's concept of operations for flood emergency response in the Delta. The plan describes the roles and responsibilities of DWR's emergency response organizations, including the Flood Operations Center, the Project Operations Center, and the Department Operations Center, and lists DWR's actions during flood emergency response. It also includes information that will assist DWR's flood emergency managers in making critical resource allocation decisions. Supplemental documents provide essential information about the Delta islands to ensure emergency personnel respond efficiently.

For more information, visit DWR's website.

## Delta Levees Maintenance Subventions Program

The Delta Levees Maintenance Subventions Program (Subventions Program) is a cost-share program that provides technical and financial assistance to local levee-maintaining agencies in the Sacramento-San Joaquin Delta for the maintenance and rehabilitation of Delta levees. The Subventions Program is authorized by California Water Code Sections 12980 through 12995 and is managed by DWR.

The Central Valley Flood Protection Board reviews and approves DWR's recommendations and enters into agreements with local agencies to reimburse eligible costs for levee maintenance and rehabilitation.

The Subventions Program provides funding to local levee-maintaining agencies for improving, maintaining, and enhancing nearly 700 miles of project and nonproject levees. Since its inception in 1973, the Subventions Program has provided more than \$160 million of State funding to more than 70 islands in the Sacramento-San Joaquin Delta. In fiscal year 2012–2013, the program reimbursed over \$8 million to 60 local agencies for eligible levee maintenance and rehabilitation activities. These activities helped minimize the risk of Delta levee failure, which in turn protects the Delta's ecosystem, communities, and agriculture; State and private infrastructure; and the State's water supply.

## Delta Special Flood Control Projects Program

The Delta Special Flood Control Projects Program assists the eight western islands, portions of the Suisun Marsh, the towns of Thornton and Walnut Grove, and other locations in the Delta with flood protection and levee stability repairs. The California Water Commission approved a report of initial actions in September 1989, and it approved long-term actions and priorities in May 1990. The long-term actions and priorities serve as a guide for DWR to determine the best use of appropriations to protect these islands. Long-term actions and priorities include the following:

- rehabilitating threatened levees through the beneficial reuse of dredged material;
- verifying elevations in the Delta through the use of global positioning system equipment and light detection and ranging;

- upgrading levees to the standards included in Bulletin 192-82 (Delta Levees Investigation); and
- considering projects to achieve net long-term habitat improvement for fish and wildlife.

While DWR seeks cost sharing for all projects, the actual reimbursement depends on each reclamation district's ability to pay. DWR may provide up to 100 percent of the cost. Districts receiving these funds are required to participate in a habitat improvement program to ensure net long-term habitat enhancement.

Levee restoration projects, habitat projects, and other special projects were conducted on various Delta islands and tracts in 2012.

### Model Bulk Credits Program

In order to more effectively meet reclamation district habitat mitigation obligations resulting from the Delta Levees Subventions and Special Flood Control Projects local assistance, the programs established a model Bulk Credits Program in 2012. Mitigation credits were purchased in advance from an existing mitigation bank. These credits provide more biologically effective mitigation than past practices of establishing less formal, smaller mitigation sites, and are a much more efficient way of meeting mitigation obligations. The bulk purchase of credits from the mitigation bank was made at a substantial discount in price.

### Reuse of Dredged Material for Delta Levees

As local sources of fill material for levee repair are depleted, new economical sources must be located. DWR has worked to find opportunities to reuse clean, dredged materials in the Sacramento-San Joaquin Delta.

As part of this effort, a charter for the multiagency Delta Long-Term Management Strategy (LTMS) for the beneficial reuse of dredged material became effective in February 2007. The LTMS is designed to improve operational efficiency and coordination of collective and individual agency decision-making responsibilities, resulting in approved dredging and dredged material management actions in the Delta, including the beneficial reuse of such materials. Regular LTMS meetings have included representatives from DWR, the Corps, the U.S. Environmental Protection Agency, the Regional Water Quality Control Board (RWQCB), the Ports of Stockton and West Sacramento, and other interested parties. LTMS is evaluating potential beneficial reuse opportunities, particularly from the proposed Sacramento and Stockton Deep Water Ship Channel projects, and has prepared a summary of Delta dredged material placement sites.

To facilitate the permitting process for dredging and dredged material placement and reuse, a draft joint permit application for dredging and dredged material placement/reuse has been developed. An interagency agreement between DWR and the RWQCB was completed in 2012; a sediment background study is underway for Sherman, Twitchell, and Brannan-Andrus islands; and general order waste discharge requirements have been developed to help streamline the RWQCB's approval process.

Delta LTMS long-term goals include the following:

- developing a streamlined permitting process for dredging and dredged material reuse;
- developing a consolidated guidance document addressing sampling, tests, protocols, and methods for assessing sediment and dredged material characterization;

- developing a sediment management plan of methodologies for assessing and characterizing sediments and determining appropriate disposal options;
- developing a programmatic biological assessment for sensitive Delta species;
- drafting a programmatic EIR/ environmental impact statement for the Delta LTMS; and
- identifying and permitting additional sediment placement and beneficial reuse sites in the Delta.

## West Delta Program

The West Delta Program is a part of the Special Investigations branch in the FloodSAFE Environmental Stewardship and Statewide Resources Office with specific SWP-related objectives that include the following:

- effectively manage SWP-owned lands on Sherman and Twitchell islands;
- improve the integrity of local levees;
- implement land-use management techniques to control subsidence, soil erosion, and greenhouse gas production on Sherman and Twitchell islands; and
- provide diverse habitat for wildlife, especially waterfowl.

DWR is a major landowner on Twitchell and Sherman islands and holds two of the three trustee positions for Reclamation Districts 1601 (Twitchell Island) and 341 (Sherman Island). Consequently, DWR, through the West Delta Program, participates in the management and operation of each district, with the goal of improving conditions and accountability. The reclamation districts provide levee maintenance, island drainage, and some internal water supply. These districts assess the landowners for the operational needs of the public districts.

Work continued in 2012 on a greenhouse gas protocol, which is a collaborative effort between DWR, the State Water Contractors, California Air Resources Board, Delta Conservancy, and several research organizations including the University of California, Berkeley. The West Delta Program worked with University of California researchers to construct a new tower that measures greenhouse gas fluxes at the 15-acre wetland research site on Twitchell Island. In addition, work continued with the three existing towers at Mayberry Farms, the corn fields on Twitchell Island, and the rice fields on Twitchell Island. The towers will collect data that will be analyzed by DWR and used to develop future protocols.

## Subsidence Investigations

Subsidence in the Sacramento-San Joaquin Delta marshlands is widely accepted to be caused by local draining and cultivation projects, which cause the peat soil to break down and compact. The peat soil has oxidized and subsided since the mid-1800s when the land was first drained and levees constructed. The surface of organic soils in the Delta is now between 10 and 29 feet below sea level. The Legislature recognized the problem and, with the initiation of the Delta Flood Protection Act of 1988, DWR began monitoring subsidence and studying its causes and the means for reversing its effects. The West Delta Program has been given the task of implementing land-use management techniques to control subsidence and soil erosion on Sherman and Twitchell islands, where the SWP owns approximately 12,500 acres of land.

DWR began a partnership with the University of California, Berkeley, for research on the 15-acre Twitchell Wetlands Research Facility, initially funded in 1999 using CALFED Category III funds. Research activities performed in 2012 by the University of California, Berkeley, include assessments of greenhouse gas release and other impacts of tule cultivation in subsided Delta islands.

Further development of a proposed Farm Scale Wetlands Demonstration Project adjacent to the existing Subsidence Reversal Demonstration Project occurred in 2012, intended to determine the land accretion and carbon sequestration rates associated with wetland farming within the western Delta. Ducks Unlimited was hired by Reclamation District 1601 to assist the West Delta Program with the planning and design of a new approximately 750-acre wetland on eastern Twitchell Island. This new restoration has been referred to as the East End Wetland and has the potential to be similar to the Mayberry Farms project on Sherman Island.

The Mayberry Farms Subsidence Reversal and Carbon Sequestration Project continued to operate as permanently flooded wetlands on a 307-acre parcel on Sherman Island that is owned by DWR (see Figure 2-3). The Mayberry Farms project was conceived as a demonstration project that will provide

subsidence reversal benefits and develop knowledge that can be used by operators of private wetlands, including “duck clubs,” which manage lands for waterfowl-based recreation. Research continued on the greenhouse gas production and sequestration; methylmercury production; and general hydraulic, hydrologic, or water quality projects at the new wetland. The methylmercury research on Mayberry Farms continued in 2012 between West Delta staff and Department of Fish and Wildlife water quality scientists from the Moss Landing laboratory. The parcel is expected to provide year-round wetland habitat for waterfowl and other wildlife.

In addition to tules, rice, a wetland crop with an existing agricultural market, has the potential to accrete land mass and sequester carbon. The Subsidence Mitigation Rice Cultivation Research project continues to determine whether growing rice reverses subsidence, whether it can be grown without

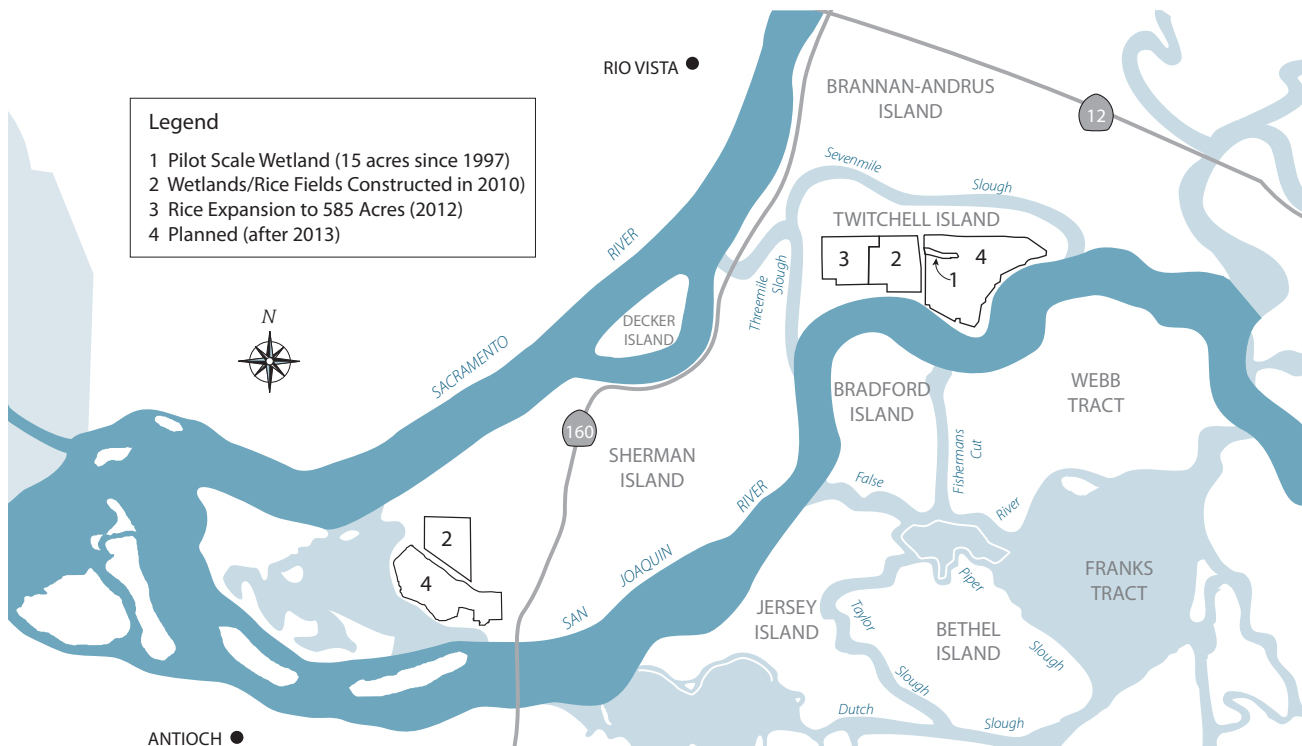


Figure 2-3 Selected West Delta Projects



deleterious effects to the environment, and whether rice is economically feasible in the Delta.

In April 2012, approximately 585 acres of rice were planted on Twitchell Island. Research data from 2009–2010 collected by consultants (University of California, Davis, and the U.S. Geological Survey) showed the rice production stopped subsidence and achieved small amounts of accretion, sequestered atmospheric carbon dioxide, and acted as a sink for methylmercury.

DWR continued to work with the Delta Science Program to develop best management practices to control and reverse subsidence and will work with local districts and landowners to implement cost-effective measures.

For current information related to these projects, please visit DWR's website.

## Delta Agricultural Water Agencies

In 1974, the Delta Water Agency was replaced by six Delta agricultural water agencies: North Delta Water Agency, South Delta Water Agency, Central Delta Water Agency, Contra Costa County Water Agency, East Contra Costa Irrigation District, and Byron-Bethany Irrigation District. In 1981, North Delta Water Agency and East Contra Costa Irrigation District signed water rights management contracts with DWR. DWR negotiated contracts and requested negotiations with other agencies to provide water level, circulation, and quality needs in certain areas.

## South Delta Water Agency Contract

In September 1990, DWR completed negotiations for a long-term agreement with South Delta Water Agency and Reclamation. Under the South Delta Water Agency contract, the parties agreed to proceed with

the design, construction, and operation of certain barrier facilities in the South Delta channels. These facilities resolved portions of the lawsuit that South Delta Water Agency filed in 1982 regarding the alleged effects of export pumping by the SWP and CVP on water levels, quality, and circulation in the South Delta.

DWR has installed and operated temporary barrier facilities in the South Delta to improve area conditions, as well as collect data needed to design and operate permanent barrier facilities. Ongoing efforts are being made to improve water levels, circulation, and quality in South Delta channels. These efforts have included modifying and dredging around local diverters' intakes, conducting a series of computer modeling studies, and modifying barrier flap gate operations.

In 2012, DWR raised the Middle River weir by 1 foot to increase the water level and to improve circulation in certain areas upstream of the barrier.

## Western Delta Municipal Water Users

DWR signed contracts with Contra Costa Water District in 1967 and the City of Antioch in 1968. These contracts compensate Contra Costa and Antioch for purchasing water of usable quality when such water is not available from Mallard Slough and the San Joaquin River.

According to the contract, DWR compensates each agency for the additional costs of purchasing a substitute water supply from the Contra Costa Canal. This water is purchased to replace water supplies of usable quality which are lost due to SWP operations. Credits for the number of days of above-average water supplies of usable quality, from Mallard Slough and the San Joaquin River, accrue to offset the number of below-average days in future years.





## **Chapter 3**

# **Environmental Programs**

*Delta tule pea, Lathyrus jepsonii.*

## Significant Events in 2012

In February 2012, the California Natural Resources Agency released the preliminary administrative draft of the Bay Delta Conservation Plan and a complete administrative draft of the environmental impact statement/environmental impact report for the plan to the lead agencies for review.

DWR finalized the Fish Restoration Program *Implementation Strategy* in March 2012.

The U.S. Fish and Wildlife Service issued a 12-month finding based on a rangewide status review of Longfin Smelt initiated in 2011. The finding, published in the Federal Register on April 2, 2012, concluded that listing the San Francisco Bay-Delta distinct population segment of Longfin Smelt as threatened under the federal Endangered Species Act (ESA) is warranted, but precluded by other higher-priority listings. The Bay-Delta distinct population segment has been added to the list of candidate species for ESA protection.

*Information in this chapter was contributed by the Division of Environmental Services, the Division of Operations and Maintenance, the Division of Integrated Regional Water Management, and the State Water Project Analysis Office.*



The Department of Water Resources (DWR) has developed and implemented several programs to avoid, minimize, and/or offset adverse environmental impacts resulting from construction and operation of State Water Project (SWP) facilities.

## Operations for Species of Concern

A primary consideration in the operation of the SWP is avoiding, minimizing, and/or offsetting adverse impacts to species of concern, species listed as threatened or endangered by a State or federal agency, or species proposed for listing. The SWP is operated pursuant to biological opinions (BOs) issued under the federal Endangered Species Act (ESA), as well as consistency determinations or incidental take permits issued under the California Endangered Species Act (CESA). A key to avoiding and minimizing adverse impacts to these species is maintaining flexibility in SWP operations. Operational responses can include Delta Cross Channel gate closure, export curtailments, changes in delivery schedules, increased reservoir releases, preferential use of certain facilities, or a combination of these actions.

Additional information can be found in Chapter 7, Water Supply Development and Reliability.

## San Joaquin River Restoration Program

The San Joaquin River Restoration Program (SJRRP) is a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of the Merced River and restore a self-sustaining Chinook salmon fishery in the river, while reducing or avoiding adverse water supply impacts from restoration flows.

In 2012, the SJRRP continued to make progress on numerous activities. The final

program environmental impact statement (EIS)/environmental impact report (EIR) was released in July 2012, and the record of decision and notice of determination were both signed and filed in October 2012. The selected preferred alternative includes the use of the river channel and bypass system to convey restoration flows and allows for recapture of these flows at existing facilities in the Sacramento-San Joaquin Delta and in the San Joaquin River upstream of the Delta at existing facilities or new facilities that may be constructed in the future. This alternative provides the greatest flexibility in implementing the settlement agreement.

The third year of interim flows was completed and the fourth year was initiated. Approximately 102,000 acre-feet of interim flows were recaptured and recirculated during the 2012 Central Valley Project (CVP) contract water year (March 1, 2012, through February 28, 2013).

Planning, environmental compliance, and design efforts for the Mendota Pool Bypass and Reach 2B Channel Improvements Project and the Reach 4B, Eastside Bypass, and Mariposa Bypass Channel and Structural Improvements Project continued to move forward.

The SJRRP received the ESA Section 10(a)(1) (A) permit (for the reintroduction of Central Valley spring-run Chinook Salmon) from the National Marine Fisheries Service (NOAA Fisheries). The NOAA Fisheries permit allows the SJRRP to start the broodstock efforts at the interim conservation facility at the San Joaquin Fish Hatchery.

Additionally, BOs for the SJRRP were received from NOAA Fisheries in August 2012 and the U.S. Fish and Wildlife Service (USFWS) in September 2012.

More information is available on SJRRP's website.

## Lower Yuba River Accord

The Lower Yuba River Accord's (Yuba Accord) purpose is to resolve instream flow issues and protect and enhance lower Yuba River fisheries and local water supply reliability. The Yuba Accord provides revenues for local flood control and water supply projects, water to enhance SWP and CVP water supply reliability by offsetting Delta export reductions for protection and restoration of Delta fisheries, and improvements in statewide water supply management, including dry year supplies for participating SWP and CVP contractors.

Water contracted by DWR under the Yuba Accord (Component 1 water) continues to be used to help offset Delta export reductions to benefit fish. In 2012, DWR executed an agreement to share equally with the Bureau of Reclamation (Reclamation) the 60,000 af of Component 1 water available to DWR each year from the Yuba Accord. The agreement covers 2012 through 2015.

For more information about the Yuba Accord, see Chapter 9, Water Contracts and Deliveries.

## Oroville Facilities

### Existing Federal Energy Regulatory Commission License Activities

#### Invasive Plant Management

During 2012, DWR partnered with the Butte County Agricultural Commissioner and the Department of Fish and Wildlife (DFW) to manage two invasive species. Butte County has been annually treating skeleton weed

(*Chondrilla juncea*) near McCabe Creek at Lake Oroville. DWR provided California Conservation Corps labor to clear access for Butte County to treat more of the known occurrence. DWR also provided California Conservation Corps labor for DFW to remove large stands of giant reed (*Arundo donax*) near the boat ramp at the Thermalito Afterbay Outlet.

DWR annually removes all red sesbania (*Sesbania punicea*) along the Thermalito Power Canal, Thermalito Forebay, and Thermalito Diversion Pool. This ongoing maintenance was started by the Department of Parks and Recreation in 2007. DWR took over in 2008 and will continue until red sesbania is eradicated. The Thermalito Power Canal, Forebay, and Diversion Pool are the upstream extent of the red sesbania population on the Feather River.

#### Feather River Fish Hatchery

A total of 10,011,168 juvenile fall-run Chinook Salmon (*Oncorhynchus tshawytscha*) were released into the Delta, the Sacramento River, and the San Francisco and San Pablo bays in 2012.

Also in 2012, a total of 2,244,899 spring-run Chinook Salmon were released: 1,134,280 in San Pablo Bay and 1,110,709 in the Feather River. Additionally, 420,488 steelhead were planted in the Feather River at Boyd's Pump Boat Launch.

#### Lake Oroville and Thermalito Afterbay

In January 2012, DWR purchased 500,000 sterile Coho Salmon (*Oncorhynchus kisutch*) eggs from Aquaseed Corporation in Washington. Excess eggs were purchased because egg survival in the hatchery was very low in 2011. The 2012 eggs survived at a better rate, and 79,600 fish were stocked as fingerlings in the lake in June to provide room in the hatchery. The remaining 211,600 eggs were stocked as yearlings in fall 2012. Total Coho Salmon planted in the lake in 2012 was 291,200.

Also during 2012, 10,000 steelhead were stocked in the Thermalito Afterbay due to a surplus egg supply at the Feather River Fish Hatchery (FRFH).

Habitat improvement continued in 2012 in the fluctuation zone of the lake. Approximately 2,000 Christmas trees were recycled with the help of Recology, the Boy Scouts, and the California Conservation Corps. The trees were constructed into structures for juvenile fish habitat in the Miners Ranch saddle dam area.

### **Oroville Wildlife Area**

Construction activities for two new wetland ponds in the Oroville Wildlife Area began in August 2010 and were completed in November 2011. A 20-acre area of low-quality, disturbed, upland habitat was converted into 10 acres of emergent wetland and 10 acres of riparian habitat. Revegetation efforts and nonnative plant species management began in spring 2012 and is ongoing. These wetland ponds were created as mitigation required by the 1995 federal Clean Water Act Section 404 permit for two waterfowl brood ponds that were constructed at the Thermalito Afterbay. The brood ponds were a requirement of the revised recreation plan that was part of the Federal Energy Regulatory Commission's September 22, 1994, order.

### **Lake Oroville Elevation**

The 2012 low point for the Lake Oroville reservoir elevation was reached on November 16 at 759.9 feet, and the annual high point of 899.0 feet was reached on May 16. The full pool elevation of Lake Oroville is approximately 900 feet.

### **Federal Energy Regulatory Commission Relicensing Activities**

Various conservation measures for the species identified in the USFWS 2007 BO for the Oroville Facilities relicensing project continued to be implemented on SWP

lands. Monitoring associated with these measures includes an annual vernal pool survey (645 mapped vernal pools and/or features); protective measures for elderberry shrubs (*Sambucus* species, host plant for the valley elderberry longhorn beetle [*Desmocerus californicus dimorphus*]); and annual monitoring of nesting Bald Eagles (*Haliaeetus leucocephalus*) in the area (five currently active nests). In addition, habitat management activities within the Oroville Wildlife Area are coordinated through DFW staff. These activities include providing nest and forage habitat for waterfowl and upland bird species, monitoring and maintaining Thermalito Afterbay brood pond water surface elevations, and protecting and conserving Giant Garter Snake (*Thamnophis gigas*) habitat. An annual compliance report for 2012 was compiled by DWR and submitted to USFWS.

For information about the Habitat Expansion Plan related to the Oroville Facilities relicensing and Arroyo Toad issues related to the South SWP Hydropower Project (Federal Energy Regulatory Commission Project No. 2426), see Chapter 10, Power Resources.

## **Invasive Species**

### **Quagga and Zebra Mussel Monitoring and Assessment**

The quagga mussel, *Dreissena rostriformis bugensis*, and the zebra mussel, *D. polymorpha*, are invasive freshwater mussels that pose a significant threat to the SWP. Both species attach to hard substrates, including other mussels, with strong byssal threads, forming dense colonies and causing significant biofouling impacts to raw water infrastructure by clogging small diameter piping and filters and encrusting trash racks and fish screens.

In early 2007, the quagga mussel was detected in the lower Colorado River and spread throughout connected water diversion systems (see Bulletin 132-08).



The following year, the zebra mussel was detected in San Justo Reservoir in San Benito County, adding to the existing threat. In response, DWR formed the Aquatic Nuisance Species (ANS) Program within the Division of Operations and Maintenance. The program includes applied studies, early detection monitoring, vector management, rapid response planning, long-term mussel management, and public outreach.

### **Applied Studies**

**Assessment of Habitat Suitability.** DWR's consultant, RNT Consulting Inc. (see Bulletin 132-11), examined the suitability of the SWP to support long-term populations of quagga and zebra mussels (dreissenids) if unintentionally introduced. Based on the results, locations in the SWP were classified into one of three groups: unable to support, potentially able to support, or able to support long-term populations of dreissenid mussels (see Bulletin 132-12). Understanding where dreissenid mussels may survive in the SWP will be used to prioritize management efforts.

To verify the determination, RNT Consulting Inc. tested mussel survival in SWP waters with different levels of calcium (see Bulletin 132-12). The results of this study were presented in the 2012 report, *Evaluation of Mussel Survival in Water with Different Calcium Levels*. The study did not establish if mussels would survive long-term in low to moderate suitability SWP waters due to a change in pH in the water storage tanks that may have significantly altered mussel survival and spawning success during the experiment.

### **Development of Control Methods.**

RNT Consulting Inc. conducted bench-top chemical mussel control trials in mobile flow-through laboratories at San Justo Reservoir and at Davis Dam on the Colorado River. The chemicals tested included several copper-based algaecides, peroxide, sodium carbonate peroxyhydrate, and two endothall

herbicide formulations. All products were tested on both quagga and zebra mussels. Short-term exposure and recovery tests were carried out to determine the presence or absence of post-exposure mortality. Dose-response curves were developed for each product for a minimum of 96 hours of exposure. None of the chemicals tested produced 100 percent mortality. The results are under analysis and are anticipated to be available in 2013.

**Early Detection Monitoring.** DWR routinely monitors the California Aqueduct, SWP reservoirs, and the Sacramento-San Joaquin Delta for the presence of quagga and zebra mussels. DWR uses three different methods to monitor for mussels: zooplankton tows (with DNA analysis) for veligers; settlement plates (see Bulletin 132-10); and bioboxes for adults (attached/settled stage).

In 2012, DWR and two collaborating water agencies, Santa Clara Valley Water District and The Metropolitan Water District of Southern California, collected veliger samples at 16 locations (see Bulletin 132-10). In addition, DWR staff are trained in quagga and zebra mussel identification, and are instructed to look for mussels during regular field work and during routine facility maintenance activities. No mussels were detected in the SWP, the Delta, or other SWP source water during 2012.

### **Prevention and Response Planning**

To protect and prepare the SWP against mussels, ANS Program staff developed several planning documents to guide actions and identify vulnerabilities. The *Quagga and Zebra Mussel Vector Management Plan for the State Water Project* identifies potential mussel points-of-entry and vectors, and outlines mechanisms to reduce the risk of introduction. The two primary vectors of mussels are downstream transport of planktonic veligers in natural and constructed waterways and overland transport of veligers and attached adults

on watercraft. A critical component of the vector management plan is reducing the risk posed by watercraft. To accomplish this, DWR contracted with the Department of Parks and Recreation and the Los Angeles County Department of Parks and Recreation to implement vessel inspection and outreach programs at San Luis State Recreation Area (San Luis Reservoir, O'Neill Forebay, and Los Banos Creek Reservoir) and Pyramid and Castaic lakes (see Bulletin 132-12). At San Luis State Recreation Area, a total of 5,569 vessels were inspected during 2012. Of those vessels, 430 failed the inspection due to the presence of wet equipment or standing water and were not allowed to launch. At Castaic Lake, a total of 13,959 vessels were inspected, and 948 of those vessels failed the inspection. At Pyramid Lake, 15,878 vessels were inspected, with 735 failures. No mussels were found during the inspections.

In the event mussels are detected in the SWP, the *Quagga and Zebra Mussel Rapid Response Plan for the State Water Project* outlines a course of action to confirm the sighting, delineate the population, implement containment and eradication measures, and notify State and federal partner agencies, the SWP water contractors, and any potentially impacted entities.

With uncontrolled watercraft access to and from infested bodies of water, such as the Colorado River, the SWP and the Delta remain vulnerable to mussel infestation. Therefore, DWR is preparing a long-term mussel management plan that identifies facility vulnerabilities and outlines both short-term and long-term options to prevent or mitigate mussel biofouling impacts for all at-risk SWP facilities. The short-term control strategies are those that can be implemented within a few weeks to a few months time and may be temporary in nature, such as shutdowns for power washing and shell removal. The long-term control strategies have longer implementation times (6 months to multiple years) and are permanent in nature (alterations to infrastructure).

RNT Consulting Inc. is assisting DWR with plan preparation. The first phase of the project focused on Southern Field Division facilities, as RNT Consulting Inc. determined that all facilities located downstream of Check 41 are at the highest risk of mussel establishment. RNT Consulting Inc. and DWR ANS Program staff conducted facility site visits, focusing on raw water infrastructure, and determined the areas vulnerable to mussel biofouling. The report for Southern Field Division facilities was completed in September 2012. Site visits for facility vulnerability assessments for the remainder of the SWP were completed in June 2012. Similar reports will be prepared for the Delta, San Luis, and San Joaquin field divisions. As a follow up to the management plan reports, RNT Consulting Inc. will develop cost estimates for facility retrofit implementation.

## The Bay Delta Conservation Plan

In 2012, State and federal agencies continued collaboration and analysis toward drafting the Bay Delta Conservation Plan (BDCP) and the corresponding EIR/EIS documents. In February 2012, the preliminary administrative draft of the BDCP was released to agencies. Other BDCP highlights in 2012 included refinements to Conservation Measure 1, review and revision of biological goals and the conservation strategy for covered species, and continued scientific review of the effects analysis.

### Conservation Measure 1 Refined

BDCP Conservation Measure 1, water facilities and operations, was revised in 2012. After extensive analysis and consultation with the fish and wildlife agencies and stakeholders, on July 25, 2012, the Governor of California, Secretary of the Interior, and Administrator of the National Marine Fisheries Service announced a revised proposed project for the BDCP that would construct and use three intakes

instead of five at a maximum pumping capacity of 9,000 cubic feet per second (cfs) (instead of the 15,000 cfs proposed earlier). This configuration and capacity was chosen because the water facilities would meet projected water supply needs and would not require phased construction. The use of three intakes was found to be sufficient to meet diversion volume needs during the BDCP term, and would have fewer environmental impacts compared to construction of five intakes.

### Biological Goals and Conservation Strategy Reviewed and Refined

Subsequent to the release of the 2012 administrative draft BDCP, fish biologists representing several consulting firms and agencies met and conducted collaborative reviews and revisions of the biological goals and objectives for all covered fishes. The process was accompanied by a number of revisions to conservation measures, particularly Conservation Measure 1 and the operating criteria for water facilities, in order to assure that the conservation measures would be sufficiently protective to achieve the biological goals and objectives. Similar processes were also conducted for several covered terrestrial species, including the Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*), Greater Sandhill Crane (*Grus canadensis tabida*), and Giant Gartersnake (*Thamnophis gigas*).

### Effects Analysis Review Continued

Because the BDCP will alter the physical and biological environment of the Delta, it includes an effects analysis to describe predicted effects on biological performance, particularly with regard to covered species' population levels. The effects analysis will be the foundation for the biological assessment and subsequent BO issued by the federal agencies. It is a systematic, scientific look at both potential impacts and potential benefits from conservation actions.

In 2012, an independent science review panel, convened by the Delta Stewardship Council in 2011, continued to assess the scientific quality of the effects analysis and produced a report with its findings.

### BDCP EIR/EIS

A combined EIR/EIS is currently underway and will fulfill requirements under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA). DWR is the State lead agency and Reclamation, USFWS, and NOAA Fisheries are the federal co-lead agencies. A complete administrative draft was released to the lead agencies for review in 2012. The administrative draft was available to the public for pre-review. This joint document reviews the environmental effects of the proposed BDCP and a reasonable range of alternatives, including a "no action" alternative. This evaluation will help determine the ultimate preferred alternative and final plan. The lead agencies will continue evaluation of options that include a pipeline/tunnel as well as options to restore up to 65,000 acres of tidal habitat. The EIR/EIS will evaluate the potential impacts of the BDCP including impacts to local communities, cultural resources, and the physical and biological environment.

### Environmental Surveys

DWR began conducting wetland field surveys using the California Rapid Assessment Method to evaluate the condition of wetlands as part of an ongoing effort to collect environmental data for the Delta Habitat Conservation and Conveyance Program.

### Geotechnical Monitoring

DWR's geotechnical monitoring continued in 2012. Specifically, DWR conducted geotechnical borings on properties owned by DWR and those with expressed permission to enter in the summer and fall of 2012 to obtain information associated with the BDCP

and preliminary engineering studies for the new proposed conveyance facilities.

## Biological Opinions Issued on CVP/SWP Operations

NOAA Fisheries and USFWS have both issued BOs on CVP and SWP operations that include reasonable and prudent alternatives (RPAs) to avoid jeopardy of federally listed species. Both BOs have been remanded by federal court.

In December 2012, a joint motion for a 3-year extension of the remand schedule

was filed with the court along with a proposal for an alternative remand process agreed upon by DWR, DFW, Reclamation, USFWS, and NOAA Fisheries. The proposed alternative remand process would allow the agencies to undertake a collaborative adaptive management approach to interim operations under the existing BOs, enable a more efficient and focused evaluation of RPAs, allow joint completion of new BOs and the associated NEPA process, and test the type of science program proposed under the BDCP. Details for items that preceded this action, pertaining to the individual BOs, are below.

### Endangered Species and Biological Opinions

An endangered species is one in danger of extinction in all or a significant portion of its range; a threatened species is one likely to become endangered. The Endangered Species Act (ESA) and the California Endangered Species Act (CESA) are designed to protect threatened and endangered species by ensuring federal and State agencies adopt measures to protect the species during the design, construction, and operation of projects, or for other forms of agency action, and prohibit the unauthorized take of endangered species. Biological opinions and incidental take permits are issued to protect ESA- and CESA-listed species.

ESA Section 7 requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species or modify their critical habitat, otherwise formal consultation is required. Federal agencies must consult with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service (the wildlife agencies). As part of the consultation process, the wildlife agency issues a biological opinion which states the agency's determination of whether the action is likely to jeopardize a species or adversely modify critical habitat. If the wildlife agency determines an action will jeopardize or adversely modify, it will suggest reasonable and prudent alternatives that the "action agency" may take to avoid the likely jeopardy or adverse modification (Title 16, United States Code Sections 1531–1544 [1973]).

CESA is substantially similar to ESA in all aspects (California Fish and Game Code Sections 2050–2098 [1984]). Under CESA, an incidental take permit issued by the Department of Fish and Wildlife can allow for the take of State-listed species if specific criteria are met, including measures to minimize and mitigate the impacts of authorized take (California Code of Regulations, Title 14, Sections 783.0–783.8).



## USFWS Biological Opinion

The jeopardy conclusion of the 2008 USFWS BO was upheld based on federal court findings that fish entrainment at the pumping facilities will adversely affect Delta Smelt (*Hypomesus transpacificus*). However, because the science supporting flow prescriptions in the BO was questioned, and the economic and technical feasibility of the RPAs was not considered, the BO was remanded. The court set a deadline for development of a new Delta Smelt BO, RPAs, and NEPA review by Reclamation to be completed by December 1, 2013.

## NOAA Fisheries Biological Opinion

The 2009 NOAA Fisheries BO was amended in 2011 with updates to the RPAs including improvements to real-time operations and data collection, as well as clarification of specific actions.

In September 2011, a federal court upheld the jeopardy conclusion of the 2009 NOAA Fisheries BO, but found that RPAs were not adequately justified or supported by the record. The court directed a remand of the BO. In December 2011, the court ordered that a new draft BO be transmitted by October 1, 2014, and a final BO by February 1, 2016.

In January 2012, a joint stipulation was filed by NOAA Fisheries, DWR, and some of the plaintiffs in the consolidated salmonid cases litigation regarding the 2009 BO. The stipulation set up a plan for coordinated operation of the State and federal projects for April 1 through May 31, 2012, seeking to strike a balance between Delta exports and species protection and replacing certain requirements of the 2009 BO. Notable items of the agreement were eliminating the San Joaquin inflow-to-export ratio and reviving the spring Head of Old River barrier under certain conditions; installing a rock barrier at the confluence of Old River and the San Joaquin River with the goal of reducing entrainment of salmonids

into Old River; preferential diversion at the CVP facilities; setting allowable ranges for negative (reverse) flows in Old and Middle rivers induced by project operations; and outlining a procedure describing how the desired flows could be adjusted adaptively. As part of the adaptive management process, the stipulation called for operation and maintenance of an acoustic receiver array in the Lower San Joaquin River and Delta and an acoustically tagged juvenile salmonid study to gather information on migratory patterns, responses to Old and Middle rivers changes, and route entrainment.

The 2012 stipulation study was conducted in the spring. The initial stipulation study and the resulting Old and Middle rivers actions were presented at the 2012 Long-term Operations Opinions Annual Review meeting from October 31 through November 1, 2012. The Delta Science Program Independent Review Panel's annual review report can be found on the Delta Stewardship Council's website.

## Delta Operations for Delta Smelt and Longfin Smelt

The Smelt Working Group (a team of interagency experts on Delta Smelt and Longfin Smelt biology) may meet at any time at the request of the USFWS, but generally meets regularly from December through June to assess the risk to Delta Smelt and Longfin Smelt (*Spirinchus thaleichthys*) from CVP and SWP export facilities. Based on near real-time technical information, such as fish distribution and salvage and physical water conditions, the Smelt Working Group makes recommendations on export operations to the USFWS and DFW with the goal of reducing entrainment of the two species.

Recommendations are based on guidelines outlined in the 2008 USFWS BO and the 2009 DFW Longfin Smelt incidental take permit (see Bulletins 132-11 and 132-12).

Though flows were relatively low during the 2011–2012 water year, the Smelt Working Group did not make any recommendations to modify water project operations.

Risk of entrainment remained low during the year, and criteria that would trigger the implementation of actions were not met by physical water conditions, real-time distribution of fish throughout the Delta system, and/or quantities of fish salvaged at the export facilities.

Salvage of Delta Smelt and Longfin Smelt increased over the previous 2 years at both facilities. Delta Smelt salvage in 2012 was 1,999 at the SWP and 355 at the CVP. These values were the highest observed since 2007 and 2008, respectively. Longfin Smelt salvage was 2,842 at the SWP and 898 at the CVP. These were the highest observed values since 2002 and 2003, respectively.

## Fish Restoration Program

Pursuant to the USFWS and NOAA Fisheries BOs and the DFW Longfin Smelt incidental take permit (see Bulletin 132-11), the Fish Restoration Program (FRP) has continued to make progress towards fulfilling its restoration requirements. The *FRP Implementation Strategy*, finalized in March 2012, explains how the goals of the Fish Restoration Program Agreement will be accomplished and lays out a course to meet the requirements in the BOs and incidental take permit. The *Implementation Strategy* is available on DWR's website.

The FRP continued to work with its consulting team on Prospect Island baseline data collection, restoration modeling, and design. In October 2012, conceptual restoration design and preliminary modeling results were reviewed by a Delta Regional Ecosystem Restoration Implementation Plan panel during a 2-day workshop. A final set of restoration alternatives was chosen for the

second phase of more in-depth modeling. Those results are expected in 2013.

DWR's North Central Region Office continued a site characterization and groundwater monitoring study which began in January 2010. The purpose of this study is to better characterize the subsurface hydrogeological conditions in the Prospect Island and Ryer Island study area (along Miner Slough on the eastern boundary of Prospect Island and the corresponding portion of Ryer Island to the east of Miner Slough) to further evaluate the potential for seepage to occur on Ryer Island as a result of flooding on Prospect Island. A summary of the data collected was prepared and published in June 2012. The final project report is anticipated to be complete in the early part of 2014.

In other areas of the FRP, outreach efforts began with confidential stakeholder interviews with a variety of Delta and Suisun Marsh stakeholders. Stakeholders with extensive knowledge of and involvement with Delta issues were interviewed to learn more about their interests, issues, and concerns about the FRP. The interests, issues, and concerns the stakeholders expressed were documented in the *Stakeholder Assessment Summary*. The programmatic *Communications & Engagement Plan*, developed as a result of the stakeholder assessment, will help guide the FRP's stakeholder engagement efforts. These documents can be found on DWR's website. The FRP also started a listserv (managed email list), which interested stakeholders can join to receive updates about the FRP.

The FRP continues to work on interim land management issues on Prospect Island. DWR's legal access to the island is being researched and verified by the DWR Real Estate Branch. The Division of Flood Management Sacramento Maintenance Yard started clearing the vegetation from the Miner Slough levee slopes and expects

this work to be done in early 2013. A levee inspection will follow shortly thereafter.

DWR provided a total of \$12 million to the Battle Creek Salmon and Steelhead Restoration Project (Battle Creek Project) at the direction of DFW pursuant to the *Fish Restoration Program Agreement* in 2011 and 2012. The first \$5.3 million was provided to DFW in June 2011 to be used for Phase 1A in order for Phases 1B and 2 to move forward in a timely manner. The second \$6.7 million was provided directly to Reclamation in June 2012 to be used to fund the activities set forth in Phase 2 of the project. DWR requested that NOAA Fisheries concur that the transfer of the \$12 million to DFW and Reclamation has fully satisfied all of its legal obligations under Action I.2.6 of the BO. DWR is waiting for a response from NOAA Fisheries.

## Decisions on Endangered Species

Table 3-1 lists fish species of concern found in the Delta. No status changes were made in 2012.

### Longfin Smelt

The USFWS issued a 12-month finding based on a rangewide status review of Longfin Smelt initiated in 2011. The

finding, published in the Federal Register on April 2, 2012, concluded that listing the San Francisco Bay-Delta distinct population segment of Longfin Smelt as threatened under the ESA is warranted but precluded by other higher priority listing actions. Therefore, the Bay-Delta distinct population segment has been added to a list of candidate species for ESA protection. No new requirements or restrictions are imposed by the finding. Longfin Smelt remain listed as threatened under CESA.

## Trends in Fish Abundance

Abundance indices for Longfin Smelt and Delta Smelt are based on DFW fall midwater trawl sampling conducted every year from September through December. Index calculations are based on average catch per trawl for 100 core index stations, which are partitioned into 14 geographic areas. The average monthly catch per tow in each area is multiplied by a weighting factor that is based on the estimated volume of water in each area. The resulting values are then summed over all areas and months to obtain the annual index. This fall abundance index provides one of the best indicators of the status of the adult Longfin and Delta Smelt populations over a relatively long period of time.

**Table 3-1 Special Status Delta Fish Species**

Common Name	Scientific Name	Date of Listing or Action	
		ESA	CESA
Delta Smelt	<i>Hypomesus transpacificus</i>	threatened (4/5/1993)	endangered (1/20/2010)
Longfin Smelt	<i>Spirinchus thaleichthys</i>	candidate <sup>a</sup> (4/2/2012)	threatened (4/9/2010)
Chinook Salmon (winter-run)	<i>Oncorhynchus tshawytscha</i>	endangered (2/3/1994)	endangered (9/22/1989)
Chinook Salmon (spring-run)	<i>Oncorhynchus tshawytscha</i>	threatened (11/15/1999)	threatened (2/5/1999)
Chinook Salmon (fall/late fall-run)	<i>Oncorhynchus tshawytscha</i>	species of concern (4/15/2004)	none
steelhead (Central Valley DPS)	<i>Oncorhynchus mykiss</i>	threatened (5/18/1998)	none
Green Sturgeon (Southern DPS)	<i>Acipenser medirostris</i>	threatened (6/6/2006)	none

ESA = federal Endangered Species Act; CESA = California Endangered Species Act; DPS = distinct population segment

<sup>a</sup> On April 2, 2012, the USFWS found that listing the San Francisco Bay-Delta DPS as threatened or endangered is warranted but precluded by other higher priority listing actions and has added the San Francisco Bay-Delta DPS of Longfin Smelt to its list of candidate species.

The abundance index for Longfin Smelt is shown on Figure 3-1. Values for 2012 dropped to the second lowest value on record since 1967.

Figure 3-2 shows the abundance index for Delta Smelt from 1967 through 2012. After a brief rise in the index in 2011, values for 2012 decreased to a value similar to the record low levels observed during the 2002–2010 period.

For more about the declining abundance of Delta Smelt and other pelagic fish species in the Delta, see the Pelagic Organism Decline section in this chapter.

Figure 3-3 shows estimates of returning adult winter-run Chinook Salmon from 1970 through 2012. These estimates, referred to as escapement estimates, are the number of adults that escape mortality and return to spawn. The Sacramento River winter-run Chinook Salmon escapement estimates are generated using data from the DFW carcass survey. DFW has been using the carcass survey data to generate escapement estimates since 2001, prior to which Red Bluff Diversion Dam counts were used. The estimated winter-run Chinook Salmon escapement for 2012 was 2,767, which was more than three times higher than in 2011, but still amongst the lowest values since 2001.

Figure 3-4 shows estimates of returning adult spring-run Chinook Salmon from 1985 through 2012. Individual estimates are shown for FRFH and the principal spring-run spawning streams: Mill Creek, Deer Creek, and Butte Creek. The escapement estimates are shown separately for each stream, because the Feather River estimate is based on returns to the FRFH, where the genetic integrity of spring-run Chinook Salmon is uncertain. The estimated escapement for 2012 was 3,738 for FRFH and 10,120 for the other streams combined. The 2012 escapement for both the FRFH and for

naturally spawned fish in Mill, Deer, and Butte creeks was just over four times the 2009 parent stock escapement estimates, and the highest estimates observed since 2006.

Due to the lack of comprehensive monitoring programs, there are no reliable escapement estimates for wild Central Valley steelhead.

## Pelagic Organism Decline in the Upper San Francisco Estuary

By the early 2000s, long-term monitoring by the Interagency Ecological Program revealed marked declines in numerous pelagic (open water) fish species in the upper San Francisco Estuary (the Delta and Suisun Bay). This decline has collectively become known as pelagic organism decline (POD).

Pelagic fish species in decline include Delta Smelt, Longfin Smelt, Striped Bass (*Morone saxatilis*), and Threadfin Shad (*Dorosoma petenense*). These declines resulted in significant management consequences, including limits on SWP and CVP pumping operations for the protection of Delta Smelt (listed as threatened under ESA and endangered under CESA) and Longfin Smelt (listed as threatened under CESA).

Since 2005, Interagency Ecological Program scientists have been coordinating studies investigating potential causes of POD. In 2010, an “ecosystem regime shift” conceptual model was put forward, hypothesizing that POD was caused by changes to multiple and interacting environmental variables, such as outflow, turbidity, and salinity, which led to fundamental changes to the Delta ecosystem (see the Interagency Ecological Program *Pelagic Organism Decline Work Plan and Synthesis of Results*, available on DWR’s website). This conceptual model has served as a working hypothesis for continuing POD investigations since 2011. In late 2011, the



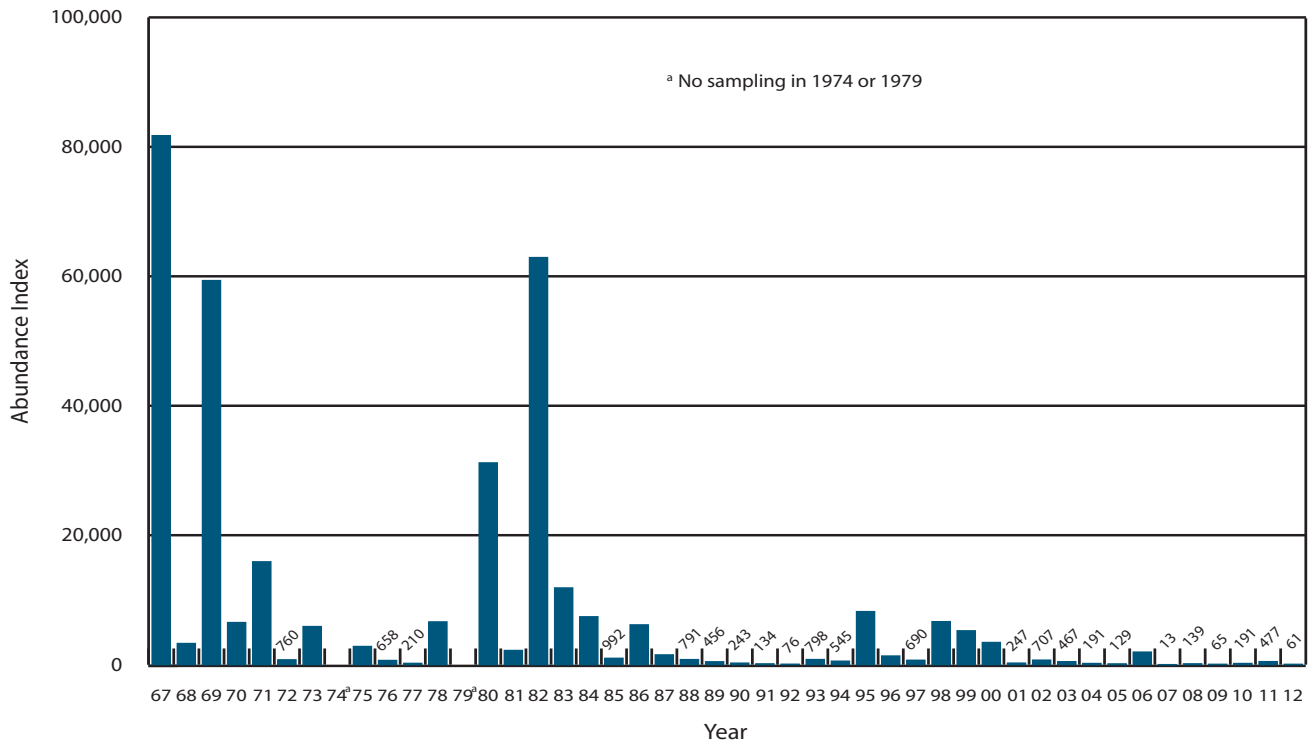


Figure 3-1 Longfin Smelt Fall Midwater Trawl Abundance Index, 1967–2012

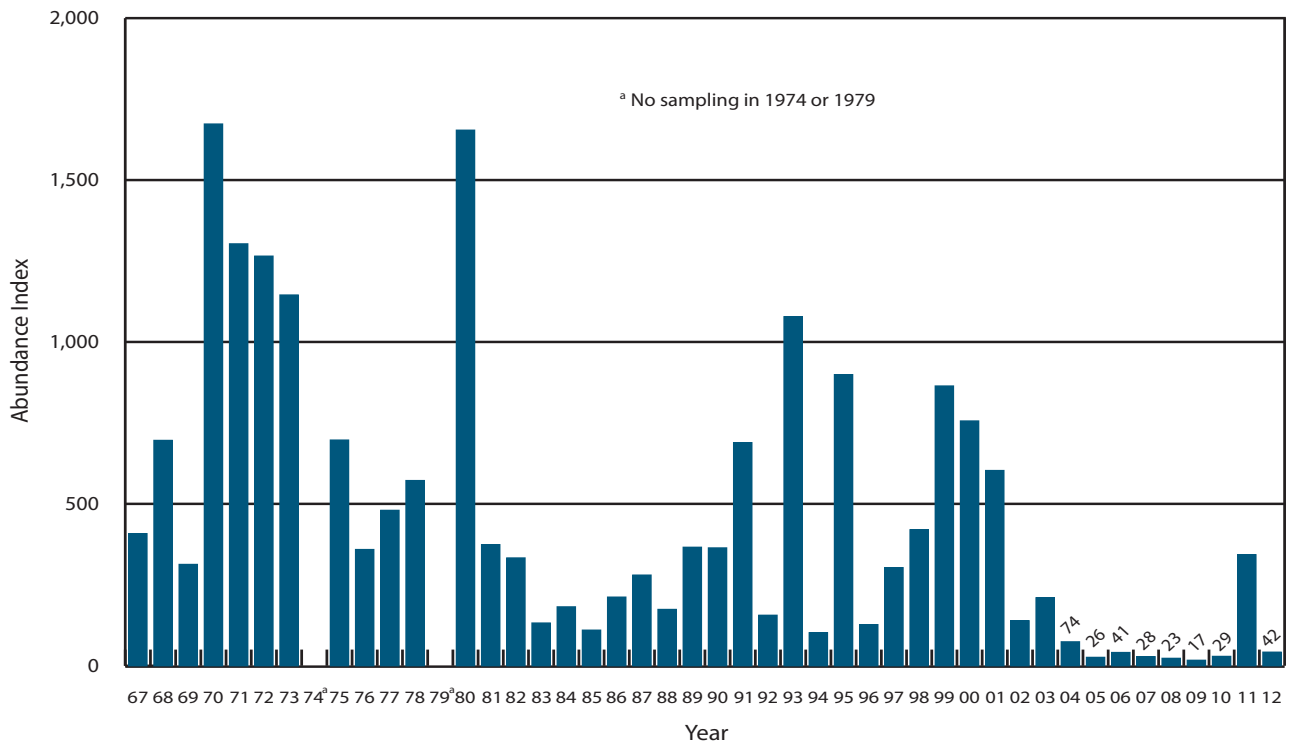
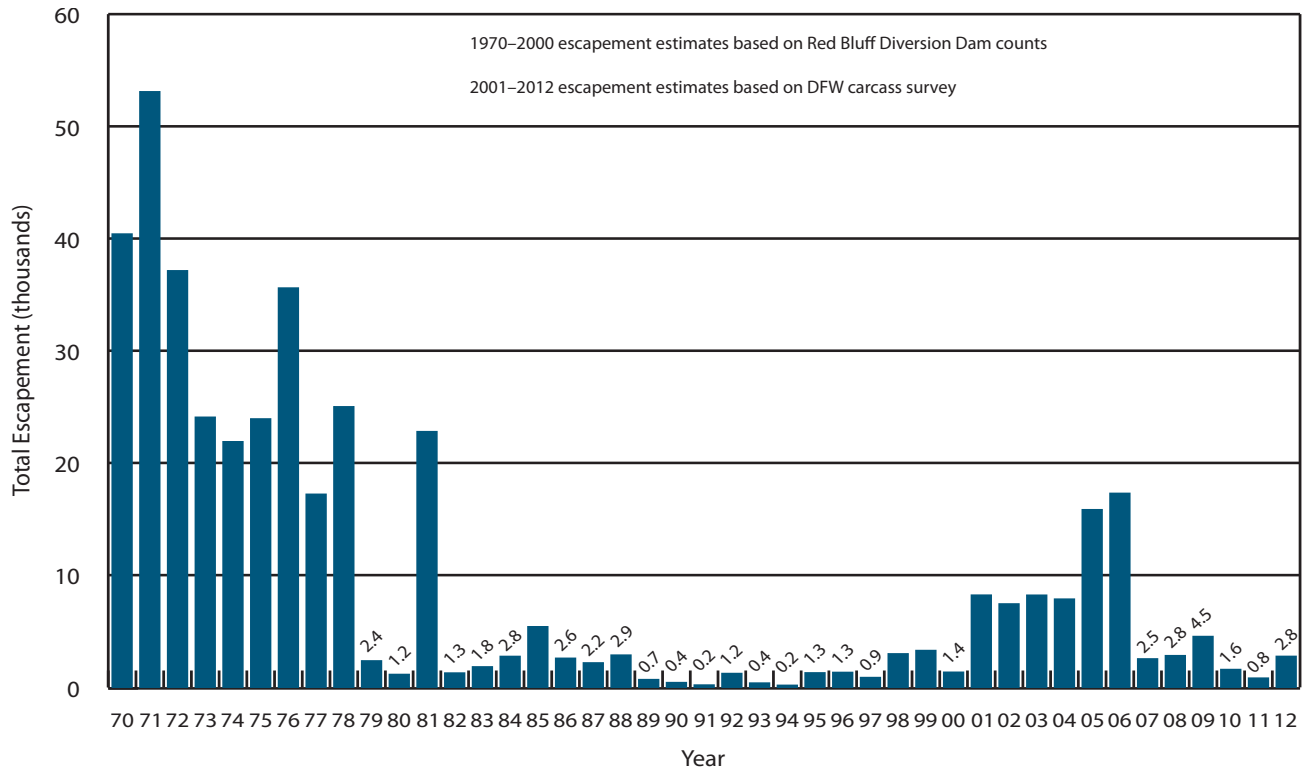
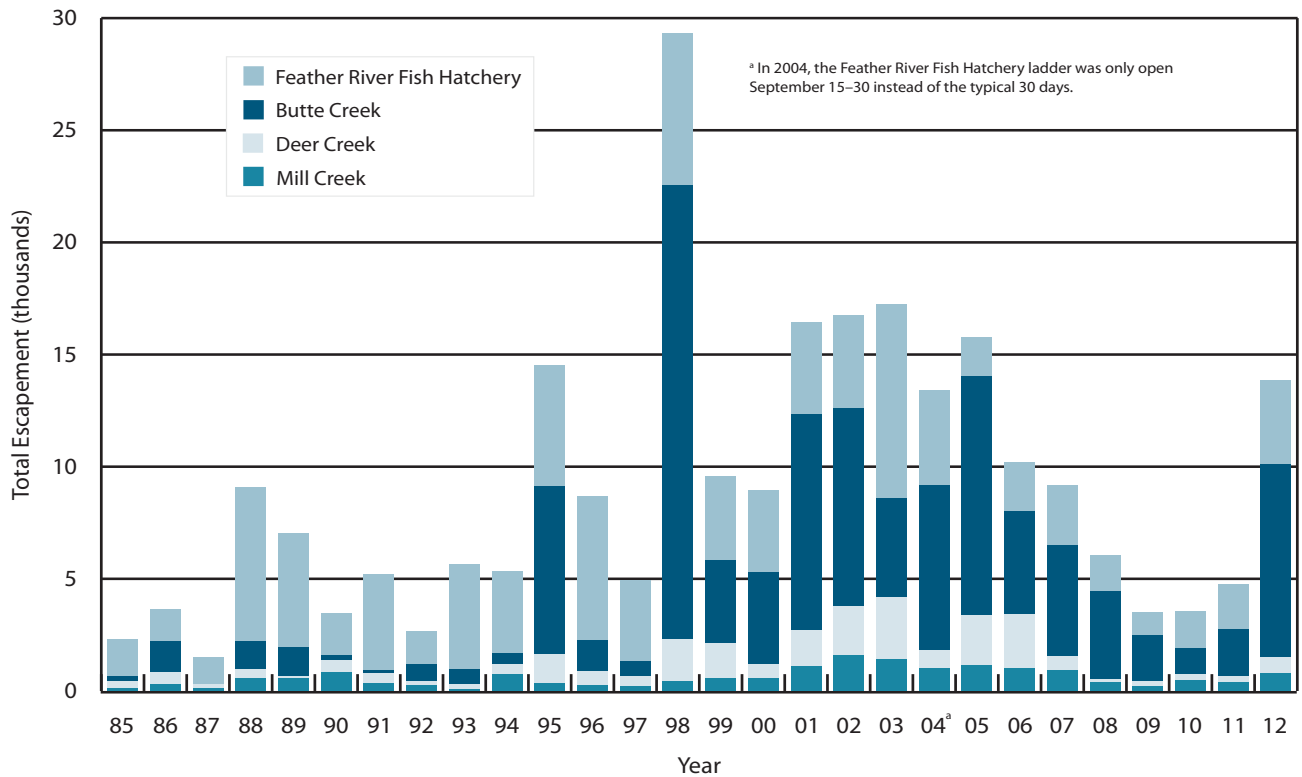


Figure 3-2 Delta Smelt Fall Midwater Trawl Abundance Index, 1967–2012



**Figure 3-3 Estimated Total Adult Winter-run Chinook Salmon Escapement, 1970–2012**



**Figure 3-4 Estimated Total Adult Spring-run Chinook Salmon Escapement, 1985–2012**



Interagency Ecological Program formed the Management, Analysis, and Synthesis Team to synthesize scientific datasets with the goal of addressing pressing management information needs.

An emphasis of the team in 2012 was to evaluate possible drivers for the Delta Smelt population increase in 2011. In addition, the Management, Analysis, and Synthesis Team and the Interagency Ecological Program identified priority information gaps to guide future research projects, which included studies that elucidate fish population dynamics, fish distribution and health, and population effects of the food webs and water diversions.

## Feather River Fish Studies

In the early 1990s, the Feather River fish studies were initiated to document and monitor fish populations in the lower Feather River. Early efforts focused on studies to identify flow requirements for Chinook Salmon and steelhead. The program has progressively expanded since the mid-1990s in preparation for the Federal Energy Regulatory Commission relicensing of the Oroville Facilities. Field program elements have expanded to include operation of rotary screw traps (RSTs), acoustic and radio telemetry, salmon and steelhead spawning surveys, salmon escapement surveys, spring-run Chinook Salmon tagging, otolith thermal marking studies, snorkel surveys, Green Sturgeon studies, and steelhead acoustic tagging.

The study area is generally divided into the low-flow channel, from the Fish Barrier Dam downstream to the Thermalito Afterbay Outlet, and the high-flow channel, from the Thermalito Afterbay Outlet downstream to the confluence with the Sacramento River at Verona (Figure 3-5).

## Rotary Screw Traps

RSTs capture juvenile salmon and steelhead as they emigrate from the Feather River. Over the last 15 years, DWR has used RSTs as the primary method to assess the general abundance and timing of emigrating juvenile salmon and steelhead in the lower Feather River. In addition, large numbers of naturally produced (wild) salmon have been coded wire tagged in an effort to examine their return success. This long-term monitoring yields valuable baseline information about juvenile salmonid production in the lower Feather River and the effects of project operations on abundance and migration timing.

Emigration timing and speed measurements confirm that most wild juvenile Chinook Salmon move rapidly through the upper reaches of the lower Feather River. Consistent with select years of trapping data, turbidity may influence the emigration timing of wild juvenile salmon. However, other studies demonstrate that the timing of adult spawning plays a large role in determining juvenile salmon emigration patterns as well.

The 2012 season was fished throughout the emigration period (December through May). Two RST locations were used to assess the timing and general abundance of juvenile Chinook Salmon, steelhead, and other fishes emigrating in the lower Feather River. Within the low-flow channel, one RST (Steep Riffle) was stationed at River Mile (RM) 61, approximately 2 miles above Thermalito Afterbay Outlet. The Steep Riffle RST was operated from December 4, 2011, to June 12, 2012. Within the high-flow channel, two RSTs were fished in tandem at Herrerger Riffle at RM 46 from December 26, 2011, through May 17, 2012. The Steep Riffle location provided a passage estimate of 9,972,369 juveniles, and the Herrerger Riffle location estimate was 9,606,732 juveniles.

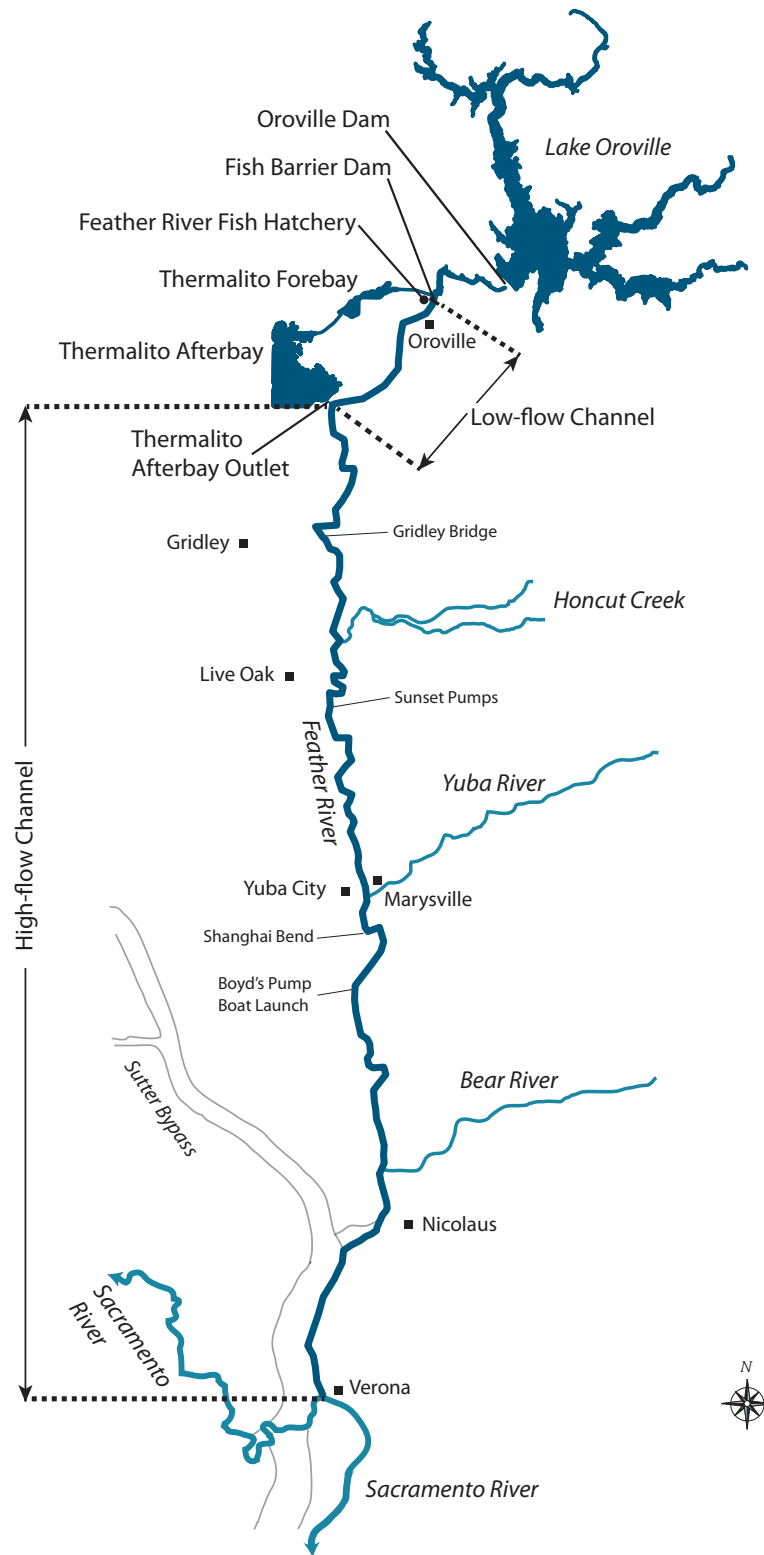


Figure 3-5 The Lower Feather River

Although Chinook Salmon and steelhead were the primary targets of trapping efforts, records were kept on all fish species caught. Twenty-two species were caught during the 2012 season. Chinook Salmon was the dominant species, comprising 99 percent of the catch. A total of 1,103,610 Chinook Salmon were caught in the RSTs with 901,315 (82 percent) of those captured in the low-flow channel and 202,295 (18 percent) caught in the high-flow channel.

A total of 9,117 Chinook Salmon at Herreriger Riffle and 6,534 at Steep Riffle were measured for fork length in 2012. Salmon emigration was observed from December to May, with the highest levels occurring in January and February.

### Acoustic and Radio Telemetry

Acoustic and radio telemetry gathers baseline information on the migration and holding patterns of adult Chinook Salmon in the lower Feather River. A telemetry study was conducted to collect additional data to evaluate the relationship between water temperature and migration patterns of prespawning adult Chinook Salmon.

Chinook Salmon with a spring-run life history enter freshwater in early summer and hold in the river up to several months before spawning. In order to collect additional data to evaluate water temperature and migration patterns of prespawning adult Chinook Salmon, spring-run adult Chinook Salmon are captured and tagged with radio tags or acoustic tags to document their habitat use. Because the water temperature regime associated with the ongoing operation of the Oroville Facilities may expose prespawning adult Chinook Salmon to elevated water temperatures during the migration and holding period, radio and acoustic tagging was implemented to determine whether the pools downstream of the Thermalito Afterbay Outlet provide water temperatures suitable for holding.

Between May 22 and June 28, 2012, 29 adult Chinook Salmon designated as having spring-run life history traits were captured using hook-and-line sampling (angling) and implanted with acoustic tags at Sunset Pumps and the Shanghai Bend area. These fish were monitored along the 67-mile stretch of river from the Fish Barrier Dam near the FRFH to the confluence with the Sacramento River at Verona. Twenty-nine submersible hydrophone receivers positioned at various locations along this stretch picked up the signals from the implanted tags as the fish passed the receivers. Mobile tracking was performed approximately once a week from June through November using an ultrasonic receiver mounted in a boat. Fixed station receivers were checked at least once per month during the survey season. All 29 (100 percent) of the tagged fish were subsequently detected.

Two (6.9 percent) of the fish showed no upstream movement and were last detected at the furthest downstream receiver located near the confluence with the Sacramento River. Most (89.7 percent) of the tagged fish moved upstream and stayed in the Feather River, with 72.4 percent making it to the Fish Barrier Dam. A total of 10.3 percent of the tagged fish left the system.

On average, it took 6.4 days for the tagged fish to swim to the Thermalito Afterbay Outlet (RM 59), with an average rate of travel of 3.75 miles per day. The average time spent at the Thermalito Afterbay Outlet was 4.2 days, whereas the average time spent at the Fish Barrier Dam was 36.7 days. The pools below Matthews Riffle and Riverbend Park were the areas where the tagged fish spent most of their time in the low-flow channel. This is consistent with holding behavior seen in previous years.

From May through August, temperatures rarely rose above 16°C (61°F) just downstream of the FRFH, while temperatures remained consistently around 20°C (68°F)

in the high-flow channel near the project boundary. All of the fish last detected in the low-flow channel (82.8 percent of the total tagged) were detected at or above Matthews Riffle (RM 64.1), which suggests that water temperature may be a driving factor for salmon to move upstream to hold in the cooler pools of the low-flow channel.

## Spawning Surveys

To better understand Feather River salmon and steelhead spawning characteristics, redd surveys (a redd is a shallow depression in a streambed, excavated by a salmonid and containing deposited fish eggs) are performed to identify the location, timing, magnitude, and physical characteristics of natural spawning sites in the lower Feather River. The surveys are generally performed weekly, and most of the available spawning area between the Fish Barrier Dam and Gridley Bridge is searched.

## Salmon

Ground surveys for the 2012 Chinook Salmon redd survey began on August 8 when redds were discovered in lower Moe's Side Channel. Ground surveys began again on September 12 and continued until November 7. The redd survey consisted of a total of eight survey weeks.

The Chinook Salmon redd survey protocol for 2012 was modified from the 2011 protocol to provide more comparable physical data (depth, velocity, and substrate characteristics) for redds in the upper sections of the low-flow channel where gravel augmentation work was completed in 2014.

During the eight weekly surveys, 1,947 mature redds were found within the spawning area between Table Mountain Riffle (RM 66.9) and the Thermalito Afterbay Outlet (RM 59) in the low-flow channel. Another 212 redds were discovered in the

high-flow channel from the Thermalito Afterbay Outlet to the Gridley Bridge.

The week 4 survey (October 3 to October 5) covering the majority of the low-flow channel identified the highest number of redds with 581. The second highest total was 428 redds for the survey conducted September 27 and 28 covering the area from Table Mountain Riffle (RM 66.9) to Matthews Riffle (RM 64). The locations with the largest number of redds were the Lower Auditorium Riffle area with 490 (25 percent) and Moe's Side Channel with 129 (7 percent). The uppermost 3-mile section of the river, between the Fish Barrier Dam and Matthews Riffle, contained 76 percent of the Chinook Salmon redds in the low-flow channel.

## Steelhead

In 2012, a total of 79 steelhead redds were identified during 10 weekly surveys. Steelhead redds were first observed on January 3, with newly constructed redds continuously observed through February 27.

During the 2012 sampling period, 100 percent of steelhead redds were located in the low-flow channel, and 83.5 percent were within 1 mile of the Fish Barrier Dam. This pattern is generally consistent with past steelhead redd surveys and affirms a preference for upstream spawning distribution.

The average depth for all recorded redds was 0.35 meters (1.2 feet) with an average water velocity of 0.47 meters (1.5 feet) per second. The average redd length and width was 1.17 meters (3.8 feet) by 0.86 meters (2.8 feet). Small gravel was the dominant substrate type used by steelhead for redd construction, and overhead cover did not appear to be an important factor for steelhead when selecting a spawning location.



## Salmon Escapement Survey

The purpose of the salmon escapement survey is to evaluate the abundance, distribution, and timing of Chinook Salmon adults spawning in the river.

The survey provides information crucial to monitoring, managing, and conserving the Feather River's salmon populations. The data are used to identify trends in population and age structure, track patterns in spawning distribution, determine proportions of hatchery versus wild fish, and explore environmental effects on salmon survival rates. Estimating the number of salmon returning to spawn is the basic goal of the escapement survey. This estimate is based on a weekly mark and recapture experiment in which salmon carcasses are tagged, chopped, and placed back into the river. The rate at which tagged carcasses are recovered (the recovery rate) relative to the number of carcasses checked for tags (chopped) provides the basis for an estimate of the total spawning population.

The Chinook Salmon spawning escapement survey began September 4 and continued through December 17, 2012. The survey was conducted in the low-flow channel and the high-flow channel from the Table Mountain Bridge downstream to the Gridley Bridge. Due to the low numbers of returning fish in the high-flow channel, the data were pooled with the low-flow channel data to generate one estimate for the lower Feather River.

The carcass mark-recapture study resulted in a spawning population estimate of 63,694 Chinook Salmon for the lower Feather River. There were an estimated 6,159 grilse (fish less than 65 centimeters fork length). These estimates include both fall-run and spring-run Chinook Salmon since their spawning is currently not fully segregated on the Feather River.

Approximately 95.1 percent of the spawning population utilized the low-flow channel. Since 2000, the long-term average for the low-flow channel's spawning population is 73.3 percent. In the low-flow channel, survey section 10 (RM 65.5) had the highest carcass concentration followed by section 8 (RM 66.5). The highest concentrations of carcasses in the high-flow channel were found in sections 34 (RM 53) and 38 (RM 51).

## Spring-run Chinook Salmon Tagging

To better understand spring-run Chinook Salmon life history in the lower Feather River, a program was developed to mark spring-run Chinook Salmon entering FRFH. The spring-run Chinook Salmon tagging program segregates spawning of spring- and fall-run Chinook Salmon in the hatchery. The program also investigates potential differences in spawning distribution and timing of the early arriving spring-run salmon in the river.

Early arriving spring-run salmon entering the hatchery were marked with individually numbered Hallprint dart tags for identification. Once marked, the fish were released back into the river. During the hatchery spawning season, the tags enabled hatchery staff to distinguish the early arriving spring-run fish from the fall-run fish, so that spring-run fish could be spawned separately from the fall-run. The tags also enabled the escapement survey crew to differentiate spring- and fall-run salmon, so that any potential differences or trends in the in-river spawning behavior of the two runs could be analyzed.

In 2012, 7,465 Central Valley spring-run Chinook Salmon were tagged at FRFH. Tagging began on May 29 and ended on July 5. When spawning commenced in the fall, a total of 3,092 tagged fish were recaptured: 1,570 at the FRFH and 1,522 in the river escapement survey.

## Otolith Thermal Marking Studies

The Chinook Salmon run in the Feather River consists of both Central Valley spring-run and fall-run fish, both of which are heavily supplemented by the FRFH. To effectively determine the composition of the run (spring-run versus fall-run) and the origin of the fish (hatchery versus wild), DFW and DWR developed an otolith thermal marking program for the FRFH. Thermal marking is an efficient method to mark 100 percent of the fish produced at the hatchery.

In 2005, 100 percent marking of spring- and fall-run Chinook Salmon began. In 2012, otolith collection and processing continued. With continuation of this program, DWR will be able to definitively determine the origin and the proportions of spring- and fall-run fish within the river and the hatchery. With known origin and race, more advanced otolith analysis techniques can be employed to investigate potential differences in life history strategy for fall- and spring-run fish, as well as hatchery and wild Chinook Salmon. This will provide valuable information to evaluate the effectiveness of past management decisions aimed at the recovery of natural-origin Chinook Salmon and guide future restoration actions.

## Snorkel Surveys

From 1999 to 2001, DWR conducted a snorkel survey focused on juvenile steelhead, but included other species and life stages. In 2010, DWR reinstated the lower Feather River snorkeling surveys with the following objectives:

- (1) determine the relative abundance and distribution of juvenile Chinook Salmon and steelhead prior to habitat improvements;
- (2) identify habitat conditions (depth, substrate, velocity, and cover) where juvenile Chinook Salmon and steelhead occur;

- (3) identify potential sites for gravel supplementation, channel improvement, and structural habitat restoration; and
- (4) identify habitat deficiencies for juvenile Chinook Salmon and steelhead in the lower Feather River prior to habitat improvement implementation.

In 2012, the Feather River Program achieved the objective of determining relative abundance and distributions of age-0 steelhead and salmon prior to habitat improvements. The program also succeeded in quantifying habitat characteristics where juvenile steelhead and salmon occur as well as identifying other high-use areas of the low-flow channel that may benefit from habitat improvements.

In future years, habitat availability will be included to investigate habitat preferences by species and size classes. As habitat restoration projects begin, these and future surveys will guide and improve habitat projects with each iteration.

## Green Sturgeon Studies

This project fulfills some terms and conditions listed in NOAA Fisheries' draft biological and conference opinion for the relicensing of the Oroville Facilities. The primary objectives of this sturgeon study are to:

- determine if there are adult migration barriers;
- evaluate migration patterns including residence times and factors affecting them;
- identify distribution and habitat preferences;
- evaluate the effect of Oroville Facilities operations on passage success and distribution;
- estimate the annual abundance of adult Green Sturgeon;



- determine potential spawning grounds that can be target areas for egg and larval surveys; and
- provide DWR, the Federal Energy Regulatory Commission, NOAA Fisheries, and DFW with data to make management decisions concerning future monitoring programs, operational changes of the facilities, and/or habitat enhancement within the lower Feather River.

In 2012, 34 sonar surveys were conducted between March 20 and August 8. A total of 12 sturgeon images were captured between March 22 and July 11, with the majority of recordings occurring in May. It is believed that 3 or 4 sturgeon were responsible for all of the images captured during the 2012 spawning season. Sturgeon observed at Thermalito Afterbay Outlet (1 fish; 2 observations) and the Shanghai Bend area (2-3 fish; 10 observations) were not clearly identifiable to species (green or white). It is presumed that all the fish left the Feather River in early July because no fish were detected from mid-July through the end of the survey period.

Angling surveys started on July 1 per NOAA Fisheries' request based on concern for induced stress on pre-spawn fish. Unfortunately, this coincided with unseasonably high river flows, which may have caused the sturgeon to emigrate downstream earlier than usual resulting in zero sturgeon being caught and tagged.

Spawning surveys (egg mats/larval sampling) were not conducted in 2012.

### Steelhead Acoustic Tagging

A broad range of restoration and recovery efforts have been initiated in the lower Feather River to bring about the recovery of its steelhead population; however, the ability to measure their success or improve the status of Central Valley steelhead has been hampered by a lack of information

regarding steelhead life history and population dynamics. To address this lack of information, DWR began a tagging program aimed at identifying behavior and life history traits of steelhead spawned at FRFH.

In 2012, an acoustic tagging program was developed to determine the downstream migration success rate for FRFH steelhead released into the Feather River at the Boyd's Pump Boat Launch release site. Using fixed station and mobile acoustic telemetry, DWR tracked the migration of acoustically tagged fish as they left the system.

For this study, 223 hatchery-reared steelhead were surgically implanted with acoustic tags and divided into four separate release groups. Each release group was placed into a much larger group of untagged fish and then transferred by truck to the release site. The first two groups of fish were released at Boyd's Pump Boat Launch on the morning and evening of February 1, 2012. The other two groups were released in the morning and afternoon of February 3, 2012. An array of fixed acoustic receivers placed at 10 to 15 kilometer intervals downstream of the launch site detected 212 tagged steelhead. These receivers were downloaded monthly during mobile roving surveys conducted to locate fish in the reaches between receivers. Movement histories created for each detected fish provided an estimated outmigration success rate for fish leaving the lower Feather River of 37 percent.

## Fish-related Mitigation Projects

In 1986, DWR and DFW signed the Delta Pumping Plant Fish Protection Agreement (Delta Fish Agreement) to annually provide funds to offset direct losses of Chinook Salmon, steelhead, and Striped Bass at Banks Pumping Plant. The Delta Fish Agreement is commonly referred to as the Four Pumps Agreement because it was adopted as part of the mitigation for four

additional pumps at Banks Pumping Plant. Direct losses are defined as losses of fish that occur from the time fish are drawn into Clifton Court Forebay until the surviving fish are returned to the Delta. In principle, DFW and DWR intended this agreement to offset direct losses of all fish caused by the diversion of water by the pumping plant starting in 1986. However, at that time, information on impacts and measures to offset those impacts was sufficient only to deal with Chinook Salmon, steelhead, and Striped Bass. The agreement allowed for addressing impacts on other fish species once impacts could be identified and measures could be developed that would offset such impacts.

The process that led to this agreement included an advisory committee of representatives from interest groups concerned with fish resources affected by the SWP, including, but not limited to, representatives of the SWP water contractors, sport and commercial fishing groups, and environmental groups. The agreement formalized the Delta Pumping Plant Fish Advisory Committee.

To mitigate fish loss, mitigation projects are selected and funded by the Delta Fish Agreement. The agreement outlines how project proposals are reviewed and selected for funding and gives priority to mitigation measures for habitat restoration and other nonhatchery measures. Under the agreement, DWR calculates fish loss as prescribed in the agreement, and approved mitigation projects earn fish mitigation credits to satisfy the fish loss mitigation provisions in the agreement. Mitigation is on a fish-for-fish basis.

DWR and DFW work with the Delta Pumping Plant Fish Advisory Committee to review the success of the agreement in offsetting the direct effects of diversions by Banks Pumping Plant.

The agreement provides for two funding components. One component is the Annual Mitigation Account for compensating the annual fish loss. It has no expiration date. The second is a \$15 million Lump Sum Account provided by DWR for additional projects to compensate for post-1986 fish loss. The agreement specifies that the \$15 million must be expended by December 29, 1996.

The Delta Fish Agreement has been amended three times:

- Amendment 1 (1996)—extended the period to expend the remaining \$9 million of the \$15 million to December 29, 2001.
- Amendment 2 (2001)—extended the period to expend the remaining \$5 million of the \$15 million to December 31, 2004.
- Amendment 3 (2004)—extended the period to expend the remaining \$3.6 million of the \$15 million to December 31, 2007.

Since 1986, DWR has spent \$60 million on mitigation projects developed under the Delta Fish Agreement. Mitigation fund expenditures through December 31, 2012, were \$46.5 million for the Annual Mitigation Account and \$13.5 million for the \$15 million Lump Sum Account. Funds approved but unexpended from each account were \$10 million and \$1.5 million, respectively.

For more information, see DWR's website.

## Climate Change

In this century, climate change will have a dramatic effect on water supply, flood management, and ecosystems. The SWP is particularly vulnerable to changes in climate. For example, climate warming is expected to continue to diminish the natural snowpack and shift reservoir inflows to earlier in the

year when it cannot be stored due to flood control rules. In the future, sea-level rise may also impair DWR's ability to efficiently operate the SWP. For instance, as sea-levels rise, more saline water flows into the Sacramento-San Joaquin Delta, the heart of California's water supply system. To counter this sea water intrusion, additional water may need to be released from reservoirs. Climate change will also exacerbate existing ecological issues in Central Valley rivers and the Delta by raising water temperatures, increasing sediment loading (as a result of increased wildfires and more extreme precipitation events), and increasing water demands.

DWR is committed to contributing to statewide, national, and international efforts to mitigate the future impacts of climate change by reducing greenhouse gas (GHG) emissions from its activities and adapting to unavoidable climate changes. DWR's efforts throughout 2012 represent the continuation of its multipronged approach to addressing these issues by:

- conducting research to better understand potential future impacts;
- monitoring and reporting GHG emissions;
- developing plans, strategies, and actions to improve the resiliency of DWR/SWP facilities and operations;
- reviewing/consulting with outside experts; and
- developing and managing data.

## Completed in 2012

### Planning

#### **DWR Climate Action Plan Phase I: Greenhouse Gas Emissions Reduction Plan.**

In 2012, DWR completed and approved Phase I of the Climate Action Plan. The *Greenhouse Gas Emissions Reduction Plan* documents DWR's progress and future plans for reducing GHG emissions (consistent with the GHG emissions reduction targets established in Assembly Bill 32, Executive

Order S-3-05, and DWR policies) and the steps DWR will take to reduce its emissions by over 80 percent below 1990 levels and monitor its progress toward achieving these reductions.

A CEQA initial study and negative declaration for the plan were completed and approved during 2012. Analysis in the *Greenhouse Gas Emissions Reduction Plan* will serve as a resource in CEQA analyses for future DWR projects.

### Research

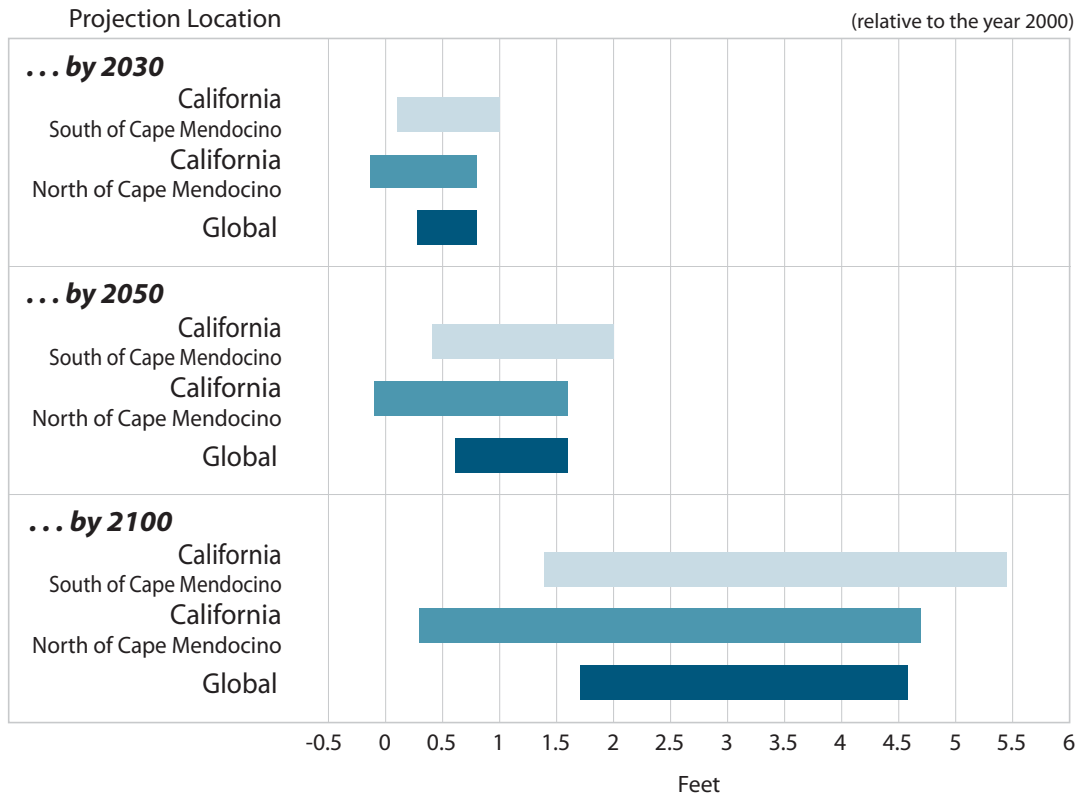
#### **Sea-level Rise on the Coasts of California, Oregon, and Washington.**

In 2010, DWR contracted with the National Research Council to complete a west coast sea-level rise study called for in Executive Order S-13-08. Serving as overall project manager, DWR executed contracts with four other State agencies and with the states of Oregon and Washington for their financial contributions to this west coast sea-level rise study. Three federal agencies—the U.S. Geological Survey, National Oceanic and Atmospheric Administration, and U.S. Army Corps of Engineers—provided a share of the funding directly to the National Research Council. In 2012, the report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*, was completed and released to the public. Figure 3-6 shows the report's best available science estimates of a range of likely local and global sea-level rise in 2030, 2050, and 2100. The report is available on DWR's website.

## Ongoing during 2012

### Research

**Upper Watershed Restoration.** DWR continued to work with the U.S. Forest Service on a study initiated in 2009 to investigate the hydrologic effects of upper watershed restoration. DWR provided funding to the U.S. Forest Service for a 3-year investigation of the hydrologic effects



**Figure 3-6 California and Global Sea-level Rise Projections**

of meadow restoration. Restored meadows can contribute to improved system operation as well as ecosystem functioning and can have beneficial effects on streamflow.

During 2012, the project completed:

- a bibliography of scientific literature pertaining to meadow restoration and hydrology;
- field verification of initial inventories (additional refinements in methods were being used to increase accuracy of meadow delineation using multispectral aerial photographs and satellite imagery); and
- quantification of the extent and degree of meadow erosion by field measurements in a sample of meadows throughout the Sierra Nevada.

Water budget studies for representative meadows were partially completed and will continue in 2013.

**Tree-ring Reconstruction of Paleostreamflows in the Sacramento, San Joaquin, and Klamath River Basins.** Under a contract DWR executed in 2011, the University of Arizona is developing tree-ring reconstructions of paleostreamflows in the Sacramento, San Joaquin, and Klamath River basins. Extending streamflow records beyond the relatively short period of the historical record provides an improved picture of climate variability and yields data for use in operations model sensitivity analyses and for vulnerability analyses. Most of the fieldwork required for the project was completed in 2012; the final report will be completed in 2013. Additionally, with funds provided by Reclamation, the University of Arizona is developing a database of climate analog years for DWR with the paleodata.



### **Sensitivity Analysis of Sierra Nevada Upper Watersheds to Temperature Changes Using the Soil and Water Assessment Tool.**

Physically based, distributed hydrologic models are essential tools for evaluating long-term hydrologic changes in California. The Soil Water Assessment Tool (SWAT) is being used to develop individual models of six representative Sierra Nevada watersheds: the Yuba River, Feather River, and American River in the northern Sierra; and the Tuolumne River, Merced River, and San Joaquin River in the southern Sierra. A common and consistent database of digital elevation, land use, and soil and climate data is used with a geographic information system to develop the SWAT models. Model calibration and validation are based on observed or reconstructed monthly unimpaired streamflows at the watershed outlets.

During 2012, SWAT models for 10 watersheds (Shasta River, Feather River, Yuba River, American River, Merced River, Tuolumne River, Trinity River, Bear River, San Joaquin River, and Putah Creek) were improved and extended from the simulation periods of 1915–2003 to 1915–2010, with new 800 meter resolution PRISM climate data and 1-kilometer resolution DAYMET data. New models for the Cosumnes, Mokelumne, Calaveras, Chowchilla, and Fresno rivers and Stony and Cache creeks were also developed in 2012.

**Reoperation of Water Supply and Flood Protection Systems.** California's water system is composed of State, federal, and local agencies, each having infrastructure in place to provide water supply and flood control benefits. The current operation of these independent systems is based on physical and legal constraints. Changes in the climate, legal framework, and social values associated with water use may require modifications to existing operations and management procedures, new facilities, and new laws.

As authorized in Senate Bill X2 1, DWR initiated a system reoperation study to identify potential reoperation strategies of California's existing water supply and flood protection systems that will optimize the use of existing facilities and groundwater storage capacity. Senate Bill X2 1 defines the following objectives for the System Reoperation Program:

- integrate flood protection and water supply systems to increase water supply reliability and flood protection, improve water quality, and provide for ecosystem protection and restoration;
- reoperate existing reservoirs, flood facilities, and other water facilities in conjunction with groundwater storage to improve water supply reliability, flood control, and ecosystem protection and to reduce groundwater overdraft;
- promote more effective groundwater management and protection and greater integration of groundwater and surface water resource uses; and
- improve existing water conveyance systems to increase water supply reliability, improve water quality, expand flood protection, and protect and restore ecosystems.

In 2012, a plan of study and a list of preliminary reoperation scenarios were developed.

More information on the System Reoperation Program can be found on DWR's website.

### **Review and Consultation**

**DWR Climate Change Technical Advisory Group.** In 2012, DWR empaneled a group of 15 technical experts from academia, local government, and the private sector. Members of the advisory group have expertise in atmospheric science, hydrology, civil engineering/infrastructure, environmental science, climate data and statistics, social science, resource



economics, land-use planning, law, climate modeling, and local water management. The DWR Climate Change Technical Advisory Group began meeting quarterly in 2012 to provide review and consultation on a wide array of climate change related subjects. The Climate Change Technical Advisory Group will continue to advise DWR on the scientific aspects of climate change, its impacts on water resources, the use and creation of planning approaches and analytical tools, and the development of adaptation responses. This standing technical advisory group on climate change impacts and adaptation will serve all DWR programs and provide external guidance and support for a variety of climate-related issues, including scientific review of climate change models and scenarios, interpretation of scientific information produced by the National Climate Assessment and the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, as well as inform DWR's climate change adaptation policies. Benefits include consistency in the scientific advice DWR receives on climate change and the administrative efficiency of not having redundant climate change advisory groups across DWR.

### **Planning**

**Integrated Resource Plan for the SWP.** To help reduce the SWP's reliance on fossil-fired power generation, with its associated adverse impacts, DWR has developed an integrated resource plan for procuring power that will increase the use of renewable energy as part of the SWP's power portfolio, and thereby reduce GHG emissions in California. This plan is consistent with State policy and the goals established by Executive Order S-3-05 (which established GHG emission reduction goals for California).

Accomplishments in 2012 were as follows:

- The Lodi Energy Center was certified in November 2012.

- DWR entered into a contract with Alameda Municipal Power to purchase renewable energy.
- Progress continued on the development of a solar energy system adjacent to the Pearblossom Pumping Plant.
- The Edmonston Pumping Plant pump replacement study (energy efficiency improvements) continued.
- A report about the California Cap and Trade program outlining rules, risks, and opportunities was completed.
- A report was completed on the California SO<sub>2</sub> (sulfur dioxide) market, providing an overview of the market, how it worked, and what lessons can be learned and applied to the California Cap and Trade program.
- A report was completed on intermittent resources and what challenges lie ahead for California load serving entities.
- A report was completed on the federal Acid Rain Program, providing an overview of the market, how it worked, and what lessons can be learned and applied to the California Cap and Trade program.

For additional information, see Chapter 10, Power Resources.

### **Reporting**

**2012 Emissions Reports to The Climate Registry.** Between 2007 and 2009, DWR reported its estimated total direct and indirect GHG emissions to the California Climate Action Registry and earned Climate Action Leader Status each year. In 2010, emissions reporting transitioned to The Climate Registry, which is a North America-wide registry.

DWR's emissions are primarily the result of electricity generation at DWR-owned power plants and power purchase transactions to provide power for operation of the SWP. In 2012, DWR became aware of a systematic methodological problem with the way it

has been accounting for and reporting its emissions to The Climate Registry. The current methodology inaccurately accounts for emissions, resulting in an overstatement of DWR's GHG emissions of approximately 1 million tons per year. During 2012, DWR worked with an independent third party verifier and The Climate Registry staff to revise the methodology and gain approval for an alternative methodology that more accurately reflects DWR's actual emissions and is consistent with GHG accounting done for the DWR *Greenhouse Gas Emissions Reduction Plan*. DWR hopes to have this methodology approved in 2013.

### **Data Development and Curation**

**Formation of DWR Climate Change Basic Data Workgroup.** This workgroup began in 2011, with monthly meetings to strategize on data collection and management issues within DWR. The workgroup is comprised of representatives from the Division of Statewide Integrated Water Management, the Division of Flood Management, and DWR's regional offices. In 2012, the Basic Data Workgroup completed an internal memorandum report on volunteer climate data collection and future recommendations. A partnership with the Western Regional Climate Center was formed to coordinate statewide climate data collection, storage, and dissemination.

### **Initiated during 2012**

#### **Planning**

**DWR Climate Action Plan Phase III: Vulnerability Assessment and Adaptation Plan.** In 2012, DWR initiated work that will review its facilities and activities throughout the State to evaluate vulnerability to key climate change impacts and develop adaptation strategies to improve its resiliency to climate change.

## **Environmental Document Review**

Some environmental documents handled by the State Clearinghouse concern proposed activities that could affect the SWP. Such documents are regularly reviewed to identify any public safety or liability issues arising from the proposed activities.

During 2012, the Division of Environmental Services, Environmental Document Review Section tracked documents related to development along the California Aqueduct, levee encroachment, dam safety issues, water transfers and other water supply issues, wastewater treatment, quarry development, solar and wind power facilities, and climate change issues. Documents including significant climate change issues increased from 2 documents in 2010 (when the State CEQA Guidelines were amended to address GHG emissions pursuant to Senate Bill 97 [2007]) to 12 in 2011 and 19 in 2012.

DWR comments submitted through the CEQA and/or NEPA processes addressed a number of issues, including runoff from proposed developments, safety and water supply, encroachment on physical facilities, impacts to crossdrainage facilities, potential for pollution in SWP water supplies, and impacts to bridges over SWP facilities.

In 2012, the Environmental Document Review Section screened 2,598 State Clearinghouse documents. After screening, 1,136 documents were referred for information, including notices of preparation and various final documents, and 124 formal referrals were made for negative declarations, notices of preparation, EIRs, and NEPA documents.

The Division of Operations and Maintenance received 67 formal referrals and the State Water Project Analysis Office received 12 formal referrals.

The total number of referrals to the Division of Operations and Maintenance and the State Water Project Analysis Office decreased by about 14 percent from 2011. One factor contributing to this decrease was the overall decrease in documents submitted through the environmental process (down about 5 percent), probably related to the continuing effects of the economic downturn.

In 2012, formal referrals to all other DWR reviewers, including the Central Valley Flood Protection Board and the Division of Dam Safety, were down 6 percent from 2011. This reduction may be relatively insignificant since the total number of referrals was small when compared to the total number of documents (56 were referred in 2010, 48 in 2011, and 45 in 2012).





## Chapter 4 Water Quality Programs

*At Bryte Chemical Laboratory, water samples are routinely analyzed for inorganic and organic constituents.*



## Significant Events in 2012

The State Water Resources Control Board (SWRCB) initiated Phase 2 of the review of the 2006 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* with three public workshops held in fall 2012.

Recent amendments to the Central Valley Regional Water Quality Control Board's Sacramento-San Joaquin Delta Basin Plan established the Delta Mercury Control Program (DMCP) to address mercury and methylmercury impairments in the Delta. The program identified the Department of Water Resources' (DWR) responsibility for reducing loads of methylmercury (MeHg) and total mercury (tHg) in the Delta and Yolo Bypass. The newly formed Mercury Monitoring and Evaluation Section was established in DWR's Division of Environmental Services.

*Information in this chapter was contributed by the Division of Environmental Services, the Division of Operations and Maintenance, and the State Water Project Analysis Office.*

The State Water Project (SWP) is the largest state-built, multipurpose water project in the United States. California's existence and continued prosperity depends on water. More than two-thirds of the people of California rely partly or wholly on the SWP for their daily water needs. The Department of Water Resources (DWR), Division of Operations and Maintenance currently maintains 16 automated water quality monitoring stations at key locations along the SWP. This network of automated stations continuously monitors a variety of water quality parameters throughout the system and provides real-time data to SWP water contractors. In addition, field grab samples collected weekly, monthly, quarterly, or annually from more than 30 SWP locations are routinely analyzed for a broad range of constituents at the State's Bryte Chemical Laboratory.

## Delta Water Quality

Maintaining adequate water quality to support multiple beneficial uses of water from the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) is of concern to DWR as well as other resource agencies. The State Water Resources Control Board (SWRCB) establishes water quality objectives to protect a variety of beneficial uses of water within the Bay-Delta. The objectives are contained within the water quality control plans (WQCPs) adopted by the SWRCB. Water quality objectives are also contained in Article 19 of the long-term SWP water supply contracts. The California Department of Public Health (CDPH) establishes maximum contaminant levels for treated drinking water.

Under its authority to protect beneficial uses of water, the SWRCB adopted the 2006 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) on December 13, 2006 (Resolution No. 2006-0098). It contains objectives for flow, salinity, dissolved oxygen (DO) levels, and other parameters necessary for protection of various beneficial uses such as municipal and industrial, agricultural, and fish and wildlife.

The SWRCB adopted Water Right Decision 1641 (D-1641) in December 1999 (amended March 15, 2000). D-1641 implemented the objectives of the 1995

Bay-Delta Plan. One method used by the SWRCB to implement the objectives in the WQCPs is through conditioning water rights permits. D-1641 amends the water rights of a number of water rights holders—primarily those for the SWP and Central Valley Project (CVP)—to help achieve the WQCP objectives.

For additional background information about the SWRCB's activities and the Bay-Delta Plan, see the sidebar, State Water Resources Control Board, and Chapter 7, Water Supply Development and Reliability.

## 2006 Bay-Delta Plan Review

Water Code Section 13240 requires that the WQCP be periodically reviewed. Federal Clean Water Act Section 303(c) (33 U.S.C. Section 1313(c)) requires a triennial review of State water quality "standards," as defined in the act.

The WQCP review and amendment process consists of review of the Bay-Delta Plan to identify elements that may need amendment or new elements that may need to be added, staff preparation of any amendments or revision of the entire WQCP, and SWRCB adoption of some or all of the amendments or revisions. SWRCB information-gathering activities may affect the scope of the WQCP review and may include a series of evidentiary hearings on critical issues concerning the Delta's ecology.

## State Water Resources Control Board

The State Water Resources Control Board (SWRCB), established by the California Legislature in 1967, oversees water rights and protects water quality by setting and implementing statewide policy, administering appropriate water rights, coordinating with and supporting Regional Water Quality Control Board (RWQCB) efforts, and reviewing petitions that contest RWQCB actions. The five SWRCB members are appointed by the Governor and confirmed by the Senate. SWRCB is responsible for four major programs.

Water quality: to preserve, protect, enhance, and restore water quality.

Water rights: to issue permits for water rights specifying amounts, conditions, and construction timetables for diversion and storage.

Financial assistance: to assist local agencies and individuals with pollution prevention or clean-up.

Enforcement: to enforce water rights and water quality laws and regulations.

Under their water quality authority, the SWRCB and RWQCBs adopt water quality control plans (WQCPs) for each of the planning basins in the State. The WQCPs contain water quality objectives for flow, salinity, dissolved oxygen levels, and other parameters necessary for the protection of various beneficial uses, such as municipal and industrial, agricultural, and fish and wildlife. The SWRCB implements these objectives in a number of ways, depending on the circumstances, including imposing conditions on water right permits and licenses.

The SWRCB amended Water Right Decision 1641 (D-1641) on March 15, 2000, which placed terms and conditions on a number of water rights, primarily those for the State Water Project (SWP) and Central Valley Project (CVP). D-1641 implemented the objectives in the 1995 Bay-Delta Plan. The Department of Water Resources and the Bureau of Reclamation operate the SWP and CVP in coordination to meet the terms in D-1641 and other applicable regulatory requirements relevant to each project.

Current water quality objectives for the Sacramento-San Joaquin Delta and Suisun Marsh are contained in the *WQCP for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan), adopted December 13, 2006. The SWRCB is required to conduct periodic updates of the Bay-Delta Plan. As part of the update process, the SWRCB conducts proceedings to gather information, receive recommendations, consider public comments, and facilitate detailed discussions to evaluate new information relevant to potential changes to the water quality objectives.

Some of the recent issues of concern related to the WQCP include pelagic organism decline, special status fish species, Delta inflow, San Joaquin River flows, and southern Delta salinity.

In July 2008, the SWRCB adopted the *Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, which prioritizes and describes the scope of individual activities and provides specificity regarding timelines and resource needs for implementing coordinated activities in the Bay-Delta.

Review of the 2006 Bay-Delta Plan began in 2008. The review includes both the review and update of water quality objectives (including flow objectives) and the program of implementation in the Bay-Delta Plan, as well as changes to water rights and water quality regulation consistent with the program of implementation. In SWRCB's 2009 notice of preparation of environmental documentation for the comprehensive update and implementation of the Bay-Delta Plan, SWRCB anticipated it would stage components of its environmental review of the Bay-Delta Plan and the environmental review for potential changes to water rights and other measures needed to implement any revisions to the Bay-Delta Plan. The notice of preparation indicated the work could be completed in four stages.

In 2012, SWRCB continued the phased review and update of the 2006 Bay-Delta Plan.

Phase 1 includes review and potential modification of the San Joaquin River flow objectives for the protection of fish and wildlife beneficial uses, the southern Delta water quality objectives for the protection of agricultural beneficial uses, and the program of implementation for those objectives. In 2012, Phase 1 continued with the release (in December) of the draft substitute environmental document for public review and comment. The substitute environmental document provides analysis of the potential environmental impacts of the proposed alternatives for revisions to the objectives for southern Delta salinity and San Joaquin River flows and the program of implementation for those objectives.

Phase 2 includes the review and potential modification of Delta outflows, SWP and CVP export restrictions, and other requirements in the Bay-Delta to protect fish and wildlife beneficial uses. Phase 2 was initiated with three public workshops in fall 2012. The workshops were held to receive information

and conduct discussions regarding the scientific and technical basis for considering potential changes to the 2006 Bay-Delta Plan. The workshop topics were ecosystem changes and the low-salinity zone, Bay-Delta fishery resources (focused on pelagic fishes and salmonids), and analytical tools for evaluating the water supply, hydrodynamic, and hydropower effects of the Bay-Delta Plan.

## Operations Under D-1641

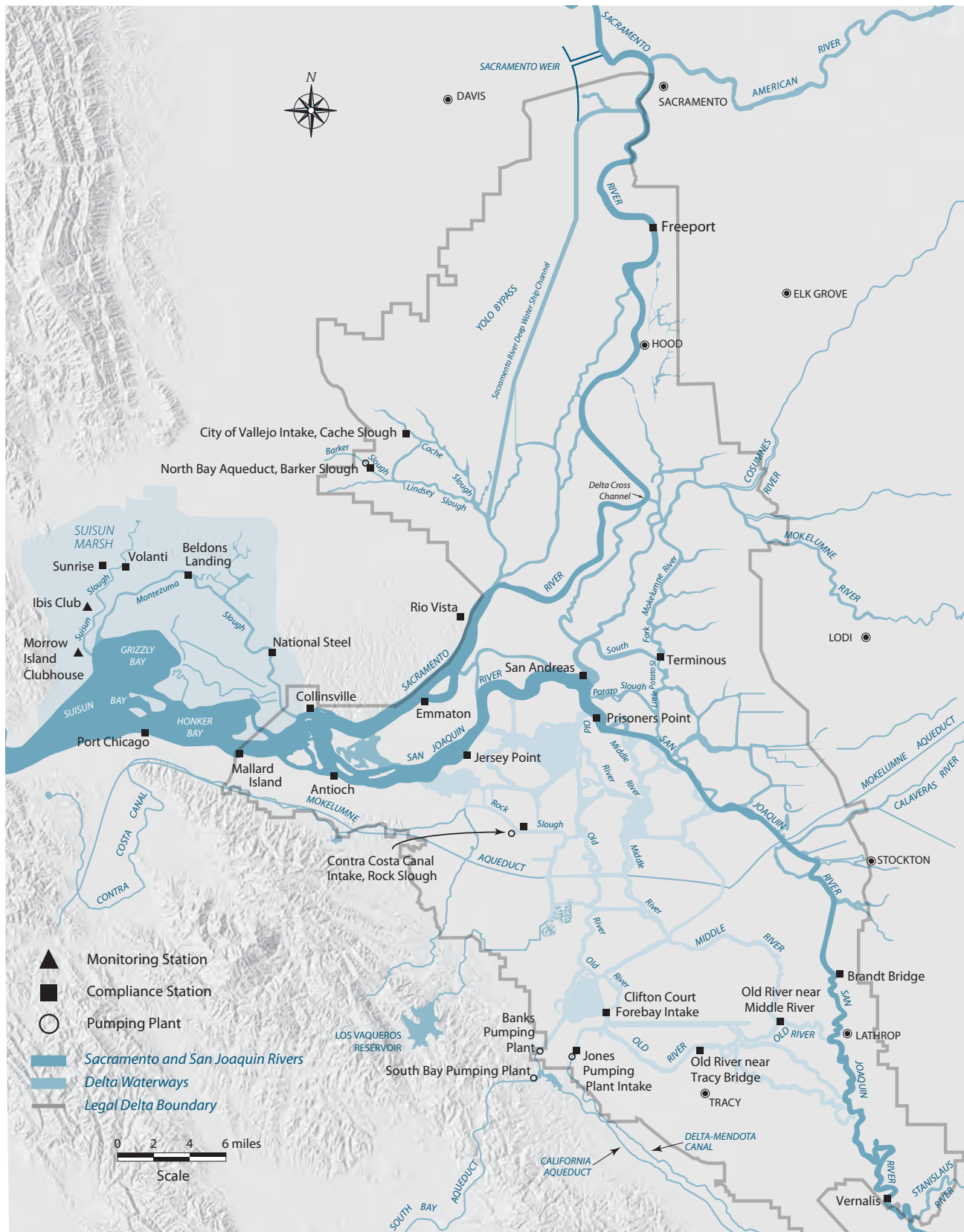
In 2012, DWR and the Bureau of Reclamation (Reclamation) jointly operated the SWP and CVP in accordance with D-1641, which includes water quality, flow, and operational criteria for the SWP and CVP Delta operations. SWP and CVP operations were coordinated to meet the various objectives of the Bay-Delta Plan, Central Valley Project Improvement Act, and biological opinions (BOs) for listed species as well as other regulatory requirements. Fish species currently listed under the Endangered Species Act and the California Endangered Species Act include the winter and spring runs of Chinook Salmon, Delta Smelt, steelhead, and Green Sturgeon.

Real-time monitoring of fish movement and conditions in the estuary aids daily water management and provides timely protection of targeted fish species from entrainment at the Delta pumping facilities.

D-1641 includes the requirement to monitor a number of stations within the Delta for specific water quality constituents. DWR conducts extensive monitoring in the Delta and the Suisun Marsh, as required. Figure 4-1 shows water quality compliance and monitoring stations throughout the Sacramento-San Joaquin Delta specified by D-1641.

For a discussion of other environmental issues, see Chapter 3, Environmental Programs.





**Figure 4-1 D-1641 Water Quality Compliance and Monitoring Stations in the Sacramento-San Joaquin Delta**



## Delta Cross Channel Gates

The Delta Cross Channel gates are operated in accordance with SWRCB D-1641. In 2012, the gates were open for 168 days to allow fresher Sacramento River water to flow into interior Delta channels toward the SWP and CVP export facilities. Reclamation's standard operating procedures call for gate closure when flow on the Sacramento River at Freeport reaches between 20,000 cubic feet per second (cfs) and 25,000 cfs to reduce flooding potential on the Mokelumne River and to prevent scouring on the downstream side of the gate structure. D-1641 contains measures that require gate closure under certain conditions from November 1 through May 20 for fisheries protection as requested by the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service, and the Department of Fish and Wildlife (DFW).

## Water Quality Standards

Water quality objectives in D-1641 are categorized by the beneficial uses they are intended to protect, including municipal and industrial, agricultural, and fish and wildlife. DWR operators adjust upstream releases and Delta exports to meet D-1641 water quality and flow standards. D-1641 contains salinity standards (recorded as electrical conductivity [EC]) for three stations in the South Delta downstream of Vernalis. The stations are primarily influenced by San Joaquin River flows and in-Delta diversions. San Joaquin River flows are not influenced by SWP upstream reservoirs, but local water levels may be influenced by SWP exports, and circulation may be influenced by the annual placement of South Delta barriers.

For more information about the South Delta barriers, see Chapter 2, Delta Resources, and Chapter 3, Environmental Programs.

## Water Year 2011–2012 Classifications and Water Supply Indices

SWRCB's D-1641 contains water quality and flow standards that are conditioned by water year type and generally become less stringent in years with less precipitation. The water year classification system provides relative estimates of a basin's available water supply based on the amounts of rainfall, snowmelt runoff, and groundwater accretion rates. Water year types are classified as "wet," "above normal," "below normal," "dry," or "critical."

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) forecast on May 1 of each year determines the water year type for the implementation of flow and water quality criteria contained in D-1641. In 2012, the SWP and CVP were operated using water quality and flow criteria based on the May 1 forecast of a below normal water year for the Sacramento River basin.

The Sacramento Valley 40-30-30 Index was below normal, and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) was dry, based on observed data for water year 2011–2012.

For a detailed discussion of water year 2011–2012, see Chapter 8, Water Supply.

## Municipal and Industrial Objectives

D-1641 includes a year-round 250 milligrams per liter (mg/L) (maximum mean daily) chloride objective that is in effect at Delta export locations (Contra Costa Canal Pumping Plant No. 1, Clifton Court Forebay, Jones Pumping Plant, Cache Slough at the City of Vallejo Intake, and Barker Slough). Chloride levels remained below the objective for all days in 2012.

An additional municipal and industrial water quality objective for chloride at the Contra Costa Canal Intake, near Rock Slough, specifies that the chloride level must be below 150 mg/L for a given number of days during the year, dependent upon the water year forecast. This objective was met in calendar year 2012.

### Agricultural Objectives

D-1641 contains agricultural salinity objectives, which vary by location. The salinity objectives, recorded as EC, are based on both water year type and a 14-day running average during the irrigation season, from April to mid-August, at Emmaton, Jersey Point, Terminous, and San Andreas in the West and Central Delta. The agricultural salinity objectives at these Delta locations become less stringent under dryer conditions. These objectives were met in calendar year 2012.

In the South Delta, the salinity objectives are based on a 30-day running average. The 0.7 millisiemens per centimeter (mS/cm) objective for the South Delta was met at Vernalis, Old River near Middle River, and Brandt Bridge. The objective was not met at Old River near Tracy Road Bridge. The SWP and CVP are jointly required by D-1641 to meet the agricultural EC objectives imposed at these South Delta compliance locations.

See also, Chapter 2, Delta Resources, and Chapter 7, Water Supply Development and Reliability.

### Estuarine Habitat Protection Standard

The estuarine habitat protection standard incorporates modified X2 criteria (geographic isohaline) first established in the 1994 Delta Smelt BO. The upstream movement of 2 parts per thousand isohaline (2 parts per thousand of salt in the water), measured as 2.64 mS/cm at the surface, is maintained within a certain range of positions in the

estuary by adequate Delta outflow. These positions (Collinsville, Chipps Island, Port Chicago, or Martinez) are associated with an abundance of fish and biota.

The requirement for meeting X2 criteria at Collinsville applies to all days during February through June. The number of days per month when the daily average EC maximum (2.64 mS/cm) is in effect at Chipps Island or Port Chicago is conditioned by the previous month's Eight River Index (more information about this can be found in Chapter 8, Water Supply). This may alternately be met with a maximum 14-day running average EC of 2.64 mS/cm or with specific Delta outflow, set as a 3-day average Net Delta Outflow Index (NDOI) of 7,100 cfs, 11,400 cfs, or 29,200 cfs, when the X2 position is at Collinsville, Chipps Island, or Port Chicago, respectively. The Port Chicago standard becomes effective when the Port Chicago 14-day EC average, immediately prior to the first day of the month, is less than or equal to 2.64 mS/cm.

The Eight River Index for January through May 2012, in million acre-feet, was 0.96, 0.74, 3.03, 3.70, and 2.27, respectively. The X2 habitat protection objective at Chipps Island was 22 days in February, 0 days in March, 30 days in April, 31 days in May, and 0 days in June. The X2 habitat protection objective at Port Chicago was 11 days in May. These objectives were met in calendar year 2012.

### Net Delta Outflow Index Standard

Delta outflow cannot be measured directly due to the tidal influence in the Delta. Instead, an approximation of Delta outflow is calculated using measured inflows, exports, and estimated Delta water use. The NDOI was introduced in the 1995 Bay-Delta Plan and is now part of D-1641. NDOI calculates Delta outflow using inflows of the Sacramento River, the Yolo Bypass system, the eastside stream system (consisting of the Mokelumne, Cosumnes, and Calaveras

ivers), the Sacramento Regional Treatment Plant, and a measurement of San Joaquin River flow at Vernalis.

Excess outflow conditions, as defined by the Coordinated Operations Agreement, allow for greater flexibility in project operations.

D-1641 sets specific minimum monthly NDOI standards for the protection of fish and wildlife based on water year type. In 2012, the monthly mean NDOI was highest in December, averaging 47,326 cfs. The lowest monthly mean NDOI occurred in October, with 4,548 cfs. All NDOI standards were met in 2012.

### River Flow Standards

D-1641 includes minimum flow requirements measured in the Sacramento River at Rio Vista. These flow standards, incorporated from the winter-run salmon BO, set flow requirements based on the Sacramento Valley water year classification. Water year 2011–2012 was below normal, requiring mean monthly flows of 4,000 cfs for October and 4,500 cfs for November and December. During these periods, the 7-day running average could not be more than 1,000 cfs below the monthly standard. The actual mean monthly flows were 5,162 cfs for September; 4,548 cfs for October; 5,877 cfs for November; and 47,326 cfs for December.

D-1641 also specifies minimum flow requirements measured in the San Joaquin River at Vernalis. These flow standards are based on the San Joaquin Valley water year classification, which was dry for water year 2011–2012. If the X2 objective is required to be at or west of the Chipps Island location, dry year base Vernalis flows are set at 2,280 cfs from February to April 14 and from May 16 through June 30. The base-flow objective is relaxed to 1,420 cfs when X2 is required to be east of Chipps Island.

D-1641 requires the San Joaquin River spring pulse flow for April 15 to May 15 at Vernalis.

This spring pulse flow requirement varies based on the location of X2 during April. However, the CALFED Operations Group may vary the actual timing and duration of the pulse attraction flow based on real-time monitoring data.

Additional information about San Joaquin River water quality can be found in Chapter 5, Local Assistance.

### Export Standards

D-1641 includes an export limitation for the SWP and CVP. It limits Delta exports to a ratio of Delta inflow to combined water project exports and is expressed as a maximum export rate in percentage of Delta inflow. The maximum percentage of diverted Delta inflow varies by month; for example, in February, it is conditioned by the previous month's Eight River Index. During the 2012 San Joaquin River spring pulse flow season, the 2009 National Marine Fisheries Service BO, Action IV.2.1 export rates were used as an alternative to the D-1641 spring export limitation.

The actual export amount is calculated using the 3-day average that combines the inflow rate for Clifton Court Forebay (excluding Byron-Bethany Irrigation District diversions from Clifton Court Forebay) added to the Jones Pumping Plant diversion. The export-to-inflow ratio limit is reported as either a 3-day or 14-day running average. A 14-day running average of inflows is used unless storage withdrawals from upstream reservoirs are being made for export, in which case a 3-day average of inflows is used. In all water year types, the maximum combined export rate from February through June is 35 percent of Delta inflow. This rate may be relaxed in February during years with less precipitation to between 35 and 45 percent. From July through January, the export-to-inflow ratio rises to 65 percent.

During 2012, the Delta was in excess conditions from February 27 to June 6 and



December 1 to December 31, for a total of 142 days. Within this period, combined SWP and CVP exports averaged about 15 percent of Delta inflow, meeting the 65 percent limitation in January and from July to December, while also meeting the 35 percent limitation from February to May.

The Delta was in balanced conditions for 234 days from January 1 to February 26 and June 7 to November 30. Within this period, combined SWP and CVP exports averaged about 41 percent of Delta inflow, meeting the 65 percent limitation.

## South Delta Temporary Barriers Project

The South Delta Temporary Barriers Project, initiated as a test project in 1991, was extended for 5 years in 1996, and extended again for 7 years in 2001. The project was created partially in response to a 1982 lawsuit filed by the South Delta Water Agency and consists of rock barriers across four South Delta channels.

These temporary seasonal barriers are designed to improve local water levels and circulation patterns, protect fishery resources, and improve water quality. They are placed across Middle River, Old River near Tracy, Grant Line Canal, and at the Head of Old River.

For more information about the temporary barriers, see Chapter 2, Delta Resources, and Chapter 3, Environmental Programs.

## Delta Mercury Control Program and Mercury Monitoring and Evaluation

### Background

To address mercury contamination in the Delta and Yolo Bypass, the Central Valley Regional Water Quality Control

Board (RWQCB), adopted amendments to the Sacramento-San Joaquin Delta Basin Plan to establish the Delta Mercury Control Program (DMCP) to address mercury (Hg) and methylmercury (MeHg) impairments in the Delta. In October 2011, the U.S. Environmental Protection Agency approved the Basin Plan amendments, thus establishing the effective date and a compliance schedule. The DMCP identifies DWR as a regulated entity responsible for reducing loads of MeHg and total mercury (tHg) in the Delta and Yolo Bypass.

The DMCP required a new DWR program approved in 2011. The newly formed Mercury Monitoring and Evaluation Section was established in the Division of Environmental Services.

The DMCP includes fish tissue objectives for the Delta and MeHg load allocations for DWR activities related to: (1) nonpoint sources, including tidal and managed wetlands and irrigated agriculture; (2) open water, including SWP operations and management of flood conveyance flows; and (3) dredging and dredge-material reuse. The DMCP also requires DWR participation in a mercury Exposure Reduction Program, aimed at raising awareness of fish contamination issues among those most likely affected by mercury in Delta fishes. SWP activities primarily affected by the DMCP include the direct operation of the SWP and other aquatic restoration and enhancement project activities that are required for compliance with the CVP and SWP Long-term Operations Criteria and Plan BOs, the SWP Longfin Smelt incidental take permit, and the Fish Restoration Program Agreement. MeHg management will also be part of Bay Delta Conservation Plan conservation measures. The DMCP impacts DWR through a number of regulatory avenues. These include the Central Valley RWQCB's regulatory authority over water quality certifications; the irrigated lands regulatory program, of which DWR is a member; general discharge requirements for dredging; and other water rights regulations.

The DMCP uses a phased approach towards compliance. In Phase 1, regulated entities are required to develop control measures to minimize the discharge of MeHg. A work plan is due April 20, 2013, in which regulated entities must outline control measure studies to be completed during Phase 1. The goal of control studies is to evaluate either existing or proposed control strategies to determine their effectiveness in controlling mercury methylation. In some cases, characterization of mercury processes can also be evaluated. Phase I runs through approximately October 2020. At the end of Phase 1, the Central Valley RWQCB may recalculate MeHg load allocations based on data collected from these studies. In Phase 2, regulated entities must implement the developed control measures to decrease loads of MeHg.

## Work Completed

Mercury Monitoring and Evaluation Section staff and other regulated entities have formed workgroups focused on developing and implementing Phase I control study work plans. Although the deadline for work plan submittals is April 20, 2013, no work can be done until the work plans are approved by the regional board. The Central Valley RWQCB has convened a technical advisory committee consisting of national mercury experts to advise them on the work plans. Therefore, while the work plans articulate proposed studies, they are subject to revision.

DFW and DWR are required to develop control measures to minimize the discharge of MeHg from wetlands. The majority of studies have been done on managed wetlands, however, potentially, tens of thousands of acres of wetlands will be restored throughout the Yolo Bypass and Delta through programs such as the Bay Delta Conservation Plan and Fish Restoration Program Agreement. Future restoration efforts will focus heavily on tidal wetlands rather than managed wetlands, yet little information is known about tidal wetland

production of MeHg. Additionally, before control measures can be developed and implemented, it must be resolved whether tidal wetlands are net sources or sinks of MeHg, and by what magnitude. Once these dynamics are understood, the Central Valley RWQCB can use the information to determine whether or not control measures are necessary and potentially adjust allocations. Therefore, DWR is partnering with DFW to develop two work plans that focus on further characterizing MeHg in individual tidal wetlands and a second study to regionally characterize MeHg in tidal wetlands in the lower Yolo Bypass. The first work plan proposes to determine if tidal wetlands are net sources or sinks of MeHg and tHg, calculate the loads of MeHg and tHg imported and exported from tidal wetlands, and provide data to the Central Valley RWQCB for a revision of the MeHg allocation. The goals of the second work plan are to determine if the lower Yolo Bypass is a net source or sink of MeHg and tHg, determine major source and sink processes for MeHg in the lower Yolo Bypass, and provide data to the Central Valley RWQCB for a revision of the MeHg allocation. Staff are also participating in the Nonpoint Source Workgroup, which provides nonpoint dischargers with an organizational structure for developing collaborative control studies.

In the case of open waters and floodwaters in the Yolo Bypass, DWR has formed an Open Water Workgroup, consisting of DWR, the Central Valley Flood Protection Board, the State Lands Commission, the U.S. Army Corps of Engineers, and Reclamation. Because it is infeasible to conduct control studies to determine how current or proposed operational changes impact MeHg and tHg processes, the workgroup is developing a work plan that uses a modeling approach to understand the impacts of project operations and flood waters on MeHg production. Part of this proposed work will include sampling in the Yolo Bypass



to support the modeling effort. Staff have worked with DWR and SWP modelers to choose the best model(s) and to identify potential qualified modeling consultants. The State Water Contractors have provided some funding to hire a consultant to provide mercury expertise.

A dredging work plan is due to the Central Valley RWQCB by October 20, 2013. Staff are compiling a list of all dredging activities in DWR and researching what control studies will be required to cover DWR dredging and dredge-material reuse activities.

For the first two fiscal years of this program, approximately \$300,000 of the program's operating budget is being provided by the California Environmental License Plate Fund. This funding augments SWP funding for the program. Staff have completed a contract between DWR and the Moss Landing Marine Laboratory for analytical, sampling, and consulting support.

Staff anticipate submitting completed work plans to the Central Valley RWQCB for approval in 2013. Upon approval, Mercury Monitoring and Evaluation Section staff will begin the studies outlined in the work plan and hire the mercury modeling consultant. Additionally, staff anticipate that resource agreements will be produced with DWR modelers and staff within North Central Region for DSM2 (Delta Simulation Model 2) modeling and sampling support, respectively.

## Special Study and Biological Surveys

DWR conducts several special studies and biological surveys each year. This includes a special study in the Stockton Deep Water Ship Channel (DWSC) during the late summer and early fall to monitor the occurrence of low DO levels. Low DO levels potentially cause physiological stress to fish and block the migration of salmon into the San Joaquin River. DWR also conducts

biological surveys of benthic organism density and diversity and of phytoplankton biomass and community composition in the Sacramento-San Joaquin Delta, Suisun Bay, and San Pablo Bay.

## Fall Dissolved Oxygen Study in the Stockton DWSC

Historically, during the late summer and early fall, DO levels in the eastern and central portions of the Stockton DWSC have dropped below both the 5.0 mg/L and 6.0 mg/L water quality objectives set by SWRCB and the RWQCB, respectively. These low DO levels are a result of several factors, including low San Joaquin River inflows, warm water temperatures, high biochemical oxygen demand, reduced tidal circulation, and intermittent reverse flow conditions in the San Joaquin River at Stockton.

To help reduce the severity of these low DO conditions, DWR normally installs a temporary rock barrier across the Head of Old River during periods of projected low fall flows in the San Joaquin River.

In 2012, installation of the spring barrier began on March 15 and was completed by April 11. Removal of the spring barrier began June 1 and was completed by June 20. The fall Head of Old River barrier was not installed in 2012 because the existing flows and DO levels in the San Joaquin River were sufficient for Chinook Salmon, and it was not requested by DFW.

### Methods

Monitoring DO concentrations in the Stockton DWSC was conducted by boat on 12 monitoring runs, from June 4 to November 15, 2012. During each run, 14 sites were sampled at low-water slack tide from Prisoners Point in the Central Delta to the Stockton Turning Basin at the terminus of the ship channel. Because monitoring results differ within the channel, sampling stations were grouped into

western, central, and eastern regions. The western region of the channel begins at Prisoners Point and ends at Columbia Cut. The central region of the channel begins one-half mile east of Columbia Cut and ends at Fourteen Mile Slough. Finally, the eastern region of the channel begins at Buckley Cove and ends at Rough and Ready Island. The turning basin is unique within the channel because it is east of the entry point of the San Joaquin River into the channel and isolated from down-channel flows.

### Results

During the period of this study (June 4 to November 15), DO levels varied by season and exhibited similar ranges between regions within the channel excluding the turning basin. Overall study period range was 4.9 to 11 mg/L at the surface and 3.9 to 10.3 mg/L at the bottom. In the western portion of the channel, DO concentrations ranged from 7.5 to 10.8 mg/L at the surface and 7.2 to 10.2 mg/L at the bottom. In the central portion of the channel, DO concentrations were variable, ranging from 5.6 to 11 mg/L at the surface and 5.7 to 10.3 mg/L at the bottom. In the eastern portion of the channel, DO levels tended to be more stratified than the other stations, ranging from 4.9 to 8.2 mg/L at the surface and 3.7 to 8 mg/L at the bottom. DO concentrations fell below the State's 5.0 mg/L objective 11 times during 2012, twice at the surface and 9 times at the bottom. All of these occurrences were in the eastern channel. DO concentrations fell below the State's 6.0 mg/L objective 8 times, once at the surface and 7 times at the bottom. One occurrence was in the central channel at the bottom, and the rest were in the eastern channel.

Higher San Joaquin River inflows, as well as the absence of intermittent reverse flows near Stockton, coincided with improved DO conditions. Further monitoring operations for the fall 2012 special study were suspended after November 15, 2012.

### Benthic Survey

The operation of the SWP can impact flow characteristics of the upper San Francisco Estuary and subsequently influence the density and distribution of benthic biota. Benthic biota are relatively long-lived and can respond to changes in physical factors within the estuary, such as fresh water inflows, salinity, and substrate composition. The benthic monitoring program documents changes in the composition, abundance, density, and distribution of the benthic biota within the estuary. Biological surveys conducted under the benthic monitoring program provide an indication of physical changes occurring within the upper estuary. In addition, benthic monitoring data are also used to detect and document the presence of newly introduced species within the upper estuary.

Benthic monitoring was conducted at 10 sampling sites distributed throughout the major habitat types within the estuary:

- Clifton Court Forebay Intake;
- San Joaquin River at Buckley Cove and at Twitchell Island;
- Old River opposite Rancho del Rio;
- Sacramento River below the Rio Vista Bridge and above Point Sacramento;
- Suisun Bay at Bulls Head Point;
- Grizzly Bay at Dolphin near Suisun Slough; and
- San Pablo Bay near Pinole Point and near the mouth of the Petaluma River.

Four bottom grab samples for benthic analysis and one sample for sediment analysis were collected monthly at each site during 2012. Samples were analyzed to identify organisms to the lowest possible identifiable taxon and to count all organisms collected.

DWR maintains a database of benthic organisms located within the upper estuary.

The benthic database is dynamic and regularly undergoes peer review and update. When a new organism is identified at any of the sampling stations it is added to the database. In addition, the taxonomic names of organisms on the list are updated when sufficient evidence is produced to warrant such changes.

The benthic monitoring program collects a large number of organisms, but a relatively small number of species. A total of 187 species of benthic macrofauna were collected in 2012 at the 10 sampling sites. Of the 187 species, 10 represented 85 percent of all organisms collected:

- amphipods: *Ampelisca abdita*, *Americorophium spinicorne*, *Americorophium stimpsoni*, *Corophium alienense*, and *Gammarus daiberi*;
- Asian clams: *Potamocorbula amurensis* and *Corbicula fluminea*;
- sabellid polychaete: *Manayunkia speciosa*; and
- tubificid worms: *Limnodrilus hoffmeisteri* and *Varichaetadrilus angustipenis*.

Of the 10 dominant species, *Potamocorbula amurensis* and *Ampelisca abdita* represent macrofauna that inhabit a typically high saline environment and were found in San Pablo Bay, Suisun Bay, and Grizzly Bay. *Corophium alienense*, *Americorophium spinicorne*, and *A. stimpsoni* tolerate a wider range of salinity. They were collected both in the higher saline western sites and the more brackish to fresh water eastern sites such as the San Joaquin River at Twitchell Island and the Sacramento River above Point Sacramento. The remaining five species, *Gammarus daiberi*, *Manayunkia speciosa*, *Limnodrilus hoffmeisteri*, *Varichaetadrilus angustipenis*, and *Corbicula fluminea*, are predominantly fresh water species and were collected at sites east of Suisun Bay.

## Phytoplankton and Chlorophyll *a* Survey

Phytoplankton are small, free-floating or attached algae that can be tiny, single-celled organisms (less than 5 micrometers in diameter) or larger colonial organisms. Phytoplankton are an important source of food in the estuary for zooplankton, invertebrates, and some species of fish. Phytoplankton biomass is an indicator of the status of primary productivity in the estuary. Chlorophyll *a* is one of the main groups of pigments contained in the algal species that make up phytoplankton.

Monthly sampling of chlorophyll *a* concentrations and phytoplankton was conducted in 2012 by DWR's Bay-Delta Monitoring Branch at 13 stations throughout the upper San Francisco Estuary:

- Sacramento River at Greene's Landing/Hood and above Point Sacramento;
- San Joaquin River at Vernalis, Buckley Cove, and Potato Point;
- Old River opposite Rancho del Rio;
- Disappointment Slough near Bishop Cut;
- Frank's Tract near Russo's Landing;
- Suisun Bay at Bulls Head Point near Martinez and off Middle Point near Nichols;
- Grizzly Bay at Dolphin near Suisun Slough; and
- San Pablo Bay near Pinole Point and near the mouth of the Petaluma River.

Chlorophyll *a* concentration was measured at the 13 monitoring stations to estimate overall phytoplankton biomass in the estuary. Phytoplankton samples were collected and analyzed separately to determine which species were present in the estuary.

Monthly chlorophyll *a* concentrations throughout much of the estuary were relatively low. Of the 156 samples taken



in 2012, 93.6 percent (146 samples) had chlorophyll *a* levels below 10 micrograms per liter ( $\mu\text{g/L}$ ). Chlorophyll *a* levels below  $10 \mu\text{g/L}$  are considered limiting for zooplankton growth. Of the 10 samples with chlorophyll *a* concentrations above  $10 \mu\text{g/L}$ , one was from Suisun Bay off Middle Point near Nichols in May, and the rest were from the San Joaquin River at Vernalis from March through November. The mean chlorophyll *a* concentration for all samples in 2012 was  $5.04 \mu\text{g/L}$ ; the median value was  $2.08 \mu\text{g/L}$ . In 2011, the mean was lower ( $3.22 \mu\text{g/L}$ ), but the median was similar ( $2.26 \mu\text{g/L}$ ). The maximum chlorophyll *a* concentration in 2012 was  $131 \mu\text{g/L}$ , recorded in July on the San Joaquin River at Vernalis. It was much higher than the maximum in 2011 ( $18.20 \mu\text{g/L}$ ). The minimum chlorophyll *a* concentration was  $0.26 \mu\text{g/L}$ , recorded in December on Old River opposite Rancho del Rio.

Phytoplankton biomass and resulting chlorophyll *a* concentrations in some areas of the estuary may be influenced by extensive filtration of the water column by the introduced Asian clam, *Potamocorbula amurensis*. Well-established benthic populations of *P. amurensis* in Suisun and San Pablo bays are thought to have contributed to the low chlorophyll *a* concentrations (and increased water clarity) measured in these westerly bays since the mid-1980s.

In addition to monitoring for chlorophyll *a*, water samples were analyzed for pheophytin *a*.

Pheophytin *a* is a primary degradation product of chlorophyll *a*, and its relative concentration is useful for estimating the general physiological state of phytoplankton populations. When phytoplankton are actively growing, the concentrations of pheophytin *a* are normally expected to be low in relation to chlorophyll *a*. The mean pheophytin *a* concentration for all samples

in 2012 was  $1.92 \mu\text{g/L}$ , and the median value was  $1.05 \mu\text{g/L}$ . The maximum pheophytin *a* concentration was  $26.20 \mu\text{g/L}$ , recorded on the San Joaquin River at Vernalis in July. The minimum pheophytin *a* concentration was  $0.08 \mu\text{g/L}$ , recorded in Suisun Bay at Bulls Head Point near Martinez in October.

Centric diatoms, cyanobacteria, pennate diatoms, cryptomonad flagellates, green algae, and euglenoid flagellates constituted 99.9 percent of the organisms collected in 2012.

All organisms collected in 2012 fell into these 12 categories (in order of abundance):

- (1) centric diatoms (class Coscinodiscophyceae);
- (2) cyanobacteria (class Cyanophyceae);
- (3) pennate diatoms (classes Bacillariophyceae and Fragilariophyceae);
- (4) cryptomonad flagellates (class Cryptophyceae);
- (5) green algae (classes Chlorophyceae, Ulvophyceae, and Zygnematophyceae);
- (6) euglenoid flagellates (class Euglenophyceae);
- (7) ciliates (classes Kinetofragminophora and Spirotrichea);
- (8) dinoflagellates (class Dinophyceae);
- (9) chrysophyte flagellates (class Chrysophyceae);
- (10) xanthophyte flagellates (class Xanthophyceae);
- (11) silicoflagellates (class Dictyochophyceae); and
- (12) synurophyte flagellates (class Synurophyceae).

The 10 most common genera collected in 2012 were:

- (1) *Cyclotella* (centric diatom);
- (2) *Aulacoseira* (centric diatom);
- (3) *Aphanizomenon* (cyanobacterium);

- (4) *Chroococcus* (cyanobacterium);
- (5) *Fragilaria* (pennate diatom);
- (6) *Navicula* (pennate diatom);
- (7) *Anabaena* (cyanobacterium);
- (8) *Melosira* (centric diatom);
- (9) *Leptolyngbya* (cyanobacterium); and
- (10) *Euglena* (euglenoid flagellate).

As in 2011, a fall bloom occurred in 2012, though it didn't last as long as the 2011 bloom, and it was seen at just three stations. The bloom was first detected on October 4 in the San Joaquin River at Potato Point. It was also seen at Frank's Tract near Russo's Landing on October 5, and was last detected in the Sacramento River above Point Sacramento on October 8. The bloom consisted entirely of a centric diatom, *Aulacoseira* sp. Fall blooms such as this one have not been seen since the early 1980s.

In May 2012, a bloom of the pennate diatom *Entomoneis* sp. occurred in Suisun Bay off Middle Point near Nichols. This bloom was the lone chlorophyll *a* value above 10 µg/L that was not recorded in the San Joaquin River at Vernalis (19.4 µg/L). A similar bloom of this diatom occurred at this same location, and elsewhere in Suisun Bay, in 2010.

## Activities Outside the Delta

Routine SWP water quality monitoring activities, as well as special studies, are conducted outside the Delta. The special studies are in response to increasingly stringent regulations facing water purveyors who rely on DWR to deliver high-quality raw water. Most of these special studies were initiated because of fish and wildlife and water quality concerns held by agencies that provide domestic water service.

## Water Quality Monitoring in the SWP

DWR's Division of Operations and Maintenance monitors water quality

throughout the SWP. This monitoring program has more than 40 sampling stations and analyzes more than 200 different chemical, biological, and physical constituents. DWR has installed monitoring stations at SWP storage and conveyance facilities located throughout the State, ranging from the Feather River watershed in the north to Lake Perris in the south. Conveyance facilities include the Oroville Facilities, California Aqueduct with the East and West Branches, North Bay Aqueduct, South Bay Aqueduct, and the San Luis Joint-Use Complex. DWR collects and analyzes samples monthly at most stations, although DWR can vary the frequency from weekly to annually depending on location, time of year, or special events. DWR sends the water samples to its Bryte Chemical Laboratory in West Sacramento for processing and analysis. Constituents analyzed include dissolved solids; nutrients; minerals such as chloride, sulfate, and sodium; trace metals; herbicides; pesticides; and organic substances.

DWR's water quality monitoring program also uses a network of 16 automated monitoring stations at key locations along the SWP. This network provides real-time data by continuously monitoring a variety of physicochemical parameters such as specific conductance, turbidity, pH, UV<sub>254</sub> (254 nanometer ultraviolet absorbance; measures dissolved organic carbon), and fluorometry. SWP contractors rely on this essential data to assure the quality of water delivered by the SWP.

The water quality monitoring program is an important operational component of the SWP. DWR uses the data to assess water quality changes in the SWP, short- and long-term trends, and impacts from emergencies such as spills and pipe ruptures. DWR also uses the data to influence operations and to determine the quality of drinking water as defined by the CDPH. The findings are disseminated through a variety of media



including memos, network postings, conference calls, and email distribution. DWR periodically conducts special studies to investigate the impacts of specific incidents affecting SWP water quality. The special studies include groundwater turn-ins, floodwater inflows, hydrology, and Delta hydrodynamics. The Division of Operations and Maintenance posts a number of water quality reports on DWR's website.

During 2012, water quality was assessed monthly at eight SWP facilities and at the CVP's Delta-Mendota Canal (see Table 4-1). Specific conductance (EC) averaged 84 microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ) at Thermalito Afterbay; 326  $\mu\text{S}/\text{cm}$  at North Bay Aqueduct, Barker Slough Pumping Plant; 612  $\mu\text{S}/\text{cm}$  at the Delta-Mendota Canal; and 457 to 491  $\mu\text{S}/\text{cm}$  in the California Aqueduct. Dissolved organic carbon was highest at the North Bay Aqueduct (7.0 mg/L), while concentrations in the California Aqueduct ranged from 2.7 to 4.0 mg/L. The North Bay Aqueduct exhibited higher levels of turbidity (25 NTU [nephelometric turbidity units]) compared to other locations. Mean arsenic concentrations were 0.002 mg/L at all locations, except Thermalito Afterbay which had no detectable arsenic concentrations. Bromide ranged from <0.01 mg/L at Thermalito Afterbay to 0.28 mg/L at the Delta-Mendota Canal. Water quality in the Oroville Facilities was very good with nondetectable to low levels of minerals, nutrients, and most minor elements. Alkalinity, specific conductance, and total dissolved solid concentrations were 40 mg/L, 84  $\mu\text{S}/\text{cm}$ , and 54 mg/L, respectively.

In 2012, DWR sampled for pesticides, herbicides, and other organic compounds in March, June, and September (see Table 4-2). Low concentrations of the pesticide diuron were found at all locations except Check 29. Metolachlor was detected at the North Bay Aqueduct, Delta-Mendota Canal, and Banks Pumping Plant. The chemical

2,4-dichlorophenoxyacetic acid (2,4-D) was detected at the North Bay Aqueduct, Delta-Mendota Canal, Banks Pumping Plant, and Check 13. Other detected pesticides included: simazine, atrazine, MCPP (methylchlorophenoxypropionic acid), and triclopyr. Of the seven detected herbicides, diuron had the highest concentration (1.7  $\mu\text{g}/\text{L}$ ), followed by 2,4-D (1.4  $\mu\text{g}/\text{L}$ ), metolachlor (0.7  $\mu\text{g}/\text{L}$ ), MCPP (0.2  $\mu\text{g}/\text{L}$ ), triclopyr (0.2  $\mu\text{g}/\text{L}$ ), simazine (0.04  $\mu\text{g}/\text{L}$ ), and atrazine (0.03  $\mu\text{g}/\text{L}$ ). The concentrations of the detected herbicides ranged from 0.02 to 1.7  $\mu\text{g}/\text{L}$ .

## Groundwater Turn-ins

Groundwater turn-ins to the California Aqueduct are authorized during periods of drought or reduced SWP allocations. SWP contractors or other participants of an approved program convey groundwater into the aqueduct. This water may be used for local redistribution or transfer to other water contractors. Groundwater turn-ins are allowed provided they do not result in the degradation of SWP water quality, cause toxicity to fish and wildlife, or adversely affect beneficial uses.

In 2001, DWR established interim criteria with an update in 2012 to review the water quality of the groundwater turn-ins using a two-tiered approach. Tier 1 programs have a "no adverse impact" criterion and are tied to historical water quality levels in California. Programs meeting Tier 1 criteria are generally approved by DWR without referral to the State Water Contractor Facilitation Group. Tier 2 programs involve water quality levels that exceed the historical water quality in the California Aqueduct and have the potential to cause adverse impacts to the SWP water contractors. Tier 2 programs are referred to the State Water Contractor Facilitation Group for review and recommendations to DWR. DWR considers all factors before making a decision on a proposed water turn-in program.

**Table 4-1 Mean Water Quality at Selected SWP Grab Sample Locations<sup>a</sup> in 2012**

Constituent	Units <sup>b</sup>	Reporting Limit	California Aqueduct								
			Thermalito Afterbay at Outlet	North Bay Aqueduct, Barker Slough Pumping Plant	Delta-Mendota Canal Upstream of McCabe Road	Banks Pumping Plant	O'Neill Forebay Outlet (Check 13)	Kettleman City (Check 21)	Near Highway 119 (Check 29)	Tehachapi Afterbay (Check 41)	Devil Canyon 2nd Afterbay
Alkalinity	mg/L as CaCO <sub>3</sub>	1	40	100	87	70	74	72	72	72	72
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NR	NR
Arsenic	mg/L	0.001	<0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.1	<0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Bromide	mg/L	0.01	<0.01	0.04	0.28	0.25	0.26	0.26	0.24	0.25	0.23
Calcium	mg/L	1	8	16	26	19	20	20	21	20	20
Chloride	mg/L	1	<1	23	91	78	80	83	74	77	72
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	0.001	<0.001	0.002	0.001	0.001	0.001	0.001	<0.001	0.001	0.001
Hardness	mg/L as CaCO <sub>3</sub>	1	36	99	131	99	106	102	100	100	94
Iron	mg/L	0.005	0.006	0.051	0.013	0.018	0.013	0.007	0.005	<0.005	<0.005
Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium	mg/L	1	4	14	16	13	14	13	12	12	11
Manganese	mg/L	0.005	<0.005	0.026	0.005	0.011	0.006	<0.005	<0.005	<0.005	<0.005
Nitrite + Nitrate	mg/L as N	0.01	<0.01	0.15	0.93	0.48	0.55	0.50	0.54	0.49	0.39
Organic Carbon, Dissolved	mg/L as C	0.5	NR	7.0	3.9	4.0	3.4	3.9	3.0	3.1	2.7
Organic Carbon, Total	mg/L as C	0.5	NR	7.8	4.0	4.1	3.6	3.5	3.5	3.2	3.0
Phosphate-Ortho	mg/L as P	0.01	<0.01	0.13	0.11	0.06	0.06	0.06	0.06	0.08	0.05
Phosphorus-Total	mg/L	0.01	<0.01	0.25	0.15	0.09	0.09	0.09	0.08	0.15	0.07
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium	mg/L	1	3	29	69	54	57	57	54	54	52
Specific Conductance	µS/cm	1	84	326	612	469	483	491	477	475	457
Sulfate	mg/L	1	2	25	62	34	35	35	37	34	33
Total Dissolved Solids	mg/L	1	54	189	344	264	269	273	265	268	254
Turbidity	NTU	1	2	25	8	6	4	4	3	4	<1
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005

<sup>a</sup> A grab sample is a single sample chosen to represent the conditions in a given matrix (usually natural water) at a specific location, depth, and time. All reported constituents are the annual mean of laboratory analytical values sampled monthly from January through December. The annual mean may be based upon one to twelve samples for the list of constituents. When one or more analytical results for a constituent are non-detect, the mean is calculated using "0" for the non-detect results, which accounts for some mean values that are less than the reporting limit.

<sup>b</sup> mg/L = milligrams per liter; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity unit; NR = No data recorded at this location.

**Table 4-2 Pesticides, Herbicides, and Other Organic Substances Detected in the SWP in 2012**

Sampling Location <sup>a</sup>	Sampling Station ID Number	Sample Date	Chemical Detected <sup>b</sup>	Concentration (µg/L) <sup>c</sup>	
North Bay Aqueduct, Barker Slough Pumping Plant	KG000000	3/21/12	2,4-D	1.4	
			Diuron	0.35	
			MCPP	0.2	
			Triclopyr	0.2	
Delta-Mendota Canal upstream of McCabe Road	DMC06716	6/20/12	Metolachlor	0.7	
		3/20/12	Diuron	0.35	
			6/19/12	Atrazine	0.02
			Metolachlor	0.1	
California Aqueduct at Banks Pumping Plant	KA000331	9/18/12	2,4-D	0.2	
		3/21/12	Diuron	0.27	
			6/20/12	Atrazine	0.03
			Metolachlor	0.1	
California Aqueduct at O'Neill Forebay Outlet (Check 13)	KA007089	9/19/12	2,4-D	0.1	
		3/20/12	Diuron	0.38	
			6/19/12	Simazine	0.02
			9/18/12	2,4-D	0.2
California Aqueduct near Kettleman City (Check 21)	KA017226	3/20/12	Simazine	0.04	
		6/19/12	Simazine	0.02	
California Aqueduct near Highway 119 (Check 29)	KA024454	3/21/12	Diuron	1.7	
California Aqueduct at Tehachapi Afterbay (Check 41)	KA030341	3/21/12	Diuron	1.2	
		6/20/12	Simazine	0.02	
California Aqueduct at Devil Canyon 2nd Afterbay	KA041323	3/21/12	Diuron	0.39	
		6/20/12	Simazine	0.02	

<sup>a</sup> Water at these locations is normally sampled during March, June, and September.

<sup>b</sup> Only chemicals found in detectable amounts at the sampling stations are included in this table. Refer to the document entitled *Analytical Methods for Organic Chemicals* for a complete listing of all organic chemicals included in the laboratory analysis. The document is available online on DWR's website.

<sup>c</sup> µg/L = micrograms per liter.

During 2012, approximately 135,149 acre-feet of groundwater was pumped into the California Aqueduct from Tier 2 sources in the south San Joaquin Valley (San Joaquin Field Division). Table 4-3 shows the agencies that provided the groundwater and the amount pumped into the aqueduct.

Changes in water quality in the California Aqueduct were assessed with upstream sampling at Check 27 and Check 29. Water samples were analyzed for constituents of concern including arsenic, bromide, conductivity, dissolved organic carbon, nitrate, sulfate, and total dissolved solids. None of the constituents of concern in the

**Table 4-3 Groundwater Pumped into the California Aqueduct in 2012**

Groundwater Source	Amount (acre-feet)
Kern Water Bank Authority, Kern Water Bank Canal	109,432
Cross Valley Canal	12,971
Arvin-Edison Water Storage District	10,010
Wheeler Ridge-Maricopa Water Storage District	1,312
Westlands Water District	1,313
San Luis Water District	111
<b>Total</b>	<b>135,149</b>

turn-in groundwater from these sources exceeded existing drinking water maximum contaminant levels in the aqueduct.

Pumping from San Luis Water District (San Luis Field Division) was discontinued when the water exceeded turn-in agreement standards for conductivity, chloride, and sodium.

Additional SWP water quality data are available electronically from DWR’s website.

### San Joaquin Valley Agricultural Water Quality Programs

There are a number of programs that conduct or support monitoring, research, training, or demonstration projects related to San Joaquin Valley agricultural water quality. For information about these programs, see Chapter 5, Local Assistance.

### Municipal Water Quality Program Branch

The Sacramento-San Joaquin Delta provides drinking water for more than 25 million people in California. The Division of Environmental Services, Municipal Water Quality Program (MWQP) is responsible for evaluating the suitability of Delta water as a drinking water source, identifying sources of water quality degradation, and ensuring water quality data meet quality assurance

and quality control objectives. The MWQP Branch includes the Municipal Water Quality Investigations (MWQI) Program (MWQI Section, Field Support Section, Water Quality Special Studies Section, Real Time Data and Forecasting Comprehensive Program [RTDF-CP]) and the Quality Assurance/Quality Control (QA/QC) Section.

The mission of the MWQI Program is to:

- support the effective and efficient use of the SWP as a source water supply used for municipal purposes through monitoring, forecasting, and reporting SWP water quality;
- provide early warning of changing conditions in source water quality used for municipal purposes;
- provide data and knowledge-based support for operational decision-making on the SWP;
- conduct scientific studies of importance to drinking water; and
- provide scientific support to DWR, the State Water Project Contractors Authority-MWQI Specific Project Committee, and other governmental entities.

### Real Time Data and Forecasting Comprehensive Program

The RTDF-CP has become a central element of the MWQP. The goal of the program is to further develop the capability for real-time data and forecasting of short- and long-term source drinking water quality conditions in the Delta and SWP. Within the MWQP, the RTDF-CP entails the following elements:

- real-time monitoring conducted at key locations, providing stakeholders and interested parties with timely data;
- field operations that ensure proper operation of all automated sampling equipment;

- consistent modeling with continuous updates providing the best forecasts possible;
- QA/QC of the instruments and data; and
- centralized information management and dissemination.

The real-time monitoring network now includes stations located at Banks Pumping Plant, Jones Pumping Plant, the Sacramento River at Hood, and the San Joaquin River near Vernalis (McCune Station). MWQP is constructing a fifth station at the Gianelli Pumping-Generating Plant at San Luis Reservoir.

The RTDF-CP worked with several other agencies to develop a Delta spill early-warning model and alert system. This enables Delta water users to receive early warning of spills or sewage overflows, estimating concentration and arrival time.

## Quality Assurance/Quality Control

The QA/QC Program was established by Water Resources Engineering Memorandum No. 60 in 1992 to ensure that data generated by DWR's environmental monitoring programs meet high quality standards and are scientifically defensible. This is accomplished by encouraging monitoring programs to follow standardized procedures including quality control measurements in their sampling protocols.

The program performs the following functions:

- procures specialized products and services from outside sources on an as-needed basis, which may include obtaining certified laboratory standards and outside instructors for teaching technical classes;
- publishes QA/QC guidance documents;
- develops and maintains the drinking water quality database and associated

quality control metadata as part of the DWR Water Data Library; and

- assists departmental programs with developing quality assurance project plans.

The QA/QC Program, with assistance from California State University, Sacramento, and the University of California (UC Davis Extension), organized and presented three classes that were open to all DWR staff. The first was "Quality Assurance for Water Quality Monitoring" on May 16 and 17, 2012. The class was aimed at managers and technicians involved in planning and conducting field water quality monitoring activities. The class provided tools and resources to integrate QA/QC procedures into a project's planning and data collection processes as required under Water Resources Engineering Memorandum No. 60. The second class was "Applied Environmental Statistics" on October 1-5, 2012. The class was aimed at scientists and engineers who plan, collect, and interpret environmental data and report their findings to management and other interested parties. The class provided up-to-date intermediate and advanced statistical procedures for analyzing environmental data. The third class was "Introduction to Environmental Statistics" on December 14, 17, and 18, 2012. This class was aimed at engineers, scientists, and technicians who needed a refresher course on statistics.

QA/QC staff continued improving the Field and Laboratory Information System, a database used by field personnel to generate field sheets and by Bryte Chemical Laboratory to manage and store laboratory quality control data. QA/QC Program staff designed a module that project managers can use to download laboratory quality control batch data for their projects instead of manually requesting these data from the lab. This will enable project managers to validate their projects' data in a timely manner.



## Water Quality Special Studies

Special studies are conducted to investigate the origins, fate, transport, and in some cases loads of current and emerging contaminants of concern. Such studies help determine where new instruments should be located. Special studies can also be used to:

- investigate seasonal patterns and trends of constituents or examine circulation patterns of contaminants;
- refine modeling assumptions; and
- assess the impacts of increasing urbanization on levels of water quality constituents of concern.

MWQI engages in special studies that focus on specific aspects of source waters, contaminant loading, measurement methods and instrumentation, and climate and hydrology. The following studies were in progress during the 2012 calendar year:

- Urban Sources and Loads Investigation of Lathrop, California;
- investigation of O'Neill Forebay water circulation;
- spectrofluorometer study;
- feasibility study for a portable water quality monitoring station;
- in-situ fluorometer measurements of dissolved organic matter; and
- MWQI Program Summary Report.

## Accomplishments for the 2011–2012 MWQI Work Plan

During the 2011–2012 work plan cycle, the MWQI accomplished the following goals:

- completed installing a water quality station at the Gianelli Pumping-Generating Plant, which will provide data on-line to the California Data Exchange Center and daily MWQP RTDF-CP water quality reports;
- updated MWQP's 5-year strategic plan;

- completed short-term Sacramento WARMF (Watershed Analysis Risk Management Framework) monitoring;
- completed of trihalomethane and formation potential comparison study monitoring;
- installed a Metrohm anion analyzer at the Gianelli water quality station;
- installed new replacement water quality monitoring equipment at the continuous real-time water quality monitoring stations;
- commenced calibration and reporting limit studies on the new replacement water quality monitoring equipment;
- completed a draft MWQP summary report on the history of the program and important study results;
- initialized version 2 of the Field Station Real Time Monitoring Standard Operating Procedures;
- completed the investigation of longitudinal dispersion rate and travel time of constituents in the SWP; and
- produced several projects to develop data for historical conditions for the Delta and Aqueduct models (Delta Simulation Model 2 [DSM2] and DSM2 Aqueduct Extension Model of the SWP), as well as for the WARMF model development. This includes assembling, synthesizing, and refining EC, dissolved organic carbon, and bromide data necessary to define boundary conditions. These projects were part of a large RTDF-CP water quality forecast project involving the Bay-Delta Office and SWP Operations Control Office.

The special study reports and other MWQP publications can be found on DWR's website.

## Bryte Chemical Laboratory

Established in 1951, Bryte Chemical Laboratory is DWR's primary analytical laboratory. Its main function is to analyze drinking water, surface water, wastewater, and groundwater for the various water

quality programs within DWR. Since 1990, the laboratory has been certified biannually by the CDPH Environmental Laboratory Accreditation Program to perform water quality analyses following U.S. Environmental Protection Agency or American Water Works Association procedures and analytical methods. This certification allows the laboratory to perform analyses for regulatory work that can be used for compliance purposes. The laboratory continues to perform the majority of chemical and other related analyses required to support DWR's water quality programs. Each year, thousands of water samples are routinely analyzed for inorganic and organic constituents such as standard minerals, cations, anions, nutrients, metals, chlorophyll, pesticides, herbicides, and volatile organic compounds.

In 2012, the laboratory upgraded its capability and capacity to detect and analyze organic carbon following U.S. Environmental Protection Agency Method 415.3 with the purchase of a Xylem OI Analytical Aurora 1030W total organic carbon analyzer. It is a fully automated and computer-controlled instrument equipped with an 88-position autosampler and a nondispersive infrared detector that generates data that are highly stable, accurate, and reproducible. The instrument's detection limit has been established at 0.5 part per million.

The laboratory has continued to manage a variety of analytical contracts with other State agencies and several outside laboratories in accordance with the master contract policy approved in fiscal year 1994–1995. These contracts are used to perform analyses that are beyond the capability and capacity of the laboratory, such as solids and fish tissues. The laboratory works in conjunction with DWR's MWQP QA/QC Section to replace these contracts as they expire each fiscal year. On July 1, 2012, The Metropolitan Water District of Southern California was awarded the contract for

water taste and odor analysis worth \$35,000 for one year.

SWP security and protection has continued to be a primary goal for DWR since September 11, 2001. To help protect the SWP from biochemical and chemical agents, the Bryte Chemical Laboratory continues to be an active member in a group of laboratories called the California Association of Mutual Aid Laboratories Network (CAMAL Net) headed by CDPH. The laboratory network's main objective is to voluntarily assist CDPH in the analysis of chemical agents in water quality samples should a natural disaster or biochemical or chemical event occur in California. The assistance is only required should the analytical capacity of CDPH be exceeded or to confirm the presence or absence of chemical agents in water quality samples provided by CDPH. In 2007, Bryte Chemical Laboratory was classified as a Level II participating laboratory in the CAMAL Net organization. Level II only allows the laboratory to receive samples that are prescreened and determined nonhazardous to laboratory personnel.

## Suisun Marsh Program Activities

Suisun Marsh consists of approximately 59,000 acres of tidal and managed brackish water wetlands and 30,000 acres of bays and sloughs. It is the largest contiguous brackish marsh remaining in the United States. Situated in southern Solano County, west of the Sacramento-San Joaquin Delta and north of Suisun Bay, the marsh encompasses more than 10 percent of California's remaining natural wetlands. The marsh is the resting and feeding ground for thousands of waterfowl and shorebirds migrating on the Pacific Flyway. It provides important habitat for more than 221 bird species, 45 mammal species, 16 reptile and amphibian species, and more than 40 fish species.

DWR became intricately involved in the Suisun Marsh in response to SWRCB Water Right Decision 1485, which required mitigation for effects of the SWP and CVP. The 1984 *Plan of Protection for Suisun Marsh*, completed by DWR, included construction of a series of facilities to distribute lower salinity water to managed wetlands and monitoring in relation to these facilities. Today, DWR operates and maintains these water management facilities, including the Roaring River Slough Distribution System (RRSDS), Morrow Island Distribution System (MIDS), Goodyear Slough Outfall,

and the Suisun Marsh Salinity Control Gates (SMSCG). Figure 4-2 shows the water quality compliance and monitoring sampling locations and the water management facilities.

Through agreements and plans, DWR has been working in coordination with Reclamation, DFW, Suisun Resource Conservation District (SRCD), USFWS, and other agencies on habitat management, preservation, and restoration of the Suisun Marsh.



**Figure 4-2 Compliance and Monitoring Stations and Water Management Facilities in the Suisun Marsh**



## Revised Suisun Marsh Preservation Agreement

In 1987, DWR, Reclamation, DFW, and SRCD signed the *Suisun Marsh Preservation Agreement* (SMPA). It required Reclamation and DWR to meet salinity standards as specified in the then-current SWRCB Water Right Decision 1485, set a timeline for implementing the *Plan of Protection for the Suisun Marsh*, and delineated monitoring and mitigation requirements. A revised SMPA and *Revised Mitigation and Monitoring Agreement* were signed in 2005 to make channel water salinity requirements consistent with D-1641. These included management activities in lieu of western marsh facilities proposed in the plan of protection.

The revised SMPA included the following actions: operate facilities in order to meet channel water salinity standards consistent with D-1641; implement a Water Manager Program; provide portable pumps; update Individual Ownership Adaptive Management Habitat Plans; establish a Drought Response Fund; and replace turnouts on the RRSDS. The monitoring agreement included monitoring for fish, the Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*), the Ridgway's Rail (*Rallus obsoletus*), vegetation, and other biological monitoring.

During 2012, DWR, DFW, Reclamation, and SRCD continued to implement these activities. Also in 2012, negotiations began for updating the revised SMPA to include remaining mitigation obligations.

## Facility Operations, Maintenance, and Related Activities

### *Morrow Island Distribution System*

MIDS is an interior ditch bordered by levees that was created to distribute water to managed wetlands. Water with relatively lower salinity is taken from Goodyear Slough in the west through water control structures

that transport the water into MIDS. Water is then distributed to managed wetlands through private landowner water control structures along the ditch. Water not used by the landowners exits into Grizzly Bay through water control structures in the east.

**Fish Screen and Alternatives.** Based on previous study results, a fish screen at MIDS would likely have negligible benefits to sensitive fish populations (see Bulletin 132-07, Chapter 4, Water Quality). DWR and Reclamation are proposing to fulfill the outstanding terms and conditions of the USFWS 1997 BO for the MIDS maintenance project by acquiring and protecting, in perpetuity, aquatic habitat in Suisun Marsh. (For additional information about the BO, see Bulletin 132-08.) The status of this proposal remains on-going without new notable developments or changes.

**Longfin Smelt Incidental Take Permit.** On February 23, 2009, DFW issued an incidental take permit for the on-going and long-term operation of existing SWP facilities in the Sacramento-San Joaquin Delta for the protection of Longfin Smelt. MIDS is included as one of these facilities.

To minimize the take of Longfin Smelt at the MIDS diversion, DFW specifies the average intake velocities each year to adequately protect these fish.

Also, as a requirement of the incidental take permit, DWR is developing a study to confirm that the aforementioned operation prevents or substantially reduces the entrainment of Longfin Smelt at MIDS.

In July 2012, an inspection of Morrow Island Bridge over Goodyear Slough found the bridge was severely deteriorated. As a result, access and maintenance of MIDS was suspended.

### **Suisun Marsh Salinity Control Gates**

The SMSCG are operated as needed to meet salinity standards. When they are not in operation, they are placed in an open position to minimize fish concerns related to predation and impedance. Installation or removal of the flashboards and operation of the gates vary depending on salinity conditions, fisheries agencies' requests for sensitive species concerns, or repairs.

**Status of SMSCG in 2011–2012.** The control season (October 2011 through May 2012) began with the installation of the flashboards on October 21, 2011. The SMSCG were tidally operated between January 4 and February 13, 2012, due to salinity concerns in the marsh. The boat lock remained open during the control season to allow for fish passage. On start-up on January 4, all three gates started operating remotely. After operating for 41 days, salinity decreased and gate operations were suspended on February 14, 2012. Salinity levels increased in February after gate operations were suspended and decreased in March due to higher outflow from precipitation. Salinity levels remained below the monthly standards during April and May. The flashboards were removed on May 1, 2012.

### **Other Facility Operation and Maintenance**

The RRSDS and Goodyear Slough Outfall were operated and maintained as needed to provide lower salinity water to managed wetland properties. In the summer of 2012, the RRSDS levee system was brought up to the minimum design elevation of 6.7 feet. Eighteen miles of levee was raised using 3,000 cubic yards of fill and 3,000 tons of aggregate base rock.

### **Water Quality and Compliance**

Salinity levels for the 2011–2012 control season were below monthly standards for all five compliance stations.

Details of salinity levels in the marsh are available in the monthly report entitled *Suisun Marsh Monitoring Program Channel Water Salinity Report* available on DWR's website.

### **Blacklock Restoration Project**

DWR received CALFED Ecosystem Restoration Program grant funds in 2001 to acquire the 70-acre Blacklock property in December 2003. DWR, in cooperation with Reclamation, DFW, USFWS, and SRCD, implemented the Blacklock Restoration Project (location shown on Figure 4-2). This project restored diked, managed wetlands to tidal wetlands. Although a natural breach in the levee occurred in July 2006, it was determined that the planned breach should still be constructed to allow for full tidal flow and optimum sediment transportation. The planned breach construction occurred on October 3 and 4, 2006.

The project goals and objectives are to:

- restore the area to a fully functioning, self-sustaining marsh ecosystem created through restoration of natural hydrologic, sedimentation, and biological processes;
- increase the area and contiguity of emergent wetlands providing habitat for tidal marsh species; and
- assist in the recovery of at-risk species.

The final restoration plan for the project was published in June 2007.

In 2012, DWR continued implementing the 10-year monitoring program at the Blacklock site. Monitoring is performed in cooperation with State and federal agencies. There are 15 parameters being monitored, including sediment accretion, channel network evolution, vegetation development, water quality, methylmercury concentrations, and avian use.



In 2012, DWR worked on obtaining and correcting data collected in coordination with DFW and Wetlands and Water Resources, Inc. This data and instructions were sent to Wetlands and Water Resources, Inc. to start analysis and write a monitoring report. The report is expected to be available in 2014.

For more information about the Blacklock Restoration Project, visit the Suisun Marsh Program webpage on DWR's website.

### **Suisun Marsh Habitat Management, Preservation, and Restoration Plan**

The *Suisun Marsh Habitat Management, Preservation, and Restoration Plan*, referred to as the Suisun Marsh Plan, was developed by the Principal Agencies (or Principals), a group of agencies with primary responsibility for Suisun Marsh management. The Suisun Marsh Plan is intended to balance the benefits of tidal wetland restoration with other habitat uses in the marsh by evaluating alternatives that provide a politically acceptable change in marshwide land uses, such as salt marsh harvest mouse habitat, managed wetlands public use, and upland habitat. It relies on the incorporation of existing science and information developed through adaptive management.

The Principals include USFWS, Reclamation, DFW, DWR, the National Marine Fisheries Service, and SRCD. The Principals have consulted with other participating agencies, such as the U.S. Army Corps of Engineers, the San Francisco Bay Conservation and Development Commission, the RWQCBs, and SWRCB to develop this plan.

During 2011, the Suisun Marsh Plan was completed. Reclamation and USFWS served as joint National Environmental Policy Act lead agencies, and DFW served as the California Environmental Quality Act lead agency. In 2012, the Principals continued

to work to obtain regulatory permits and related environmental clearances.

### **Suisun Marsh Expenditure History**

Suisun Marsh expenditures and reimbursements administered by DWR for calendar years 1968 through 2012 are summarized in Table 4-4. From 1968 through December 31, 2012, DWR disbursed more than \$145 million of SWP funds for planning, design, environmental documentation, construction, maintenance, monitoring, mitigation, and permit compliance in support of implementing the *Plan of Protection for the Suisun Marsh* through the SMPA and for meeting standards set by SWRCB. Reclamation has reimbursed DWR approximately \$52.8 million (36 percent), and the State's General Fund has reimbursed approximately \$9.5 million (6.5 percent). These figures do not include up-front payments made by Reclamation for staff and other direct costs, as well as approximately \$5.7 million in Reclamation interest payments during 1988 and 1989.

Annual figures are reported in Table 4-4 for DWR's up-front payments, Reclamation reimbursements, General Fund reimbursements, and DWR's cumulative expenditure balance.

**Table 4-4 Suisun Marsh Expenditures and Reimbursements Administered by DWR (in dollars), 1968–2012**

Year [1]	Reach 305 Costs [2]	General Fund Payment [3]	Adjustment for General Fund Payment <sup>a</sup> [4]	Reclamation Invoice Payment [5]	Interest Payment Credited Back to Contractors [6]	Net SWP Costs [2] through [6] [7]	Recreation Costs <sup>c</sup> [8]	SWP Water Contractors' Costs [7] minus [8] [9]
1968	10,571					10,571	359	10,212
1969	34,181					34,181	1,162	33,019
1970	23,343					23,343	794	22,549
1971	1,042					1,042	35	1,007
1972	47					47	2	45
1973	0					0	0	0
1974	0					0	0	0
1975	2,709					2,709	92	2,617
1976	32,960					32,960	1,121	31,839
1977	37,475					37,475	1,274	36,201
1978	350,831					350,831	11,928	338,903
1979	3,660,099					3,660,099	124,618	3,535,481
1980	5,005,759					5,005,759	170,772	4,834,987
1981	2,964,974					2,964,974	101,311	2,863,663
1982	2,955,705			(2,500,000)		455,705	101,111	354,594
1983	2,754,094					2,754,094	93,643	2,660,451
1984	2,418,344					2,418,344	82,388	2,335,956
1985	2,332,773					2,332,773	79,432	2,253,341
1986	6,495,322					6,495,322	220,843	6,274,479
1987	13,600,701					13,600,701	462,424	13,138,277
1988	7,456,364			(17,368,725) <sup>b</sup>	(2,039,752)	(11,952,113)	253,516	(12,205,629)
1989	2,341,960	(9,478,000)	6,634,600	(1,219,691) <sup>b</sup>	(283,857)	(2,004,988)	79,643	(2,084,631)
1990	3,030,010			(695,450)		2,334,560	101,460	2,223,100
1991	6,223,042			(2,925,429)		3,297,613	210,454	3,087,159
1992	2,737,259			(1,174,655)		1,562,604	91,951	1,470,653
1993	2,979,255			(238,130)		2,741,125	99,897	2,641,228
1994	3,192,213			(1,962,549)		1,229,664	107,281	1,122,383
1995	2,721,978			(647,138)		2,074,840	91,218	1,983,622
1996	3,391,678			(1,482,396)		1,909,282	113,244	1,796,038
1997	3,634,267			(1,520,219)		2,114,048	121,132	1,992,916
1998	5,342,834			(1,107,501)		4,235,333	177,132	4,058,201
1999	8,867,742			(2,696,200)		6,171,542	301,424	5,870,118
2000	2,857,534			(3,300,053)		(442,519)	98,145	(540,665)
2001	2,621,301			(444,009)		2,177,292	89,431	2,087,861
2002	3,752,486			(791,319)		2,961,167	124,386	2,836,780
2003	3,258,583			(2,389,979)		868,604	107,566	761,038
2004	2,874,629			(952,940)		1,921,689	94,885	1,826,804
2005	3,940,875			(1,409,296)		2,531,579	130,049	2,401,530
2006	5,790,050			(868,449)		4,921,601	193,281	4,728,320
2007	4,086,170			(939,879)		3,146,291	134,850	3,011,441
2008	3,806,561			(1,670,278)		2,136,283	125,102	2,011,181
2009	4,635,327			(1,123,705)		3,511,622	152,967	3,358,655
2010	2,796,261			(1,663,530)		1,132,731	92,276	1,040,455
2011	3,704,794			(1,748,136)		1,956,658	122,258	1,834,400
2012	6,318,641					6,318,641	208,515	6,110,126
<b>Total</b>	<b>145,042,744</b>	<b>(9,478,000)</b>	<b>6,634,600</b>	<b>(52,839,656)</b>	<b>(2,323,609)</b>	<b>87,036,079</b>	<b>4,875,375</b>	<b>82,160,704</b>

<sup>a</sup> Under Assembly Bill 1442, the General Fund paid 20 percent of the Suisun Marsh costs through June 1988, which totaled \$9,478,000. This payment included \$2,843,400, which represents 6.5 percent of the costs through June 1988 paid by the General Fund. This amount has reduced the costs billed to the SWP water contractors. The remaining \$6,634,600 received from the General Fund represents DWR's recreation project purpose share of 14 percent.

<sup>b</sup> Excludes interest payments made by Reclamation in 1988 and 1989.

<sup>c</sup> Allocation factors for capital recreation costs have changed from 14 percent to 3.4 percent, and operations and maintenance recreation costs from 14 percent to 3.3 percent.



## Chapter 5 Local Assistance

*One of the many orchards of the San Joaquin Valley.*



## Significant Events in 2012

The California Irrigation Management Information System (CIMIS) made significant improvements to data quality and availability in support of the Water Conservation Act of 2009 (Senate Bill [SB]X7 7) and the Model Water Efficient Landscape Ordinance (MWELO).

The Recycling and Water Desalination Section contributed information to various tasks specified in SBX7 7, including assessing how to determine reasonable 2020 and 2030 targets for statewide water recycling; brackish groundwater desalination and infiltration; direct use of urban stormwater runoff; and providing water recycling information for the Commercial, Industrial, and Institutional Task Force on Water Use Best Management Practices.

In October 2012, the Department of Water Resources (DWR) released the *Agricultural Water Management Plan Guidebook*. The guidebook helps agricultural water suppliers better understand the SB X7-7 requirements and assists them in developing their Agricultural Water Management Plans (AWMPs).

Through the Integrated Regional Water Management (IRWM) Grant Program, DWR awarded \$8 million in planning grant funding in 2012.

*Information in this chapter was contributed by the Division of Statewide Integrated Water Management, the Division of Environmental Services, and the Division of Integrated Regional Water Management.*

The Department of Water Resources (DWR) manages the Davis-Grunsky Act Program, water use efficiency, agricultural drainage, and Water Conservation Bond Law programs, and participates in several other programs that assist local agencies and benefit State Water Project (SWP) water contractors.

## Davis-Grunsky Act Program

The Davis-Grunsky Act, authorized in 1960 as part of the Burns-Porter Act, provides construction loans for local domestic water projects and agricultural water supply. It also provides grants for recreation and fish and wildlife enhancement. Additionally, loans and grants may be given to rehabilitate dams and reservoirs.

DWR's ongoing administration of Davis-Grunsky program loans and grants includes management and oversight of 32 recreation projects and contracts. Administration costs are recovered from revenues generated by repayment of Davis-Grunsky Act loans. Recreation grant contracts are being amended to reflect modification of DWR's fee oversight functions and actual construction of recreation facilities.

The Davis-Grunsky Act requires participating State agencies to operate and maintain the recreation projects, while DWR inspects the recreation facilities, monitors the recreation contracts, and maintains a list of the recreation projects.

## Water Use Efficiency

Activities of the Water Use and Efficiency Branch in the Division of Statewide Integrated Water Management activities include providing technical assistance to local agencies; managing water use efficiency financial assistance programs; managing the California Irrigation Management Information System (CIMIS);

reviewing, tracking, and reporting on urban and agricultural water management plans; and managing drainage and water recycling/desalination projects.

## California Irrigation Management Information System

CIMIS is a network of automated weather stations that collects weather data and transmits it to a central repository in Sacramento. After performing quality control and calculations, data are made available to the public for such diverse purposes as irrigation scheduling, resource planning, research, and modeling.

In 2012, DWR's CIMIS network collected data from 145 stations, with approximately 50 percent of the stations on the network belonging to local cooperators. The demand for CIMIS data has been increasing steadily since its establishment in 1982. In 2012, the number of registered data users had grown from 661 in 1989, to more than 45,000.

Approximately 2.3 million reports were generated from the database using the CIMIS website in 2012. Thousands of reports were also retrieved from the CIMIS File Transfer Protocol site and CIMIS web services. Users can register online, access archived data, download data files, and peruse content about the CIMIS program and other helpful metadata and information. A separate but concurrently operating database and web application is maintained for redundancy to protect the data.



CIMIS continued providing the spatially distributed reference evapotranspiration ( $ET_0$ ) data, known as Spatial CIMIS, and expanded its user base through outreach activities. Spatial CIMIS is produced by coupling remotely sensed data from the National Oceanic and Atmospheric Administration's Geostationary Operational Environmental Satellite (GOES) with point measurements from CIMIS stations to estimate  $ET_0$  data at 2-kilometer grids.

In addition to increasing the number of its stations, CIMIS made significant improvements to data quality and availability in support of the Water Conservation Act of 2009 (Senate Bill [SB]X7 7) and the Model Water Efficient Landscape Ordinance (MWELO). SBX7 7 requires all water suppliers to increase water use efficiency. It also requires, among other things, the development of agricultural water management plans and a 20 percent reduction in urban water consumption by the year 2020.

In 2012, CIMIS made significant progress working on multiple projects initiated in 2010 to upgrade its hardware and software to accommodate the anticipated increase in demand for data for implementation of SBX7 7 and MWELO. When completed, these projects are expected to deliver better-quality CIMIS data more frequently, using user-friendly features.

## Recycling and Water Desalination

The goal of the Division of Statewide Integrated Water Management's Recycling and Water Desalination Section is to improve water use efficiency by promoting increased use of nonconventional water sources—namely recycled water and desalinated brackish and ocean waters—through planning, technical, and financial assistance. As part of a balanced water portfolio, nonconventional water sources will help meet existing and future water supply

and environmental needs. The section's mission consists of increasing safe and beneficial use of recycled water, advancing energy-efficient treatment and desalination technologies, and encouraging economically and environmentally acceptable use of desalinated brackish and ocean waters.

In 2012, Recycling and Water Desalination Section activities included the following:

- contributing to various tasks specified in SBX7 7, including assessing how to determine reasonable 2020 and 2030 targets for statewide water recycling, brackish groundwater desalination, infiltration and direct use of urban stormwater runoff, and providing water recycling information for the Commercial, Industrial, and Institutional Task Force on Water Use Best Management Practices;
- continuing to develop new knowledge on water recycling and desalination activities and projects in California;
- continuing to manage grant agreements for 23 of the original 48 desalination projects awarded in the first two cycles of the Proposition 50 desalination grant program. The active projects include: 10 research and development projects, 8 demonstration and pilot projects, 2 feasibility studies, and 3 construction projects;
- commencing Round 3 of Proposition 50 desalination grant solicitation;
- continuing to provide technical knowledge on water recycling and water desalination issues, including responses to questions from policymakers, regulators, State and local agencies, and the public on permitting issues; public health regulations; types, locations, and amounts of water reuse occurring; and desalinated water production and use; and
- making presentations about California's water recycling and desalination activities to DWR's visitors.

## Proposition 50 Water Use Efficiency Grant Program

Proposition 50 has provided approximately \$105 million for the Water Use Efficiency Grant Program since 2005. The grant program provided funds for implementation of all urban best management practices and agricultural efficient water management practices (EWMPs) that would result in local, regional, and statewide benefits. The State benefits are water conservation, flow and timing, water quality, and energy, among others.

A competitive proposal solicitation package (PSP) was developed for all grant cycles, along with a comprehensive review and evaluation of the project proposals. The PSP defines project benefits, eligible projects, eligible applicants, funding caps, reporting, and other contract requirements.

On October 11, 2012, DWR released the Proposition 50 Final Agricultural Water Use Efficiency PSP. The grant program provides funding for agricultural water use efficiency implementation projects as well as research and development projects; feasibility studies, pilot or demonstration projects; or training, education, public outreach, or technical assistance programs. The program primarily funds projects that are not locally cost-effective and that provide water savings or contribute to in-stream flows that are beneficial to the Bay-Delta or the rest of the State. Consideration is also given to projects that address water quality and energy efficiency. In accordance with legislative requirements, the draft PSP was posted to the DWR website on August 14, 2012, for public comment. Two public workshops were conducted on September 17 and 21, 2012, in Fresno and Sacramento, respectively. Written public comments were accepted until September 21, 2012.

In November 2012, DWR received 54 proposals in response to the 2012 Proposition 50 Agricultural Water Use

Efficiency PSP. Approximately \$23.9 million in grant funding was requested for proposed projects totaling over \$42.9 million. DWR has approximately \$15 million available for this solicitation. The 54 applications received included 14 proposals for implementation projects and 40 applications for nonimplementation projects, of which 21 proposals were for research and development, feasibility studies, pilot projects, and demonstrations; 16 proposals were for training, education, and outreach; and 3 proposals were Agricultural Water Management Plan (AWMP) preparation.

In 2012, the Water Use Efficiency Grant Program continued managing close to 150 grant agreements from previous proposal solicitations, the last of which was the Drought Assistance Proposal Solicitation that resulted in awarding 53 grants in the summer of 2008. Several of those grant agreements were executed after the State's "Stop Work" order was lifted in 2010.

## Agricultural Water Management Plans

SBX7 7, the Water Conservation Act of 2009 required all water suppliers to increase water use efficiency. Agricultural water suppliers are responsible for preparing, implementing, and updating AWMPs, measuring the volume of water delivered to customers, adopting a pricing structure, and implementing efficient water management practices. Agricultural water suppliers who fail to meet the specified water management planning requirements will not be eligible for water grants or loans awarded or administered by the State.

DWR and the Agricultural Water Management Council established the Agricultural Stakeholder Committee (ASC) to help DWR implement provisions of SBX7 7. Through a public process, the ASC will review technical materials and documents and provide comments, data, and supporting information to DWR.

SBX7 7 established the Agricultural Water Management Planning Act (California Water Code [CWC] Section 10800, et seq.) requiring an agricultural water supplier to prepare and adopt an AWMP on or before December 31, 2012. The agricultural water supplier is then required to update its AWMP on December 31, 2015, and every 5 years thereafter.

“Agricultural water supplier” is defined as a publicly or privately owned water supplier that provides water to 10,000 or more irrigated acres, excluding acreage that receives recycled water. An agricultural water supplier is a supplier of or contractor for water that distributes or sells water for resale. Every water supplier that becomes an agricultural water supplier after December 31, 2012, and provides water to 25,000 or more irrigated acres, excluding recycled water, is responsible for preparing and adopting an AWMP within one year of becoming an agricultural water supplier. Agricultural water suppliers that provide water to less than 25,000 irrigated acres, excluding recycled water, are not required to adopt and implement an AWMP unless sufficient funding has specifically been provided for that purpose.

In October 2012, DWR released the *Agricultural Water Management Plan Guidebook*. The guidebook is meant to help increase agricultural water suppliers’ understanding of the SBX7 7 requirements and assist them in developing their AWMPs. The guidebook also provides information on how agricultural water suppliers may meet the requirements of the agricultural water measurement regulation and associated compliance documentation, as well as the aggregated farm-gate delivery reporting format. The guidebook is available online at DWR’s website.

### ***Agricultural Water Measurement Regulation***

SBX7 7 identified two critical, efficient management practices that agricultural water suppliers are required to implement: measuring the volume of water delivered to customers with sufficient accuracy to comply with CWC Section 531.10(a), and adopting a pricing structure based at least in part on quantity delivered. It also specified numerous additional efficient management practices for agricultural water suppliers to consider for implementation.

SBX7 7 requires DWR to adopt regulations that specify options for agricultural water suppliers to comply with the water measurement requirement in CWC Section 10608.48(b)(1). The regulations would apply to agricultural water suppliers providing water to 25,000 irrigated acres or more. Suppliers providing water to 10,000 or more irrigated acres, but less than 25,000 irrigated acres, are also subject to these regulations, if sufficient funding is provided for that purpose as stated in CWC Section 10853. Agricultural water suppliers that are subject to the regulations must measure the volume of water pursuant to the accuracy standards defined in the regulations and submit that data in the annual report (required by CWC Section 531.10[a]) summarizing aggregated farm-gate delivery data.

AS authorized by SBX7 7, DWR adopted an emergency agricultural water measurement regulation through the emergency rulemaking process, that was approved by the Office of Administrative Law (OAL) and became immediately effective in July 2011. DWR then began the rulemaking process for adopting a permanent agricultural water measurement regulation.

On July 11, 2012, OAL approved the permanent Agricultural Water Measurement Regulation (Title 23, Division 2, Chapter 5.1,



Sections 597–597.4 of the California Code of Regulations). The regulation was effective July 11, 2012.

Basically, the regulation allows an agricultural water supplier to choose any applicable single measurement option or combination of options in Section 597.3(a) or (b), and measurement device accuracy and operation has to be certified, tested, inspected and/or analyzed, documented, and reported as described in Section 597.4.

The annual aggregated farm-gate delivery form (required by AB 1404 (2007), CWC Section 531.10) was incorporated into this regulation by reference. All agricultural water suppliers serving more than 2,000 acres of agricultural land or providing 2,000 acre-feet of surface water annually for agricultural purposes are required, per AB 1404, to submit to DWR monthly or bimonthly aggregated farm-gate deliveries each year. Large agricultural water suppliers, serving more than 25,000 acres or greater than 10,000 acres if funding is provided and outside the 2003 Colorado River Quantification Settlement Agreement (QSA), are also subject to SBX7 7. When measuring farm-gate deliveries, suppliers subject to AB 1404 must measure using Best Professional Practices; whereas suppliers subject to SBX7 7 must use the criteria and accuracy standards in the Agricultural Water Measurement regulation.

AB 1404 broadly defines “Best Professional Practices” to mean practices attaining and maintaining accuracy of measurement and reporting devices and methods (CWC Section 531(d)). In contrast to the preceding AB 1404 general definition, the Agricultural Water Measurement Regulation specifies numerical accuracy standards for water measurement devices and requires accuracy certification, reporting, record retention, and specific protocols for device testing and inspection.

DWR conducted a series of public workshops in August and September 2012, at locations in Bakersfield, Fresno, Modesto, and Orland. These workshops primarily targeted agricultural water suppliers, consultants, and the interested public. The purpose of these workshops was to provide information on the requirements of SBX7 7, the water measurement regulation, and the aggregated farm-gate delivery report. These workshops were held with the assistance from Agricultural Water Management Council (AWMC) staff.

### ***Methodology for Quantification of Efficiency of Agricultural Water Use***

SBX7 7 directed DWR—in consultation with the AWMC, academic experts, and other stakeholders—to develop and report to the Legislature a proposed methodology for quantifying the efficiency of agricultural water use and a plan of implementation that includes estimated implementation costs, roles and responsibilities, and types of data that would be needed to support the methodology.

DWR held numerous public listening sessions, stakeholder committee and subcommittee meetings, and public workshops to develop the methodology and prepare a report to the Legislature, which was submitted in July 2012.

The proposed methodology is intended to be used as a tool to help evaluate current conditions and plan strategies for improving agricultural water management. The anticipated users of these methods are farmers, water suppliers, and regional water management groups, as well as nongovernmental organizations and local, State, federal, and tribal planners.

The DWR 2012 report to the Legislature on the proposed methodology included an implementation plan and the potential associated costs. The plan included a

three-phase schedule of implementation and identified implementing entities, roles, data needs and sources, and data management. Implementing the methodology would require new funding for DWR and water suppliers. The cost to DWR to implement the proposed methodology is approximately \$400,000 per year in addition to a one-time cost of \$500,000 for developing a database.

Estimated costs to water suppliers providing water to more than 25,000 acres of irrigated land (these suppliers account for approximately 6 million acres of irrigated land) would be about \$6 million to \$30 million per year. Estimated costs to water suppliers providing water to more than 10,000 but less than 25,000 acres of irrigated land (these suppliers account for approximately 757,000 acres of irrigated land) would be about \$8.8 million per year and a one-time cost of \$15 million for installing water measurement devices. Water measurement costs are excluded from estimates, since water delivery measurement to fields is already required by the CWC for these suppliers.

### Urban Water Management Plans

California urban water suppliers are required to adopt and submit urban water management plans to DWR every 5 years. In 2012, DWR continued to review urban water management plans submitted in 2011. Ninety-seven plans were reviewed.

#### SBX7 7

SBX7 7, the Water Conservation Act of 2009, directed DWR to be the lead agency in implementing a number of separate actions required by the law:

- consult with the: California Urban Water Conservation Council, AWMC, California Public Utilities Commission, California Department of Public Health, California Bay-Delta Authority (CBDA) or its successor agency, and the State Water

Resources Control Board (SWRCB) on various parts of the legislation;

- develop regulations for commercial, industrial, and institutional (CII) process water;
- convene a CII Task Force and develop alternative best management practices for CII;
- develop technical methodologies and criteria for urban water suppliers to set per capita baseline, target, and compliance water use;
- develop a fourth water use target method that cumulatively could result in a statewide 20 percent reduction in urban per capita water use considering certain flexibilities;
- report to the Legislature by the end of 2016 and make recommendations on needed changes if the State is not “on track” to meet per capita targets;
- promote implementation of regional water resources management practices; and
- propose new, or review and update existing, statewide targets for regional water resources management practices, including recycled water, brackish groundwater desalination and infiltration, and direct use of urban stormwater runoff.

To implement these actions through a public process, DWR convened an Urban Stakeholder Committee to provide guidance and input. DWR also began to develop the fourth target method and the industrial process water regulation.

### Assembly Bill 1420 Compliance

AB 1420 (Chapter 628, Statutes of 2007) amended the Urban Water Management Planning Act (CWC Section 10610 et seq.) and was effective January 1, 2009. AB 1420 requires that, any water management grant or loan made to an urban water supplier and awarded or administered by DWR,



SWRCB, or the CBDA be conditioned on the implementation of the water demand management measures described in the urban water management plan, as determined by DWR.

Water management grants and loans include programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This funding includes, but is not limited to, funds made available pursuant to Public Resources Code Section 75026 (the Integrated Regional Water Management Program).

AB 1420 requires DWR to consult with SWRCB and the CBDA in the development of eligibility requirements that consider the California Urban Water Conservation Council's best management practices and alternative approaches that provide equal or greater water savings. In 2009, AB 1420 compliance criteria were released.

## Agricultural Drainage Program

The Agricultural Drainage Program's mission is to seek in-valley solutions to the surface and subsurface agricultural drainage water problems, particularly in the San Joaquin Valley, and to improve water quality in the San Joaquin River. This will be accomplished by promoting newer technologies and management practices that can reduce or eliminate off-site discharge of saline water.

The San Joaquin Valley Drainage Implementation Program has been idle since 2003. However, DWR continues to implement many of its recommendations through its Agricultural Drainage Program. DWR works in partnership with California universities (the University of California and California State University), the Bureau of Reclamation (Reclamation), resource conservation districts, watershed groups,

water and drainage districts, and many other local, State, and federal entities. Program activities include:

- developing, educating, and promoting the use of Integrated On-Farm Regional Drainage Management systems in the San Joaquin Valley;
- providing technical assistance and collaborating with water and drainage districts and local entities to reduce and control surface and subsurface agricultural drainage water;
- maintaining research and demonstration projects to develop drainage reuse systems, including cost-effective, salt-tolerant crops (including energy crops); drainage treatment; disposal technologies; and salt separation and utilization;
- monitoring the quality and distribution of shallow groundwater levels in drainage-impaired areas of the San Joaquin Valley;
- promoting agricultural water and energy-use efficiency programs in drainage-impaired lands to reduce the volume of surface and subsurface drainage water and expand regional water supplies;
- maintaining programs to help improve water quality in the San Joaquin River; and
- providing grants for control of agricultural drainage water and the reduction of its toxic elements, using Propositions 50, 84, 204, and DWR project funding.

The Agricultural Drainage Program is divided into two major activities: management of Proposition 204 (the Drainage Management Subaccount) and the San Joaquin Valley Agricultural Drainage Program.

## Proposition 204 (Drainage Management Subaccount)

In 1996, Proposition 204, The Safe, Clean, Reliable Water Supply Act, authorized the transfer of approximately \$6.1 million from the SWRCB to the California Department of Food and Agriculture. In 1997, the California Department of Food and Agriculture, SWRCB, and DWR signed a memorandum of understanding that established a process for utilizing the funds designated for agricultural drainage water management activities. In 1999, the California Department of Food and Agriculture and DWR signed an interagency agreement to transfer the funds to DWR for developing and implementing programs consistent with CWC Section 78645, as outlined in the memorandum of understanding. The program's goal is to develop methods of using and concentrating salts and reducing trace element contaminants in the State's subsurface agricultural drainage water.

When bond funds are available, DWR solicits proposals from public entities seeking funding for Proposition 204 eligible activities. A technical review committee screens the proposals. DWR submits the proposal packages to an oversight committee comprised of representatives from DWR, the California Department of Food and Agriculture, and the SWRCB for final approval. Ultimately, DWR is responsible for preparing and managing contracts for the approved proposals.

## San Joaquin Valley Agricultural Drainage Program

This program consists of several activities, including drainage monitoring and evaluation, drainage treatment, integrated on-farm drainage management, drainage reduction and reuse, environmental services, and the San Joaquin River Water Quality Improvement Program.

## Drainage Monitoring and Evaluation

Drainage monitoring and evaluation provides information on the quality, quantity, and movement of drainage water. In 2012, the following activities were conducted:

- monitoring shallow groundwater levels and flows, and collecting water quality data for drainage water from west side San Joaquin Valley tile drain sumps;
- measuring groundwater levels quarterly for approximately 200 wells in Kern County;
- preparing shallow groundwater and irrigation methods maps of drainage-impaired areas using drainage monitoring data in conjunction with land use and irrigation methods data;
- providing assistance for the collection of groundwater, soil, and operational data for the integrated on-farm drainage management project at Red Rock Ranch (RRR) in western Fresno County; and
- maintaining a website that includes information on drainage programs and activities, salinity and shallow groundwater maps, Proposition 204 grants, and links related to other agricultural drainage programs.

## Drainage Treatment

**Development of Membrane Treatment of Agricultural Drainage Water.** DWR continues to fund research on the use of membrane treatment for desalting agricultural drainage water under a multiyear contract with the University of California, Los Angeles (UCLA). Two reverse osmosis desalination pilot studies have been proposed.

The first study involves cooperation with UCLA to test a nanofiltration unit coupled with a reverse osmosis unit. This unit would have proprietary sensors that allow the unit to monitor and modify online operating parameters based on changing conditions of the incoming drainage water. This trial will

determine the operating efficiency of the unit in terms of the percent of recovery compared to the amount of time it takes for membrane fouling, and determine the electrical and chemical costs of operating the unit.

Construction of this mobile treatment plant is scheduled to be completed in 2014, and initial studies will also be conducted in 2014. The first proposed site is located within the Panoche Drainage District's agricultural drainage water reuse area.

The second, a reverse osmosis research study, involves cooperation with a commercial company interested in treating water for potable use. The company intends to use a reverse osmosis unit to treat drainage water or shallow brackish groundwater. The initial goals would be similar to the UCLA reverse osmosis study, except that the commercial trial would also investigate treatment of other drainage water constituents, such as nitrate and boron.

**Grassland Area Farmers: Compliance with Water Quality Control Plan.** DWR continues to participate in a multiagency cooperative effort with Grassland Area Farmers and Reclamation to comply with the objectives of the Central Valley Regional Water Quality Control Board's *Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin*. One of the key components of the plan is drainage water treatment.

SWRCB approved the environmental impact report/environmental impact statement for the continuation of the *Grassland Bypass Project, 2010–2019*. The proposed actions are to:

- extend the San Luis Drain Use Agreement in order to allow the Grassland Basin Drainers time to acquire funds and develop feasible drain water treatment technology to meet revised Basin

Plan objectives and Waste Discharge Requirements by December 31, 2019;

- continue the separation of unusable agricultural drainage water discharged from the Grassland Drainage Area from wetland water supply conveyance channels for the period 2010–2019; and
- facilitate drainage management that maintains the viability of agriculture in the project area and promotes continuous improvement in water quality in the San Joaquin River.

### **Ion Exchange Pretreatment Investigations.**

DWR continues to successfully operate a manually controlled ion-exchange system to “soften” agricultural drainage water, as needed. The small manually operated ion-exchange treatment system provided DWR with enough information to continue utilizing this treatment process on a larger scale. In late 2011, DWR solicited bids for a larger capacity automated ion-exchange system (10 gallons per minute) that would effectively remove hardness from agricultural drainage water. Producing “soft” drainage water reduces the need for cleaning or scale removal in other treatment technologies that DWR will test in the future. The future treatment technologies will consist of electrocoagulation, vapor compression distillation, and reverse osmosis. Another benefit of ion exchange is that the regenerate will be utilized as a dust-control product in the form of calcium chloride and magnesium chloride.

The ion-exchange system was installed in 2012 at the RRR study area. However, due to decreased quantities of agricultural drainage water in 2012, the system could not operate to capacity. DWR has preliminary plans to install a groundwater well to extract shallow brackish water to supply adequate quantities of water for softening.

### **Vapor Compression Distillation Investigation.**

A vapor compression distillation unit was installed and operated on a limited basis

during 2012. During the treatment process, “softened” drainage water is evaporated, converted to steam, and then condensed, resulting in distilled water and concentrated brine. The unit is expected to achieve a flow rate of 21 gallons per minute, and the expected ratio of distilled water to brine will be 80 percent to 20 percent. DWR will continue this investigation when an adequate and consistent source of supply water can be maintained at the project site. As stated above, this will be accomplished by installing a shallow groundwater well. The preliminary investigation will determine the amount of energy required to operate the unit under differing flow ratios.

**Remote Sensing Hardware.** In March 2012, the remote sensing hardware installed on the wind turbine located at RRR began collecting and storing wind data and energy production for the 10 kilowatt wind turbine.

**Agricultural Subsurface Drainage: Salt Recovery, Purification, and Utilization.** DWR continues to support specific investigations of processes for concentrating and purifying drainage salts for marketing purposes. The current technology that DWR is investigating is the electrochemical process. This process is a carbon dioxide-negative method that produces usable agricultural chemicals such as acids, bases, and carbonates as by-products. Ongoing testing and development continued throughout 2012.

### **Integrated On-Farm Drainage Management**

DWR’s South Central Region Office’s Integrated On-Farm Drainage Management (IFDM) became a permanent activity when the Integrated Drainage Management Section was created in 2001. Its objective is to provide technical assistance on IFDM systems through advisory, technical, and oversight committees. IFDM is a drainage management system based on sequential reuse of saline drainage water to irrigate

crops of progressively increasing salt tolerance. Each sequential reuse reduces the volume of drainage water and increases the salt concentration. Drainage water too saline to irrigate crops is applied to solar evaporators, a management practice that SWRCB supports. The IFDM program funds, administers, and monitors contracts with State, federal, university, and local entities to learn more about IFDM systems. Findings indicate that IFDM systems have less significant environmental impacts than other options, and they reduce the volume of drainage water.

IFDM program staff also:

- coordinate IFDM research activities and data collection with other agencies;
- assist growers and local agencies in planning and developing IFDM systems;
- provide assistance to research projects for the development of crops, including research being performed at RRR by California State University, Fresno, to assess the suitability of various salt-tolerant forages and halophytes for the sequential reuse of drainage water, forage quality, productivity, and water use;
- assist growers, water and drainage districts, and regional entities by providing information on salt-tolerant grasses and IFDM design specifications;
- assist SWRCB to develop policies for the management of drainage water, salt, and selenium; and
- improve enhanced evaporation features of the pilot solar evaporator.

DWR is continuing research on *Prosopis alba*, an Argentine mesquite tree, in cooperation with the Forestry Research Station at Catholic University of Santiago del Estero in Argentina. *Prosopis alba*, which originated from the plantations of Catholic University of Santiago del Estero, is a highly salt-tolerant tree species that holds promise of



ameliorating subsurface drainage problems in the soils of the western San Joaquin Valley. A number of trees were planted at several drainage-impaired locations within the west side of the San Joaquin Valley. DWR has partnered with the Westside Resource Conservation District to monitor the growth and performance of the trees. A group of trees with the best salt and boron tolerance qualities were selected for final testing and were planted in a test site on the west side of the San Joaquin Valley in 2010 for monitoring. This monitoring continued throughout 2012.

DWR continues to collect operational data from IFDM projects at RRR for performance analysis.

DWR and the Center for Irrigation Technology at California State University, Fresno, are working together with the New Jerusalem Drainage District in western San Joaquin County in a study to develop an operation and management plan to manage water supplies more efficiently and reduce subsurface drainage water. The main goal is for farmers to use their water supplies efficiently and minimize percolation losses into the local underground shallow water table. A primary goal of the New Jerusalem Drainage District is to eliminate the discharge of subsurface drainage water collected from the underground water table into the San Joaquin River. A secondary goal is to meet its respective objectives without adversely impacting soil and water quality and crop productivity within the district. The combined goals result in a complex mix of irrigation and drainage management activities that need to be integrated into a single plan.

### **Central Valley Salinity Management Program**

In 2006, the Central Valley Regional Water Quality Control Board and SWRCB initiated a comprehensive effort to address salinity

problems in California's Central Valley and adopt long-term solutions that would lead to enhanced water quality and economic sustainability. The Central Valley Salinity Alternatives for Long-term Sustainability is an effort to develop and implement a comprehensive salinity management program. DWR is involved in the process by providing expertise in salinity management through participation in the committees and activities of the Central Valley Salinity Policy Group. This group provides guidance and technical support on specific issues through various committees (the Technical Advisory Committee, Social and Economic Impact Committee, and Public Education and Outreach Committee) and overall direction and management (the Executive Committee) for the development of a comprehensive Central Valley salinity management plan.

### **Drainage Reduction and Reuse Program**

DWR's Drainage Reduction and Reuse Program offers technical assistance, information, and other resources to growers and irrigators for applying irrigation water efficiently to reduce both excessive deep percolation and drainage water from the immediate on-farm source, while maintaining salt balance in the root zone.

The program objective is achieved through continued on-farm demonstration projects, studies, research, training, and workshops on scheduling irrigation management, advances in irrigation technologies, evaluating irrigation systems, reusing drainage water, and managing salinity.

**Development of Alternative Value-Added Products from Cactus (*Opuntia*) Grown as a New Fruit/Forage Crop for Selenium-Laden Waters and Drainage-Impacted Soils in the West Side of Central California.** DWR is working with the U.S. Department of Agriculture and California State University, Fresno, on a research project to provide new and realistic information for growing and producing value-added products from



*Opuntia* crops irrigated with poor-quality water and grown under nonirrigated conditions in the west side of Central California, as well as those grown in poor-quality sediment soil. An additional research objective is to determine the potential of *Opuntia* for managing naturally occurring selenium, present in drainage waters and impaired soils in the west side of the San Joaquin Valley, via accumulation and volatilization, and for producing new marketable food products. The final report was completed in July 2012 and is available online.

### **Environmental Services**

DWR's South Central Region Office's Environmental Compliance Section investigates and reports on IFDM and other systems used for disposal and management of drainage water. Environmental activities include RRR research projects that involve biological monitoring activities required in accordance with Waste Discharge Requirements permits.

### **San Joaquin River Water Quality Improvement Program**

DWR's Agricultural Drainage Program, in collaboration with other agencies, continues to make significant efforts to improve water quality in the San Joaquin River to benefit the State and SWP water contractors. These efforts are intended to control salinity and selenium discharges upstream of Vernalis. They include promoting on-farm and regional water management activities to reduce subsurface drainage, real-time water quality management to maximize the assimilative capacity of the San Joaquin River, and efforts to time wetlands discharges when there is assimilative capacity in the San Joaquin River.

Specific efforts include the West Side Regional Plan, Reclamation's San Luis Drainage Feature Reevaluation to provide drainage service to the San Luis Unit

of the Central Valley Project, and the IFDM program maintained by DWR and collaborating agencies.

### **On-farm and Regional Drainage**

**Management Activities.** Agricultural Drainage Program staff continued working with the Grassland Area Farmers to help reduce subsurface agricultural drainage water discharges into the San Joaquin River. Drainage management activities involving source control and drainage reuse have proven effective in reducing salt loads in the San Joaquin River. Since the Grassland Area Farmers implemented the Grassland Bypass Project, drainage discharges have decreased from 58,000 af to less than 14,000 af, and salt loads have been reduced from 210,000 tons to about 57,000 tons. The reductions were possible due to the San Joaquin River Improvement Project, an important Grassland Bypass Project component, funded by DWR through Propositions 13 and 50. It consists of 6,000 acres of land dedicated for reuse of subsurface drainage water generated by Grassland Area Farmers to grow salt-tolerant crops. DWR continued to provide technical assistance to improve and develop this part of the Grassland Bypass Project.

### **Real-time Water Quality Monitoring Program.**

The Real-time Water Quality Monitoring Program (RTWQMP) collects flow, electrical conductivity, and temperature data from several satellite-linked and web-accessible stations on the mainstem of the San Joaquin River and its tributaries. The information provided can be used by San Joaquin River water managers and stakeholders to improve management and coordination of east side reservoir releases and agricultural and wetland drainage flows to achieve water quality objectives at the San Joaquin River compliance points. In the early stages, RTWQMP was funded by Reclamation and then by CALFED. Currently, DWR has assumed responsibility for funding most of the RTWQMP.

Forecasting flow and salinity conditions on the San Joaquin River allows decision makers to take advantage of the assimilative capacity of the river when available. Data collected from the network of monitoring stations is used with the San Joaquin River Input-Output Day model to generate biweekly forecasts of salinity and flow conditions on the river near Vernalis and other upstream stations. DWR publishes the information weekly on its website.

## Water Conservation Bond Laws

To help local agencies obtain financing for their water management programs, California voters have approved eight bond laws between 1984 and 2006 authorizing DWR to provide low-interest loans and grants to fund project feasibility studies or construction activities. The bond laws are summarized below:

- The Clean Water Bond Law of 1984 (Proposition 25) authorized \$10.5 million for water conservation projects.
- The Water Conservation and Water Quality Bond Law of 1986 (Proposition 44) authorized \$75 million for water conservation and groundwater recharge projects.
- The Water Conservation Bond Law of 1988 (Proposition 82) authorized \$60 million for water conservation, groundwater recharge, and new local water supply improvements.
- The Safe, Clean, Reliable Water Supply Act (Proposition 204), approved in 1996, authorized \$55 million for water conservation, groundwater recharge, and local water supply projects.
- The Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act (Proposition 13), approved in 2000, authorized \$535 million for agricultural and urban water conservation,

groundwater recharge, infrastructure rehabilitation, groundwater storage, and interim reliable water supply projects and studies.

- The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Proposition 50) authorized \$500 million for the Integrated Regional Water Management (IRWM) Grant Program to be implemented jointly by DWR and the SWRCB.
- The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84) authorized \$1 billion to continue the IRWM Grant Program. Under this program, grants and construction loans are available with repayment periods of up to 20 years at reduced interest rates for most programs.
- The Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E) authorized \$300 million for IRWM Stormwater Flood Management.

### Propositions 25, 44, 82, and 204

Funding is fully obligated.

### Proposition 13

Agricultural water conservation loan funding is still available.

All loan and grant funds for the Groundwater Recharge, Infrastructure Rehabilitation, Urban Water Conservation, Groundwater Storage, and Interim Reliable Water Supply programs have been obligated.

### Integrated Regional Water Management Grant Program

The IRWM Grant Program is funded by Propositions 50, 84, and 1E.

### Proposition 50

All Proposition 50 funds have been obligated.

***Propositions 84 and 1E***

In 2012, the IRWM Grant Program awarded \$8 million in planning grant funding to 15 IRWM regions. Planning grants are intended to foster development or completion of IRWM Plans or components thereof, to enhance regional planning efforts. With this award, the planning grant funding from Proposition 84 is fully obligated.



## **Chapter 6**

# **Legislation and Litigation**

*The Sacramento River and Tower Bridge in Sacramento.*



## Significant Events in 2012

Significant legislation related to greenhouse gas reduction, recycled water, rainwater capture, Delta levee maintenance, flood protection, and State water policy passed in 2012.

*Information for this chapter was provided by the Legislative Affairs Office and the Office of the Chief Counsel.*



The Department of Water Resources (DWR) monitors State and federal legislation that affects management of the State Water Project (SWP). Legislative bill tracking involves reviewing legislation at its introduction, evaluating amendments in State Assembly and Senate committee hearings, and monitoring its enactment into law. The DWR Assistant Director for Legislation monitors proposed legislation. The Office of the Chief Counsel tracks State and federal litigation that impacts management of the SWP. The DWR Chief Counsel also manages legal cases that involve SWP operations.

## Legislation

### State Legislation

#### ***AB 685 (Eng; Chapter 524, Statutes of 2012)—State water policy***

Assembly Bill (AB) 685 declares that it is the policy of the State that everyone has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes and directs State agencies to consider this State policy when revising, adopting, or establishing policies, regulations, and grant criteria when those policies, regulations, and criteria are pertinent to the uses of water described in this bill.

#### ***AB 1532 (Perez; Chapter 807, Statutes of 2012)—California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund***

This bill creates the Greenhouse Gas Reduction Fund Investment Plan and Communities Revitalization Act to set procedures for the investment of fee revenues derived from the auction of greenhouse gas allowances pursuant to the cap and trade program of the Air Resources Board.

#### ***AB 1750 (Solorio; Chapter 537, Statutes of 2012)—Rainwater Capture Act of 2012***

This legislation establishes the Rainwater Capture Act of 2012, defining key terms relating to rainwater capture, and authorizes the installation of rainwater capture systems.

#### ***AB 2230 (Gatto; Chapter 545, Statutes of 2012)—Recycled water: car washes***

This bill requires specific new car wash facilities constructed after January 1, 2014, to reuse at least 60 percent of the water or to use recycled water provided by a water supplier for at least 60 percent of its wash and rinse water.

#### ***SB 200 (Wolk; Chapter 549, Statutes of 2012)—Delta levee maintenance***

Senate Bill (SB) 200 extends, until July 1, 2018, the current State cost-share rate for the Delta Levee Maintenance Subventions Program which is set at up to 75 percent of the costs in excess of \$1,000 per levee mile. After that date the cost-share would revert to 50 percent.

#### ***SB 1278 (Wolk; Chapter 553, Statutes of 2012)—Planning and zoning: flood protection: Sacramento-San Joaquin Valley***

This bill extends by 1 year the time frame under which cities and counties must incorporate flood risk information into their general plans and zoning ordinances. It also requires DWR to issue specific floodplain maps and data to assist in this effort.

### Federal Legislation

There was no significant federal legislation in 2012 affecting management of the SWP.

## Litigation

As of December 31, 2012, DWR was involved in, or closely monitored, a number of court cases and other actions related to the management of the SWP.

### Sacramento-San Joaquin Delta Delta Smelt

**Delta Smelt Consolidated Cases (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-407).** *San Luis & Delta-Mendota Water Authority, et al. v. Salazar, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00407); *State Water Contractors v. Salazar, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00480); *Coalition for a Sustainable Delta, et al. v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00422); *Metropolitan Water District of Southern California v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00631); *Stewart and Jasper Orchards, et al. v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00892); *Family Farm Alliance v. Kenneth Salazar, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-01201).

Litigation stemming from a coalition of environmental groups' challenge to the 2005 biological opinion (BO) on Delta Smelt issued by the U.S. Fish and Wildlife Service continued. (Details of this litigation are described in earlier bulletins.)

In March 2011, the federal district court issued a final judgment after finding that the Bureau of Reclamation (Reclamation) unlawfully failed to prepare an adequate National Environmental Policy Act (NEPA) analysis before adopting the 2008 BO, and that the BO was unlawful on several grounds. The court ordered the U.S. Fish and Wildlife Service to prepare a new BO and ordered Reclamation to prepare an environmental impact statement (EIS) pursuant to NEPA.

The parties appealed, and on September 10, 2012, the United States Court of Appeals for the Ninth Circuit heard oral argument and took the matter under submission. No ruling had been made by the end of 2012.

### Salmon

**The Consolidated Salmon Cases (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053).** *San Luis & Delta-Mendota Water Authority, et al. v. Gary F. Lock, as Secretary of the United States Department of Commerce, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053); *Stockton East Water District, et al. v. National Oceanic and Atmospheric Administration, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1090); *State Water Contractors v. Gary F. Locke, Secretary, etc., et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053); *Kern County Water Agency, et al. v. United States Department of Commerce, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1520); *Oakdale Irrigation District, et al. v. United States Department of Commerce, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1580); *The Metropolitan Water District of Southern California v. National Marine Fisheries Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1625).

Litigation initiated in 2004 challenging the National Marine Fisheries Service's (NOAA Fisheries) nonjeopardy BO for salmon on proposed Central Valley Project (CVP)/SWP operations continued. (Details of this litigation are described in Bulletin 132-12.)

On September 20, 2011, the district court issued a memorandum of decision finding in favor of the plaintiffs in part and the defendants in part on the Endangered Species Act issues. The court upheld the BO's jeopardy finding, but it also held that NOAA Fisheries had failed to adequately explain why certain components of the BO were essential to avoid jeopardy or adverse modification of critical habitat. The court also held that NOAA Fisheries violated 50 C.F.R. Section 402.02 by failing to sufficiently

analyze the four factors in the section. The court instructed NOAA Fisheries to prepare a draft BO by October 1, 2014, and the final BO by February 1, 2016. The parties appealed.

During 2012, the parties to the appeal commenced briefing the United States Court of Appeals to the Ninth Circuit on the matter.

***California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance v. California State Water Resources Control Board and California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2010-80000653)***. The conservation groups allege that permit approvals and enforcement failure by the State Water Resources Control Board (SWRCB) has allowed DWR to cause extensive damage to the Bay-Delta Estuary and the fish and wildlife that live there. The administrative record was prepared.

There was no new activity or developments to report for this case in 2012.

### ***Longfin Smelt***

***State Water Contractors v. California Department of Fish and Game, Donald Koch, Director of the California Department of Fish and Game, California Department of Water Resources, Lester Snow, Director of the California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2009-80000203)***. This case, which challenges Incidental Take Permit No. 2081-2009-001-03 issued by the Department of Fish and Wildlife, remains stayed pending completion of the federal litigation challenging the BOs for Delta Smelt and salmonids. (For details about this litigation, see Bulletin 132-12 and earlier bulletins.)

In 2012, the parties agreed to another stay of the matter. The basis for the continued stay is the upcoming potential federal listing of the Longfin Smelt, potential federal BO, and the ongoing Bay Delta Conservation Plan process.

### ***Bay Delta Conservation Plan***

***Central Delta Water Agency, South Delta Water Agency, RC Farms, Inc. and Reclamation District 999 v. California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2010-80000698)***. In October 2010, parties with Delta interests filed a lawsuit challenging DWR's adequacy of environmental analysis for the approval to conduct engineering geotechnical studies in the Delta. The studies are intended to assist DWR in identifying the best options for the construction of a possible isolated conveyance facility.

At a 2011 hearing, the court heard testimony as to whether there was substantial evidence to suggest a potential impact to fish from noise caused by geotechnical drilling in the water.

In 2012, the court found in favor of DWR and denied the petition. The case has been concluded.

***Property Reserve, Inc. v. The Superior Court of San Joaquin County; Department of Water Resources, real party in interest: The Carolyn Nichols Revocable Living Trust v. The Superior Court of San Joaquin County; Department of Water Resources, real party in interest (C067765) Coordinated Proceedings Special Title (Rule 3.550) (C067758, writ denied)***.

Twenty-four Delta property owners declined to grant DWR's request to gain temporary entry onto their properties to perform environmental and geological surveys. DWR sought orders for temporary entry onto the respondents' properties under Code of Civil Procedure Section 1245.010 et seq.

The court granted DWR's request for environmental surveys. However, in April 2011, the court denied DWR's request for geotechnical surveys on the grounds that the proposed surveys were a taking and beyond the scope of studies allowed under Code of Civil Procedure Section 1245.010 et seq.

The Delta landowners appealed the environmental order and DWR filed an appeal from the order denying the geotechnical surveys. After the Third District Court of Appeal denied the landowners' appeal, the landowners took their petitions to the Supreme Court. The Supreme Court granted the petitions and directed the Third District Court of Appeal to reconsider the matter. The Third District Court of Appeal then granted the landowners' request for stay and consolidated the appeals.

With consolidation of the matters on appeal, briefing continued throughout 2012. A hearing has been set for October 25, 2013.

### **Jones Tract**

***Armando P. Vanni, et al. v. Rindge Land Reclamation District #2039 (Super. Ct. San Joaquin County, No. CV025820)***. Three consolidated lawsuits alleging damages arising out of the levee breach on Upper Jones Tract in 2004 went to trial from August 22 to December 29, 2011.

In April 2012, the court entered judgment in favor of DWR. The court found that the plaintiffs failed to show a causal connection between the levee failure and State Water Project operations. The plaintiffs appealed.

### **State Water Resources Control Board Hearing**

SWRCB Water Right Decision 1641 contains a water quality objective requiring DWR to annually maintain 0.7 millimhos per centimeter electrical conductivity at three compliance points within the South Delta, from April 1 through August 31, beginning in 2005. In response to allegations that the water quality objective was not being met and would not be met, the SWRCB issued a cease and desist order, which was final on May 16, 2006, requiring DWR and Reclamation to take corrective actions to eliminate the threat of noncompliance.

After a period of negotiations, the SWRCB issued a final order in 2010, modifying its 2006 order, which extended the schedule to implement measures to meet the water quality objectives pending completion of the SWRCB's review and potential modification of the salinity objectives. The order also required DWR, along with Reclamation, to undertake studies to assess the feasibility of implementing various measures to meet the salinity objectives.

In 2011, DWR began working with the SWRCB and the Delta Watermaster to facilitate lasting solutions to the issues raised in the order. Studies conducted pursuant to the cease and desist order indicate that the salinity experienced in the southern Delta is attributable, in large part, to local sources and not to DWR or Reclamation activities. Through continued coordination with the Delta Watermaster, additional studies were underway in 2012 to determine the sources of this local salinity and explore options for reducing those sources.

### **Hydropower**

#### ***Hyatt-Thermalito***

***Alameda County Flood Control & Water Conservation District, Zone 7 et al. v. State of California Department of Water Resources (C065522)***. Judgment was entered and an appeal was filed by 14 of the 29 State Water Contractors in the 2005 lawsuit alleging that the method used by DWR to allocate costs and revenue of its Hyatt and Thermalito power plants at Lake Oroville violated the terms of long-term water supply contracts.

Briefing has been completed, and oral argument took place on November 16, 2012. The parties are awaiting the decision of the court of appeal.



## **Oroville Relicensing—Federal Energy Regulatory Commission Project No. 2100**

***Butte County et al. v. Department of Water Resources (C071785, app. pending)***. DWR is seeking renewal of the Federal Energy Regulatory Commission (FERC) license for its hydroelectric generation facilities at Oroville (Project No. 2100). DWR filed its relicensing application in 2005. The original 50-year FERC license expired on January 31, 2007. In February 2008, FERC authorized continued operation by issuing an annual license—under the same terms and conditions—that renews each year until FERC issues a new license. (Details of the license renewal negotiations and litigation are described in previous bulletins.)

In January 2012, the court denied the petitioner’s requests to set aside the EIR prepared by DWR and upheld the award to DWR of \$675,087 in charges for the administrative record required to proceed with the suit. The court found that the EIR was legally adequate and noted that the record preparation complied with the California Environmental Quality Act (CEQA) and was reasonable and necessary. The petitioners, Butte and Plumas counties, have appealed.

## **Other Cases**

### ***The Monterey Amendment***

***Central Delta Water Agency et al. v. California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2010-80000561) (Central Delta I); Central Delta Water Agency et al. v. Kern County Water Agency et al., DWR et al., real parties in interest (Super. Ct. Kern County, No. S-1500-CV-270965) (Central Delta II); Rosedale-Rio Bravo Water Storage District and Buena Vista Water Storage District v. DWR (Super. Ct. Kern County, No. S-1500-CV-270635-KCT) (Rosedale-Rio Bravo)***. Legal challenges were brought against the 1995 Monterey Amendment and the EIR adopted by DWR in 2010. (The Monterey Amendment, litigation challenging the amendment and

the first EIR, the settlement of that litigation, development of the second EIR, and litigation prior to consolidation of the cases in Sacramento County Superior Court are described in earlier bulletins.)

*Central Delta I* challenges the EIR adopted by DWR in 2010. Petitioners allege that the EIR fails to comply with CEQA. It is also a reverse validation petition, seeking a declaration that the Monterey Amendment and the transfer of the DWR-owned Kern Water Bank to Kern County Water Agency are invalid.

*Central Delta II* is also a reverse validation petition, seeking a declaration that the transfer of the Kern Water Bank from the Kern County Water Agency to the Kern Water Bank Authority is invalid.

*Rosedale-Rio Bravo*, filed by local public entities in Kern County that are adjacent to the Kern Water Bank, challenges the EIR on its description of the past, present, and future use and operation of the Kern Water Bank lands and their impacts.

*Central Delta II* was stayed pending resolution of the *Central Delta I* case. *Central Delta I* and *Rosedale-Rio Bravo* were coordinated in Sacramento County Superior Court for trial purposes.

On April 25, 2012, the court granted DWR’s request to hear first the reverse validation claims. The trial was held November 2, 2012.

In December 2012, DWR prevailed against the plaintiffs’ reverse validation petitions (including the validity of the Kern Fan Element transfer) on the grounds that the petitions were not timely filed. The court next hears the plaintiffs’ CEQA compliance challenge, unless the plaintiffs appeal and are successful in their appeal to reinstate the validation causes of action.



### **Water Diversions**

***Cortopassi Partners, a California limited partnership and Reclamation District 2086 v. The State of California (Super. Ct. San Joaquin County, No. CV034843)***. Plaintiffs allege that DWR has created and maintained a nuisance in the Sacramento–San Joaquin Delta by artificially diverting water through the Delta for the SWP.

Although the trial for this case was originally set for early 2012, due to a change in attorneys at the Attorney General’s office, the court moved the trial to January 28, 2013.

### **Breach of Contract Arbitration**

***State of California acting by and through the Department of Water Resources v. Whitaker Contractors, Inc., a California corporation; Whitaker Contractors, Inc., a California corporation v. State of California acting by and through the Department of Water Resources (OAH No. A-0031-07)***.

This breach of contract claim arose out of the Tehachapi East Afterbay completion construction project. The contractor failed to perform work according to contract requirements and was terminated. After lengthy arbitration proceedings, on August 11, 2011, the superior court entered a final judgment upholding the termination of the contractor and awarding DWR \$16.4 million. Whitaker appealed the court’s judgment, and as of December 2012, the parties had completed filing their appellate briefs. It is expected the court will soon be scheduling oral arguments. In the meantime, DWR is commencing efforts to collect on the judgment.

### **Colorado River**

**Quantification Settlement Agreement Cases ((2011) Cal.App.4th 758)**. These nine claims, which have been coordinated into a single proceeding before the Sacramento County Superior Court, challenge the Quantification Settlement Agreement (QSA) and associated actions taken to implement

the QSA—a collection of 38 agreements that resolve disputes among water users in Southern California regarding their rights to California’s shrinking share of Colorado River water. (The QSA and earlier litigation activities are described in bulletins from 2007 through 2011.)

In 2012, the respondents 2011 request for Supreme Court Review of this case was denied. On remand from the Court of Appeal, the Sacramento County Superior Court heard oral arguments in November 2012 on how water agencies will share supplies of water from the Colorado River.

### **Area of Origin**

***Solano County Water Agency, Napa County Flood Control and Water Conservation District, City of Yuba City, and County of Butte v. California Department of Water Resources and Does 1–50 (Super. Ct. Sacramento County, No. 34-2008-00016338)***. In July 2008, four SWP water supply contractors—Solano County Water Agency, Napa County Flood Control and Water Conservation District, City of Yuba City, and County of Butte—sued DWR claiming priority to delivery of SWP water and protections from water shortages based on area and watershed of origin statutes, and because they signed SWP water supply contracts. Fourteen SWP contractors located south of the Delta and outside the area of origin have intervened.

The parties continue to engage in settlement discussions. Per stipulation and order on February 9, 2012, the 5-year time limit for trying the matter was tolled.

### **Perris Dam**

***Metropolitan Water District; Coachella Valley Water District; Desert Water Agency, Real Parties; Albert Thomas Paulek v. California Department of Water Resources (Super. Ct. Riverside County, No. RIC1120142)***. On December 21, 2011, Paulek filed a writ petition challenging DWR’s approval of the Perris Dam remediation program final EIR.

The petition raises numerous challenges, including that the EIR does not adequately address and mitigate for impacts on the endangered Stephen's Kangaroo Rat or on various species covered by a multispecies habitat conservation plan.

The case is set for oral argument in the Superior Court of Riverside County in June 2013.

### ***Silverwood Lake***

***Valerie Hamm and Thomas Hamm v. County of San Bernardino, San Bernardino County Flood Control District, Victor Valley Wastewater Reclamation Authority, Mojave Water Agency, State of California (Super. Ct. San Bernardino County (Victorville District), No. 1105980).***

Plaintiffs in this case own property along and in the bed of the Mojave River in Oro Grande. They are suing for damage to their property caused by diverted waters of the vegetation-choked portions of the Mojave River during storms in December 2010.

After DWR produced evidence regarding its operation in the area, plaintiffs amended their complaint and, in 2012, removed DWR from the case.

## Environmental Review Acts

The National Environmental Policy Act (NEPA) (Title 42 United States Code Sections 4321–4347 [1970]) and the California Environmental Quality Act (CEQA) (California Public Resources Code Sections 21000–21177 [1970]) require government agencies to document and consider environmental consequences of their actions in their decision-making processes. NEPA states that it is the goal of the federal government to use all practicable means consistent with other considerations of national policy to protect and enhance the quality of the environment. All federal agencies must prepare an environmental impact statement (EIS), including a discussion of mitigation measures and alternatives, for federal actions that could significantly affect environmental quality.

CEQA is patterned after NEPA. Under CEQA, State and local agencies are required to (1) disclose, through an environmental impact report (EIR), the significant impacts a proposed project would have on the environment, and (2) identify ways to reduce or avoid environmental damage.

CEQA applies to projects directly undertaken, funded, or approved by State or local agencies. NEPA applies to projects directly undertaken, funded, or approved by federal agencies. The Department of Water Resources (DWR) conducts many projects in cooperation with federal agencies. In these cases, both CEQA and NEPA must be followed.

NEPA requires that mitigation measures and alternatives be disclosed to the public in the EIS, but it does not generally require federal agencies to adopt such mitigation measures or alternatives. CEQA does impose substantive duties on all California government agencies approving projects with significant environmental impacts to adopt alternatives or mitigation measures that they find to be feasible to substantially lessen these impacts, unless there are overriding reasons they cannot. When a project is subject to both CEQA and NEPA, both laws encourage agencies to cooperate in planning the project and preparing joint environmental documents.

The environmental review process allows citizens to learn about a proposed project and its potential significant effects and to participate in the decision-making process by providing feedback on agency information. The review process requires agencies to:

- describe the proposed project and the purpose or need for it;
- identify the lead and cooperating agencies involved in the project;
- invite interested parties to participate in the process;
- determine the scope of study with input from responsible agencies and the public;
- prepare and distribute a draft EIS or EIR;
- respond to comments received on the draft;
- prepare the final EIS or EIR;
- make findings and adopt feasible alternatives or mitigation measures to avoid significant effects, if applicable;

## Environmental Review Acts

- adopt a monitoring plan to ensure compliance with mitigation measures; and
- prepare a list of permits required to implement the project if it is approved.

The scoping phase, which occurs early in the review process, is particularly important because it enables government agencies to identify issues and topics to be considered or addressed in the EIS or EIR.

Information gathered in the scoping phase helps agencies identify and evaluate reasonable alternatives, identify potential environmental impacts of the project, determine data and information needed, develop a work schedule, and allocate resources for preparing and distributing the draft environmental document for public review and comment.

NEPA requires a lead agency to involve the public during scoping, while CEQA does not. CEQA, however, does encourage public involvement, and agencies often opt to conduct activities that provide for wide public involvement. Members of the public may raise issues and identify additional alternatives, environmental effects, methods of assessment, and mitigation measures during the scoping phase and continue to participate in the review process for the draft environmental document. Thus, the CEQA process may lead to changes in a project through the development, consideration, and adoption of alternatives or enforceable mitigation measures to avoid or reduce any potential significant adverse effects on the environment.

If the project is approved, the lead agency publishes a document discussing all the factors considered in reaching its decision to proceed with the proposed action. It also discusses whether all practical means to avoid or minimize environmental harm have been adopted, and if not, the reasons they were not.







## **Chapter 7**

# **Water Supply Development and Reliability**

*Castaic Lake on the West Branch of the State Water Project.*

## Significant Events in 2012

In 2012, Yuba County Water Agency (Yuba) delivered 60,000 acre-feet (af) of Component 1 and 21,681 af of Component 3 water for a total of 81,681 af provided to the Department of Water Resources (DWR) under the 2007 DWR/Yuba Water Purchase Agreement. The deliveries were comprised entirely of storage releases (surface flows). No groundwater substitution water was provided in 2012.

Also in 2012, DWR executed an agreement to equally share with the Bureau of Reclamation (Reclamation) the 60,000 af of Component 1 water available to DWR each year from the Lower Yuba River Accord (Yuba Accord). The agreement covers 2012 through 2015.

*Information in this chapter was contributed by the State Water Project Analysis Office, the Division of Integrated Regional Water Management, the Division of Statewide Integrated Water Management, and the Bay-Delta Office.*

The Department of Water Resources (DWR) is working to improve the reliability of State Water Project (SWP) supplies and the long-term water contract annual Table A water allocations delivered to SWP water contractors. Staff is engaged in planning activities to develop additional water supplies and storage capacity.

Developing new water supplies and storage projects that are economically, environmentally, and technically sound, while satisfying institutional requirements and political concerns, presents significant challenges. Many concerns center on possible adverse effects that additional storage and delivery facilities may have locally and on the Sacramento-San Joaquin Delta. In the SWP conveyance system, the Delta is the critical link between water supplies in the Sacramento Valley and deliveries to the rest of the Central Valley and Southern California.

DWR works with the State and federal governments, local agencies, and public interest stakeholder groups to ensure water supply reliability now and in the future. To meet SWP water contractors' needs for sufficient water supplies, DWR is engaged in planning, developing, and providing local assistance with the objective of augmenting future SWP water supplies.

## Supply Development and Reliability

Some of the activities DWR is engaged in to augment future SWP supplies include:

- facilitating transfers between SWP long-term contractors and other agencies, including Central Valley Project (CVP) contractors;
- funding studies on the evapotranspiration of rice and the Giant Garter Snake, a protected species known to inhabit rice growing regions of the Sacramento

Valley, to better understand issues related to the transfer of water made available by crop idling;

- assisting with developing and implementing local and regional conjunctive use programs in the Sacramento Valley;
- constructing a groundwater monitoring network and a subsidence monitoring network to detect potential impacts caused by pumping associated with groundwater substitution transfers;
- managing the Feather River watershed above Lake Oroville to reduce sedimentation in the lake and preserve storage capacity; and
- investigating and evaluating storage projects.

## Water Conveyance Through the SWP

DWR encourages and facilitates temporary transfers of water using SWP conveyance facilities for long-term SWP water contractors and other agencies to help meet local, State, and environmental water supply needs. As a practical matter, SWP facilities are often needed to convey transfer water from the existing place of use to the place of use of the transferee. State law requires DWR to make unused SWP capacity available for transfers upon payment of fair compensation, provided that (1) no legal user of water will be injured; (2) there will be no unreasonable effect on fish, wildlife, or other instream beneficial uses; and (3) there will be no unreasonable effect on the overall economy or the environment of the county from which the water is being transferred



(California Water Code [CWC] Section 1810). Water transfers can involve transfers and exchanges among SWP long-term water contractors, between SWP water contractors and non-SWP entities, or between two or more non-SWP entities.

### ***Transfer and Exchange Evaluations***

An important element of any water transfer is determining what quantity of water, if any, is transferable.

The transferability of water depends on many factors including the source of the water being transferred, what is being done to make water available, when the water can be made available, and the type of water right the existing user holds. Several CWC provisions authorize temporary transfers of water rights issued by the State Water Resources Control Board (SWRCB) (appropriative water rights issued after 1914) and put conditions on the transfers to protect those not involved in them.

Short-term transfers, of less than one year, are authorized under Sections 1725–1732. Long-term transfers, for periods greater than one year, are authorized by Sections 1735–1737. Other CWC sections specify conditions under which water can be transferred and legal protections for those transferring water.

Transfers based on water rights obtained before 1914 are not under the jurisdiction of the SWRCB but must comply with the requirements of the California Environmental Quality Act (CEQA) and possibly the National Environmental Policy Act (NEPA).

The CWC sections noted above contain provisions intended to protect other legal users of water and fish and wildlife from the possible adverse effects of a water transfer. These provisions reflect the concept that changes can be made to the authorized place and purpose of use or point of diversion of

a water supply as long as there is no injury to others as a result of the change (the “no injury rule”). The no injury rule in State water law is intended to protect other legal users from the potential expansion of water use beyond what would have been consumed by the original users in the absence of the transfer. Hence, under the no injury rule, only “new water” is transferable (i.e., water added to the downstream water supply only as a result of the transfer). To protect other users, a transfer would not be authorized to the extent that it would reduce the amount or timing of water that would have been available to downstream users, regardless of the water right priority of those users.

CWC Section 1810(d) requires DWR to consider potential impacts of a transfer on legal users, instream uses, and the economy of the area from which the water would be transferred. DWR must determine whether to allow use of any surplus water conveyance capacity for a transfer. DWR reviews each request to transfer water through SWP facilities to assure that only new water will be transferred. This requirement applies to transfers based on both pre-1914 and post-1914 water rights.

Transfer water is most commonly developed through four methods: surplus water released from storage facilities, substitution of groundwater for transferred surface water, idling agricultural land, and undertaking conservation activities that develop new water. Transfers may result in direct impacts and third-party impacts (impact to parties not involved in the transfer). Certain CWC provisions were enacted to limit potential impacts. For example, additional groundwater pumping from a groundwater substitution program can potentially affect other groundwater users in the area. CWC Section 1745.10 generally requires that transfers of surface water in which groundwater will be pumped to make up for the transferred surface water: (1) be consistent with a groundwater management

plan adopted pursuant to State law for the affected area, or (2) not create or contribute to conditions of long-term overdraft in the affected groundwater basin.

Injury can also occur due to stream depletion induced by increased pumping from wells for groundwater-based transfers. The amount of water depleted from the stream must be deducted from the total groundwater pumped for the transfer or the net surface water flows will not increase as assumed. Consequently, to evaluate possible impacts from groundwater substitution transfers, DWR assesses a streamflow depletion factor, which represents an estimate of the effects of the additional groundwater pumping on the surface water system. Each type of transfer has its own set of potential impacts that must be evaluated to protect parties not involved in the transfer.

With the exception of short-term transfers under CWC Section 1725, which provides for an expedited process for water rights issued by the SWRCB, water transfers are subject to compliance with CEQA and, possibly, NEPA. The CEQA/NEPA and SWRCB processes provide opportunities for public review and comment on water transfer proposals.

Staff in the State Water Project Analysis Office, Division of Operations and Maintenance, Division of Integrated Regional Water Management, and the Office of the Chief Counsel evaluate proposed water transfers to determine whether the transfers will impact the SWP, other water users, the environment, or the area from which the water will be transferred.

### **SWP Delivery Reliability Report**

To assist local agencies assessing their overall water supplies, DWR provided current data on the SWP's ability to deliver water under 2011 conditions and for projected conditions in a biennial report entitled the *State Water Project Delivery Reliability*

*Report 2011*. The 2011 report was finalized in June 2012, and the next update of this report is expected in early May 2014.

Delivery reliability depends on three factors: (1) the availability of water at the source, (2) the ability to convey water from the source to the desired point of delivery, and (3) the level of demand. Information in the 2011 report for projected conditions accounts for the forecast effects of climate change. In addition, the analysis of the ability to convey water from the source to the point of delivery assumes only SWP facilities and permits existing in 2011. In order to provide a conservative estimate of water delivery reliability, no planned facility improvements to the SWP are assumed. Lastly, the level of demand for SWP water, the amount, and the pattern of demand, were derived from historical data and information received from SWP water contractors.

Detailed information on the assumptions, data, and results of additional studies, as well as the other scenarios for annual Table A amounts, can be found in the reliability report, available on DWR's website.

### **SWP Future Water Supply Program**

The Future Water Supply Program coordinates DWR's efforts to implement the Sacramento Valley Water Management Program, provides technical support within DWR for the Lower Yuba River Accord (Yuba Accord), and monitors and assesses conditions of the Sacramento Valley groundwater basin that affect the yield of the SWP. The Future Water Supply Program's goal is to determine the effects of Sacramento Valley groundwater management activities, including water transfers, on SWP water supply reliability, and recommend actions to improve or maintain that reliability.



The Future Water Supply Program's Upper Feather River watershed management component is evaluating the state of the Feather River watershed above Lake Oroville with respect to water management and restoration actions being planned or implemented within the watershed. These actions are intended to improve the ecological and hydrologic function of watersheds, thus affecting base flow, improving flood attenuation, and reducing erosion and sedimentation.

In 2012, DWR continued collaborative efforts with local stakeholders to implement and enhance monitoring activities for assessing the immediate and long-term effects of these actions. The Thompson Creek Meadow Water Budget Study is one such continuing effort that uses detailed monitoring to assess pre- and post-project hydrologic effects.

## Sacramento Valley Water Management Program

The precursor to the current Future Water Supply Program was DWR's work to incorporate conjunctive-use projects in the Sacramento Valley into the SWP to increase SWP dry-year yield. Similar projects were proposed to be implemented by the Sacramento Valley Water Management Agreement, which was signed by stakeholders in early 2003.

For more information on issues surrounding the Sacramento Valley Water Management Agreement, see Bulletins 132-02, 132-03, and 132-04, available on DWR's website.

## SWP Water Rights Activities

### Water Right Permits

SWP operations are governed by the terms and conditions contained in DWR's water right permits and licenses along with other State and federal regulatory restrictions, including biological opinions (BOs) for the protection of endangered species. DWR

holds water right permits authorizing SWP operations at each of the SWP facilities, including the Oroville and Delta facilities (which include the North Bay Aqueduct), for water supply purposes. Each permit specifies the authorized quantities of direct diversion and diversion to storage, place of use, purpose of use, and time within which the permitted quantities must be put to beneficial use. A change in any of the terms and conditions contained in the water right permits and licenses, including a change in the place or purpose of use or point of diversion, requires SWRCB approval.

Diversion and use of SWP water throughout the SWP service area has increased since initial operations in the 1960s. However, due to a number of factors, including operational and regulatory constraints, the beneficial use of water has not yet reached the maximum quantities anticipated for full development of the SWP.

One petition for change to DWR's SWP water rights permits was filed in 2012. On May 18, DWR and the Bureau of Reclamation (Reclamation) filed a joint petition for change to consolidate the SWP and CVP authorized places of use to facilitate transfers and exchanges of SWP and CVP water. The consolidation of the SWP and CVP places of use provided the two projects with the operational flexibility to manage the available SWP and CVP supply as efficiently as possible. The SWRCB issued an order approving the change on July 6, 2012. The change facilitated three exchanges between the SWP, CVP, and their respective contractors, totaling 37,320 acre-feet (af) of water.

## Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

The Delta and Suisun Marsh are located where California's two major river systems, the Sacramento and the San Joaquin, converge and flow westward to meet

incoming seawater tides flowing through the San Francisco Bay. The watershed of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Estuary) is a critical source of water supply for much of California. The watershed is a source of drinking water for two-thirds of the State's population; it supplies some of the State's most productive agricultural areas; and it provides water for fish, wildlife, and other public trust uses of water within and upstream of the estuary.

Water originating in the Bay-Delta watershed is delivered to areas within the watershed and to areas south and west of the estuary. The largest water distribution systems that release stored water into the Delta and directly divert water from the Delta are the SWP, operated by DWR, and the federal CVP, operated by Reclamation. Numerous other water storage and diversion projects influence Bay-Delta Estuary inflows, outflows, water quality, and other hydrologic characteristics.

The SWRCB regulates both the quality of water in the Bay-Delta Estuary and the diversion and use of water released into and diverted from the estuary for water supply. The SWRCB coordinates its regulatory authorities under State laws governing water quality and water rights, ensuring that water quality is protected for all beneficial uses when water is diverted from the estuary.

In 1999, the SWRCB adopted Water Right Decision 1641 (later modified by Order WR 2000-02) modifying the terms and conditions of a number of water right permits and licenses, primarily those for the SWP and CVP, to implement the objectives of the 1995 water quality control plan.

Under its authority to protect beneficial uses of water, the SWRCB adopted the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) on December 13, 2006

(Resolution No. 2006-0098). The Bay-Delta Plan contains objectives for flow, salinity, dissolved oxygen levels, and other parameters necessary for protection of various beneficial uses such as municipal and industrial, agricultural, and fish and wildlife. The SWRCB implements these objectives in part or in whole, depending on the circumstances, through conditions on water right permits and licenses.

### SWRCB Bay-Delta Proceedings—2012 Activities

In 2012, SWRCB proceedings examined a number of issues in the Bay-Delta Estuary relating to water quality, protection of beneficial use for agriculture and fish and wildlife, and salinity issues, among others, which have the potential to affect Delta water supply and reliability.

### 2006 Bay-Delta Plan Review

Water Code Section 13240 requires that the water quality control plan be periodically reviewed. Federal Clean Water Act Section 303(c) (33 U.S.C. Section 1313(c)) requires a triennial review of State water quality "standards," as defined in the act. A workshop on October 8, 2008, formally began a review of the 2006 Bay-Delta Plan.

The review and amendment process for the 2006 Bay-Delta Plan consists of:

- identifying elements that may need amendment or new elements that may need to be added;
- preparing any amendments or revisions to the entire water quality control plan; and
- SWRCB's adoption of some or all of the amendments or revisions.

SWRCB information-gathering activities may affect the scope of the Bay-Delta Plan review and may include evidentiary hearings on critical issues concerning the Delta's

ecology. The Bay Delta Conservation Plan environmental review may provide some of the analyses needed for the comprehensive Bay-Delta Plan review.

SWRCB's ongoing review and update of the 2006 Bay-Delta Plan continued in 2012.

**Southern Delta Salinity and San Joaquin River Flow Objectives.** In December 2012, the SWRCB released, for public review and comment, a draft substitute environmental document in support of potential changes to San Joaquin River flow and southern Delta water quality objectives and a program of implementation to be included in the Bay-Delta Plan. The proposal is intended to balance the use of water for fishery protection against competing uses such as municipal supply, agriculture, and hydropower. This is considered Phase 1 of a four-phased process of developing and implementing updates to the 2006 Bay-Delta Plan and flow objectives for priority tributaries to the Delta to protect beneficial uses in the Bay-Delta watershed.

Phase 2 includes the review and potential modification of Delta outflows, SWP and CVP export restrictions, and other requirements in the Bay-Delta to protect fish and wildlife beneficial uses. Phase 2 was initiated with three public workshops in 2012. The workshops were held to gather information and discuss the scientific and technical basis for considering potential changes to the 2006 Bay-Delta Plan. Topics discussed included ecosystem changes and the low salinity zone; Bay-Delta fishery resources (focusing on pelagic fishes and salmonids); and analytical tools for evaluating the water supply, hydrodynamic, and hydropower effects of the Bay-Delta Plan.

For more information about water quality objectives and compliance monitoring in the South Delta, see Chapter 4, Water Quality Programs.

## Storage Program

DWR is the State lead agency for the Storage Program, which consists of surface storage studies and groundwater programs and projects. The Storage Program began under the CALFED Bay-Delta Program. (For background on the CALFED Bay-Delta Program, see Bulletins 132-95 through 132-11.)

The Storage Program is a comprehensive program with potential benefit for the SWP consisting of actions related to surface and groundwater storage. DWR's Division of Statewide Integrated Water Management and Division of Integrated Regional Water Management have been working with State and federal agencies to enhance storage and conjunctive-use programs that support local project development via loans and grants. The Storage Program is part of an ongoing evaluation of how storage, both groundwater conjunctive use and surface storage, can help meet California's urban, agricultural, and environmental water supply reliability, ecosystem restoration, and water quality needs.

## Surface Storage Investigations

Surface storage investigations are developing environmental documentation and feasibility studies for four of the five surface storage projects identified for further study in the CALFED record of decision.

### *Los Vaqueros Reservoir Expansion Project*

Contra Costa Water District owns and operates the 100,000 af Los Vaqueros Reservoir just southwest of the Sacramento-San Joaquin Delta. The Los Vaqueros Reservoir Expansion Project involves analysis of increasing reservoir storage by as much as 175,000 af, for a potential storage capacity of up to 275,000 af.

The project objectives are: (1) to develop water supplies for environmental water

management; (2) to increase water supply reliability within the San Francisco Bay Area; and (3) to the extent possible, improve the quality of water deliveries to municipal and industrial customers without impairing the project's ability to meet the first two objectives.

The Contra Costa Water District Board certified a final environmental impact report and approved an expansion from 100,000 af to 160,000 af on March 31, 2010. The expansion was completed and dedicated July 13, 2012.

With additional funding, local, State, and federal partners may choose to continue to study the feasibility of a 275,000 af expansion alternative in the context of other Delta initiatives to improve Delta conveyance and better protect Delta fisheries, including long-term programs being explored in the Bay Delta Conservation Plan.

### ***Shasta Lake Water Resources Investigation***

Reclamation, in coordination with other agencies, is studying the feasibility of expanding Shasta Dam and Lake, primarily to promote increased survival of anadromous fish populations in the upper Sacramento River and to increase water supply reliability. An enlargement of Shasta Dam would inundate additional lands around the existing reservoir and affect a portion of the McCloud River. California Public Resources Code Section 5093.542(c), the Wild and Scenic Rivers Act, states that, "except for participation by the Department of Water Resources in studies involving the technical and economic feasibility of enlargement of Shasta Dam, no department or agency of the state shall assist or cooperate with, whether by loan, grant, license, or otherwise, any agency of the federal, state, or local government in the planning or construction of any dam, reservoir, diversion, or other water impoundment facility that could have an

adverse effect on the free-flowing condition of the McCloud River, or on its wild trout fishery."

The State budget does not include funding for DWR to continue participating in this study. However, Reclamation's planning is ongoing. In February 2012, Reclamation released a preliminary draft environmental impact statement and a draft feasibility report.

### ***North-of-the-Delta Offstream Storage Investigation***

DWR and Reclamation are working in partnership with local, State, and federal agencies to further study north-of-the-Delta offstream storage opportunities. The North-of-the-Delta Offstream Storage Investigation focuses on potential projects on the west side of the Sacramento Valley, including Sites Reservoir.

Storing water in offstream reservoirs during excess flow periods could provide opportunities to increase water storage in an environmentally sensitive manner. The stored water can then be made available to enhance water management flexibility in the Sacramento Valley and the Bay-Delta Estuary, reducing water diversions on the Sacramento River during critical fish migration periods, increasing the reliability of supplies for the Sacramento Valley and statewide, and providing storage and operational flexibility to support environmental enhancement actions and adapt to climate change.

North-of-the-Delta Offstream Storage Investigation studies were ongoing in 2012.

### ***Upper San Joaquin River Basin Storage Investigation***

DWR and Reclamation, in coordination with other State and federal agencies, are evaluating opportunities for increased storage in the upper San Joaquin River



watershed. The objectives of the Upper San Joaquin River Basin Storage Investigation are to: (1) increase water supply reliability and operational flexibility in the CVP's Friant Division, other San Joaquin Valley areas, and other regions, and (2) enhance water temperature and flow conditions in the San Joaquin River in support of San Joaquin River restoration efforts. Other opportunities include additional hydropower generation, reduction of flood damages, water quality improvements, and recreation site development.

In May 2009, Reclamation and DWR released a plan formulation report for the Upper San Joaquin River Basin Storage Investigation that described the alternative formulation, evaluation, and comparison activities that led to selection of Temperance Flat RM 274 Reservoir for detailed feasibility-level evaluation. The report described the progress of the study to date and included additional information on the economics, operations, and costs of Upper San Joaquin River Basin Storage Investigation alternatives. It also defined a set of alternative plans to be considered in the study's feasibility report and environmental impact statement/environmental impact report.

The study continued in 2012 with draft and final feasibility studies and environmental documents scheduled for 2014 and 2015.

## Delta Conveyance Program

The Conveyance Program previously consisted of projects proposed in the North and South Delta. As a result of the efforts associated with Bay Delta Conservation Plan and the Delta Stewardship Council's *Delta Plan*, many of these efforts were suspended as staff was redirected to work on the SWP Delta Compliance Program. The remaining projects are discussed briefly below; more detailed information about the Delta can be found in Chapter 2, Delta Resources.

## SWP Delta Compliance Program

The SWP obtained take authorization for federal and California Endangered Species Act listed species through the December 2008 U.S. Fish and Wildlife Service BO for Delta Smelt; the February 2009 Department of Fish and Wildlife incidental take permit (ITP) for Longfin Smelt; and the June 2009 National Marine Fisheries Service (NOAA Fisheries) BO for salmon, steelhead, and Green Sturgeon. Many of the regulatory requirements will require studies and projects, which are currently underway.

### Ad Hoc Studies

In January 2012, a joint stipulation was filed in the consolidated salmonid cases litigation regarding the 2009 NOAA Fisheries BO. The 2012 Stipulation Study was undertaken to gain more information about the effects of SWP and CVP export operations on juvenile steelhead and fall-run Chinook salmon; gain a better understanding of Old River and Middle River reverse flows on steelhead route selection and survival in the South Delta; and pilot an approach to manage water export risks to Endangered Species Act listed salmonids. The study was successfully planned and completed and was the first of its kind to utilize real-time data to inform in-season management and water operations.

### North Delta

With the North Delta Flood Control and Ecosystem Restoration Project, solutions to improve flood management and the ecosystem are being considered, including setback levees, detention basins, dredging, and levee degradation for floodplain expansion. For more information about this project, see Chapter 2, Delta Resources.

### South Delta

Actions in the South Delta include the South Delta Improvements Program (SDIP), implementing flood control and ecosystem improvements in the lower San Joaquin



River, completion of an intertie between the SWP California Aqueduct and CVP's Delta-Mendota Canal, and continuation of DWR's Temporary Barriers Program.

SDIP is a two-stage project. Stage 1 proposes to reduce the movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via Old River and to maintain adequate water levels and water quality for agricultural diversions in the South Delta. Stage 2 would increase water deliveries and delivery reliability to SWP and CVP contractors south of the Delta and increase the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay.

The SDIP final environmental impact report/environmental impact statement (2006) evaluated alternatives and proposed proceeding with SDIP Stage 1. This component involves constructing permanent operable gates and channel dredging in the South Delta. DWR is proposing installation of these permanent gates to replace temporary rock barriers currently installed and removed each year under DWR's Temporary Barriers Program.

Reclamation and DWR's 2008 biological assessment for the SWP and CVP Operations Criteria and Plan included operation of the SDIP permanent operable gates.

The U.S. Fish and Wildlife Service BO, issued in December 2008, concluded that coordinated operations of the CVP and SWP would jeopardize Delta Smelt. The U.S. Fish and Wildlife Service provided a reasonable and prudent alternative under which SDIP could move forward.

The NOAA Fisheries BO, issued in June 2009, concluded that CVP and SWP operations would jeopardize a number of anadromous species, in particular Chinook Salmon. NOAA Fisheries provided no reasonable and

prudent alternative for SDIP. DWR initiated discussion with NOAA Fisheries in late 2009 to establish what actions could lead to a reasonable and prudent alternative under which SDIP could move forward; however, NOAA Fisheries stated an interest in holding off on further discussion until completion of an on-going multiyear South Delta Temporary Barriers Program predation study. The study field data collection has been completed, and data analysis is in progress. Data from the study will be useful in considering permanent barrier design options and operation strategies to minimize predation.

Any action regarding SDIP Stage 2 will require further study and public input. Stage 2 planning continued to be suspended in 2012.

For additional information about the Temporary Barriers Program, see Chapter 2, Delta Resources.

## Lower Yuba River Accord

The Yuba Accord's purpose is to resolve instream flow issues and protect and enhance lower Yuba River fisheries and local water supply reliability. The Yuba Accord provides revenues for local flood control and water supply projects; water to enhance SWP and CVP water supply reliability by offsetting Delta export reductions for protection and restoration of Delta fisheries; and improvements in statewide water supply management, including dry year supplies for participating SWP and CVP contractors.

The Yuba Accord is based on three agreements, as follows:

- a water purchase agreement with DWR;
- conjunctive use agreements with Yuba County Water Agency (Yuba) member units; and
- a fisheries agreement.

Three amendments were executed in 2009 and 2010 to address a technical refill issue and groundwater substitution pricing issues.

For additional details about the Yuba Accord, see Chapter 9, Water Contracts and Deliveries.

Amendment No. 4 was executed in 2012 between DWR and Yuba, and between DWR and 22 participating contractors, to streamline the process for addressing groundwater substitution pricing issues from 2012 through 2015. The parties pursued the negotiation process provided in Amendment No. 4, but did not agree on the price for groundwater substitution transfers in 2012. Yuba subsequently notified DWR that it would offer no Component 4 water in 2012.

The water purchase agreement transfers water to help offset Delta export reductions annually and provides dry-year transfer water for SWP and CVP contractors from surface and groundwater substitution sources.

In 2012, Yuba delivered 60,000 af of Component 1 and 21,681 af of Component 3 water for a total of 81,681 af provided to DWR under the 2007 DWR/Yuba Water Purchase Agreement. The deliveries were comprised entirely of storage releases (surface flows). No groundwater substitution water was provided in 2012. The storage releases included 20,000 af of supplemental surface releases from June through August. An additional 4,138 af of Yuba releases was backed into Lake Oroville during balanced conditions in February 2012, but was displaced (“spilled”) when Lake Oroville made flood-control releases in May. In October, Yuba released another 16,381 af of surface water that DWR backed into Lake Oroville for later transfer, provided it can be retained in storage through the winter and transferred in 2013.

Also in 2012, DWR executed an agreement to equally share with Reclamation the 60,000 af of Component 1 water available to DWR each year from the Yuba Accord. The agreement covers 2012 through 2015.



## Chapter 8 Water Supply

*Sierra snow.*



## Significant Events in 2012

**W**ater year 2011–2012 proved to be a dry year, with less than average precipitation and mountain snowpack. The State received precipitation at 77 percent of average in 2011–2012, compared to 136 percent of average in 2010–2011. Though a below-average water year, the Northern Sierra 8-Station Precipitation Index had the second driest December and seventh wettest March on record. More than 55 percent of the water year precipitation in the Northern Sierra 8-Station Precipitation Index fell during January and March; 72 percent fell during January, March, and April. The statewide mountain snowpack peaked at 60 percent of its April 1 average in mid-April.

Statewide river runoff totaled 62 percent of average in the 2011–2012 water year. The Feather River runoff totaled 63 percent of average. Water year runoff totals in the Sacramento River Region, San Joaquin 4 Rivers, and Tulare Lake Region were well below average. Whereas, in the prior water year (2010–2011), runoff for those three regions were significantly above average.

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were “below normal” and “dry,” respectively, based on observed data for water year 2011–2012.

*Information in this chapter was contributed by the Division of Flood Management and the Division of Operations and Maintenance.*

The Department of Water Resources (DWR) monitors precipitation, estimates mountain snowpack, calculates river runoff, and operates storage facilities during each water year. The official California water year runs from October 1 through September 30. DWR works during the water year to fulfill its key contractual obligations to the State Water Project (SWP) long-term water supply contractors.

## California's Hydrology

DWR divides California into 10 hydrologic regions. Each hydrologic region corresponds to the State's major water drainage basins. Annual precipitation, mountain snowpack, and runoff data is collected and analyzed for the hydrologic regions and used to determine water year type classifications and forecasts for the State's water supply outlook.

The State's precipitation is measured using two primary indices, the Northern Sierra 8-Station Index and the San Joaquin 5-Station Index.

Runoff estimates are determined for the Sacramento River Region (SRR), the San Joaquin 4 Rivers (SJR), and the Tulare Lake Region (TLR). The SRR is the sum of the unimpaired flow into the Sacramento River, Feather River, Yuba River, and American River at designated gauging stations. The SJR is determined by summing the unimpaired flow into the Stanislaus River, Tuolumne River, Merced River, and San Joaquin River at designated gauging stations. The TLR is the sum of the unimpaired flow of the Kings River, Kaweah River, Tule River, and Kern River at designated gauging stations.

The Eight River Index is used to determine the duration of fish and wildlife salinity and flow standards at Chipps Island or Port Chicago from February through June. This index is the sum of the unimpaired runoff from the eight rivers in the SRR and SJR.

Two water supply indices, Sacramento Valley 40-30-30 and San Joaquin

Valley 60-20-20 are used to derive the water year classification for the Sacramento Valley and the San Joaquin Valley, respectively, and are used by various water agencies to formulate water supply decisions. For more information, see the sidebar, Precipitation, Runoff, and Water Supply Indices.

DWR continually updates hydrologic data and information. If your research requires more current data than was available at the time of publication, please consult the most recent edition of Bulletin 120, Bulletin 132, and/or contact DWR staff in the Hydrology and Flood Operations Office.

## Water Year 2011–2012

### Precipitation

California experienced below-average rainfall and mountain snowpack during water year 2011–2012. The State received precipitation at 77 percent of average in 2011–2012, compared to 136 percent of average in 2010–2011. Figure 8-1 presents water year precipitation for the various regions of the State. The Northern Sierra 8-Station Precipitation Index finished the water year with 41.6 inches of precipitation, which was 83 percent of average. The statewide average snow water equivalent, based on snow sensors, reported for April 1 was 15.3 inches, or 54 percent of average. Historically, April 1 is the average annual date of peak snow accumulation. This water year, the statewide mountain snowpack peaked in mid-April at 17.5 inches.





Figure 8-1 Statewide Precipitation by Hydrologic Region, 2011–2012 Water Year, as Percent of Average

## Precipitation, Runoff, and Water Supply Indices

### Precipitation

#### Northern Sierra 8-Station Precipitation Index

In the northern Sierra Nevada, precipitation is indexed by averaging rain gauge totals at eight representative stations, creating what is known as the Northern Sierra 8-Station Precipitation Index. The eight stations are: Mount Shasta City, Shasta Dam, Mineral, Quincy, Brush Creek, Sierraville Ranger Station, Blue Canyon, and Pacific House. The index provides a representative sample of the major watersheds (upper Sacramento, Feather, Yuba, and American rivers) and serves as a wetness index for the Sacramento River hydrologic region.

#### San Joaquin 5-Station Precipitation Index

In the central Sierra Nevada, precipitation is indexed by averaging rain gauge totals at five representative stations, creating what is known as the San Joaquin 5-Station Precipitation Index. The five stations are: Calaveras Big Trees, Hetch Hetchy Reservoir, Yosemite Valley, North Fork Ranger Station, and Huntington Lake. The index provides a representative sample of the major watersheds (Stanislaus, Tuolumne, Merced, and San Joaquin rivers) and serves as a wetness index for the San Joaquin River hydrologic region.

### Runoff

#### Sacramento River Region (SRR)

Sacramento River Region is the sum of unimpaired flow in million acre-feet (maf) at the Sacramento River above Bend Bridge, Feather River at Oroville (inflow to Lake Oroville), Yuba River near Smartville, and American River below Folsom Lake. The Sacramento Valley unimpaired runoff represents the natural water production of the Sacramento River basin, unaltered by upstream diversions, storage, or export of water to or import of water from other basins.

SRR was previously known as the “Sacramento River Index,” and was used to determine water year type classifications under State Water Resources Control Board (SWRCB) Water Right Decision 1485. The “Sacramento River Index” is no longer used as a water supply index.

#### San Joaquin 4 Rivers (SJR)

San Joaquin 4 Rivers is the sum of unimpaired flow in maf at the Stanislaus River below Goodwin Dam (inflow to New Melones Reservoir), Tuolumne River below La Grange (inflow to New Don Pedro Reservoir), Merced River below Merced Falls (inflow to Lake McClure), and San Joaquin River inflow to Millerton Lake.

#### Tulare Lake Region (TLR)

Tulare Lake Region is the sum of unimpaired flow in maf of the Kings River below Pine Flat Reservoir, Kaweah River below Terminus Reservoir, Tule River below Lake Success, and Kern River below Lake Isabella.

#### Eight River Index

This index is the sum of the unimpaired runoff from eight rivers—four in the Sacramento Valley (SRR) and four in the San Joaquin Valley (SJR). This index determines the duration of the fish and wildlife salinity and flow standards at Chipps Island or Port Chicago from February through June.

## Precipitation, Runoff, and Water Supply Indices (continued)

### Water Supply Indices

#### Sacramento Valley 40-30-30 Index

SWRCB Water Right Decision 1641 (D-1641) applies the Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index), a water supply forecasting tool, to derive the water year type for the Sacramento Valley. SWRCB first introduced the Sacramento Valley 40-30-30 Index in the 1991 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan), and continued using it with the 1995 Bay-Delta Plan. D-1641 implements portions of the 1995 Bay-Delta Plan with respect to the operation of the State Water Project and the Central Valley Project.

The Sacramento Valley 40-30-30 Index is used to determine the Sacramento Valley water year type for the purpose of implementing water quality objectives defined in D-1641. It also provides an estimate of the potential water supply originating in the basin from rainfall and snowmelt runoff, groundwater accretion, and reservoir carryover storage. The Sacramento Valley 40-30-30 Index incorporates seasonal differences in water contribution for the year and includes the prior year’s conditions in order to establish a more reliable index of water availability. The 40-30-30 factors represent the percentage weight given to the following:

- (1) 40%—the current year’s April through July Sacramento Valley unimpaired runoff;
- (2) 30%—the current year’s October through March Sacramento Valley unimpaired runoff; and
- (3) 30%—the previous year’s index with a cap of 10 maf (to account for required flood control reservoir releases during wet years).

The water year type is determined by the index value on a scale specific to the Sacramento Valley (as defined in D-1641).

Classification	Index (million acre-feet)
Wet	Equal to or greater than 9.2
Above Normal	Greater than 7.8 and less than 9.2
Below Normal	Equal to or less than 7.8 and greater than 6.5
Dry	Equal to or less than 6.5 and greater than 5.4
Critical	Equal to or less than 5.4

Water year type forecasts are made beginning in February. The Sacramento Valley 40-30-30 Index May 1 forecast (at the 50 percent exceedance level) determines the “official” water year type for implementing water quality and flow requirements contained in D-1641. The D-1641 objectives are conditioned by water year type and generally become less stringent during dryer years.

#### San Joaquin Valley 60-20-20 Index

D-1641 uses a similar method to determine the water year type for the San Joaquin Valley. The San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) uses (1) the current year’s April through July San Joaquin Valley unimpaired runoff (60 percent); (2) the current year’s October through March San Joaquin Valley unimpaired

runoff (20 percent); and (3) the previous year’s San Joaquin Valley 60-20-20 Index (20 percent, with a cap of 4 maf to account for required flood control reservoir releases during wet years).

The water year type is determined by the index value on a scale specific to the San Joaquin Valley (as defined in D-1641).

Classification	Index (million acre-feet)
Wet	Equal to or greater than 3.8
Above Normal	Greater than 3.1 and less than 3.8
Below Normal	Equal to or less than 3.1 and greater than 2.5
Dry	Equal to or less than 2.5 and greater than 2.1
Critical	Equal to or less than 2.1

The San Joaquin Valley 60-20-20 Index May 1 forecast (at the 75 percent exceedance level) determines the “official” water year type for D-1641 San Joaquin River Vernalis flow standards.

Table 8-1 presents monthly precipitation totals for water year 2011–2012 at various gauges located throughout the State, listed north to south. Statewide, the wettest months were January, March, and April. In contrast, December and February were the driest (with December 2011 being one of the driest Decembers on record for California). Precipitation in January ranged from dry in the south to near normal for the north. The greatest portion of precipitation for the north fell in a 7-day window ending on January 26, 2012. March had several colder storms throughout the month, grading from wet in the north to dry in the desert southwest region.

Eureka Woodley Island on the north coast of California received 41.0 inches of precipitation for a water year total that was 107 percent of average. Precipitation for the station was above normal for 6 months of the 2011–2012 water year. March accumulated the largest quantity of precipitation for the water year, with 12.0 inches (231 percent of average).

Blue Canyon experienced precipitation above normal for 5 months of water year 2011–2012. The station totals for the water year were 57.3 inches and 91 percent of average. The month of March accumulated the largest precipitation and percent of normal for the water year—21.9 inches, which was 257 percent of average.

Areas of the Central Valley received above-normal precipitation for the months of October, March, and April. Precipitation totals during those months for Sacramento were 1.7, 4.5, and 2.4 inches (187, 186, and 164 percent of average) and for Fresno 0.9, 2.4, and 2.0 inches, respectively, (188, 131, and 187 percent of average).

In the San Joaquin and Tulare Lake watersheds, water year total precipitation was well below average. The largest amounts of precipitation fell in these watersheds during the months of January, March, and April which is similar to what transpired in Northern California. Nearly 70 percent of the water year precipitation

**Table 8-1 Monthly Precipitation Totals at Various Locations in California during Water Year 2011–2012**

Station <sup>a</sup>	Monthly Precipitation (inches)															
	Water Year 2011–2012												Water Year 2012–2013			
	2011			2012									WY			
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Oct	Nov	Dec
Mount Shasta City	2.27	3.46	0.46	6.03	2.81	12.31	5.75	0.64	1.92	0.08	0.03	0.00	<b>35.76</b>	1.18	10.71	10.82
percent of average	97	75	8	94	50	280	205	38	181	32	10	0	<b>99</b>	50	233	184
Eureka Woodley Island	4.21	3.86	2.22	7.76	2.63	12.02	4.76	0.77	2.00	0.67	0.07	0.04	<b>41.01</b>	2.72	6.36	10.97
percent of average	141	70	35	119	51	231	166	43	328	609	29	5	<b>107</b>	91	115	171
Blue Canyon (DWR-2)	5.33	3.67	0.33	9.91	4.67	21.85	8.79	0.64	1.65	0.42	0.04	0.00	<b>57.30</b>	5.08	17.76	19.46
percent of average	142	47	3	80	48	257	175	24	188	200	11	0	<b>91</b>	135	225	186
Sacramento WB City	1.72	0.87	0.07	2.52	0.94	4.45	2.42	0.00	0.03	0.03	0.00	0.00	<b>13.05</b>	1.28	3.97	6.15
percent of average	187	43	2	67	29	186	164	0	23	100	0	0	<b>73</b>	139	196	193
San Francisco WB AP	1.38	1.55	0.14	2.16	0.66	5.97	2.79	0.02	0.09	0.00	0.00	0.00	<b>14.76</b>	1.47	4.50	7.11
percent of average	130	65	4	49	20	216	196	5	60	0	0	0	<b>74</b>	139	190	191
Yosemite Headquarters	2.80	1.07	0.00	5.11	2.24	5.97	4.78	0.28	0.64	0.08	0.00	0.00	<b>22.97</b>	1.15	4.90	10.49
percent of average	163	25	0	76	36	121	148	20	112	29	0	0	<b>62</b>	67	116	159
Fresno WB AP	0.90	0.67	0.00	1.38	0.75	2.43	2.02	0.00	0.00	0.00	0.00	0.00	<b>8.15</b>	0.25	1.11	2.03
percent of average	188	60	0	69	36	131	187	0	0	0	0	0	<b>75</b>	52	100	115
Grant Grove	4.10	2.68	0.00	6.40	1.56	6.88	6.37	0.26	0.25	0.00	0.04	0.00	<b>28.54</b>	1.23	3.97	12.52
percent of average	209	52	0	86	22	91	147	22	89	0	57	0	<b>65</b>	63	77	160
Los Angeles WSO AP	0.63	1.69	0.67	1.19	0.12	1.78	1.51	0.01	0.00	0.00	0.00	0.00	<b>7.60</b>	0.15	1.31	2.82
percent of average	166	120	32	44	4	95	164	7	0	0	0	0	<b>60</b>	39	93	134
San Diego NWS Lindbergh Field	0.46	3.12	0.86	0.40	1.19	0.97	0.88	0.02	0.00	0.00	0.00	0.00	<b>7.90</b>	0.70	0.28	2.19
percent of average	110	276	45	20	62	60	116	10	0	0	0	0	<b>76</b>	167	25	115

<sup>a</sup> AP = Airport; NWS = National Weather Service; WB = Weather Bureau; WSO = Weather Service Office; WY = Water Year (October 1–September 30)

fell during these months for Yosemite Headquarters and Grant Grove. Water year precipitation totals at those two sites were below average with 62 and 65 percent of their respective annual averages.

Further south, the cities of Los Angeles and San Diego were also below average, totaling 60 and 76 percent of their annual averages for the water year, respectively. San Diego received 3.1 inches of precipitation in November, which is 276 percent of the monthly average and about 40 percent of the total precipitation falling during the 2011–2012 water year.

The monthly totals for the Northern Sierra 8-Station Precipitation Index for the water

year are presented in Table 8-2. Precipitation totaled 41.6 inches, which was 83 percent of average. December was extremely dry, registering 0.3 inches and 4 percent of the monthly average. The total accumulated precipitation during the December 1 through February 28 period, typically the wettest period in the Sierra Nevada, only amounted to 10.9 inches or 45 percent of the average for this period. The 15.7 inches in March ranked as the seventh wettest month on record for the index.

Taking the entire water year into consideration, approximately 72 percent of the water year total precipitation fell during January, March, and April. The precipitation in January was primarily the result of intense storms over a few days. The precipitation



**Table 8-2 Northern Sierra 8-Station Precipitation Index for Water Year 2011–2012**

	Month	Precipitation (inches)	Percent of Monthly Average
2011	October	3.90	130
	November	2.70	43
	December	0.30	4
2012	January	7.60	84
	February	3.00	38
	March	15.70	228
	April	6.50	167
	May	0.50	24
	June	1.20	120
	July	0.20	100
	August	0.00	0
	September	0.00	0
<b>Total</b>		<b>41.60</b>	<b>83</b>

in March and April was spread throughout each month.

### Mountain Snowpack

The precipitation that fell during water year 2011–2012 resulted in a mountain snowpack well below average throughout the State’s mountainous regions. Monthly statewide mountain snowpack for the water year is shown in Table 8-3. Snow water equivalents shown in the table were obtained from daily snow sensor reports corresponding to the first day of each month. The statewide average snow water equivalent reported for April 1 was 15.3 inches or 54 percent of average. April 1 is typically the average annual date of peak snow accumulation; however, the mountain snowpack peaked on April 15 at approximately 17.5 inches of snow water content.

### River Runoff

Statewide river runoff totaled 62 percent of average in the 2011–2012 water year. The monthly runoff totals for the Sacramento

**Table 8-3 Statewide Mountain Snowpack for Water Year 2011–2012**

	Date	Snow Water Equivalent (inches)	Percent of Average	Percent of April 1 Average <sup>a</sup>
2011	October 1	0	0	0
	November 1	0	0	0
	December 1	1.9	42	7
2012	January 1	2.0	20	7
	February 1	6.4	37	23
	March 1	8.4	34	30
	April 1	15.3	54	54
	May 1	8.7	39	30
	June 1	0.2	3	1
	July 1	0	0	0
	August 1	0	0	0
	September 1	0	0	0

<sup>a</sup> April 1 is the average date of peak statewide mountain snowpack. This table is based on snow pillow (a device for measuring mountain snowpack at automated reporting stations) data.

River Region (SRR), the San Joaquin 4 Rivers (SJR), the Tulare Lake Region (TLR), and the Feather River are shown in Table 8-4. As shown, the water year runoff totals for all of these areas were well below average.

From a water supply perspective, the most closely monitored period is April through July. By the end of July, the April–July runoff was 84, 49, and 45 percent of average, for the three respective regions.

### Water Supply Indices

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were “below normal” and “dry,” respectively, based on observed data for water year 2011–2012.

**Table 8-4 Unimpaired Runoff for Water Year 2011–2012 (million acre-feet)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
SRR runoff	0.57	0.52	0.45	0.81	0.62	2.72	2.85	1.53	0.65	0.44	0.37	0.32	11.84
percent of average	111	59	26	32	25	96	119	68	52	75	89	81	65
SJR runoff	0.15	0.07	0.04	0.14	0.11	0.32	0.85	0.75	0.20	0.06	0.04	0.02	2.76
percent of average	239	53	18	33	24	51	101	53	18	15	36	28	46
TLR runoff	0.12	0.08	0.06	0.09	0.08	0.14	0.37	0.38	0.12	0.06	0.04	0.02	1.55
percent of average	255	120	53	51	41	54	93	52	19	19	37	36	51
Feather River runoff	0.12	0.12	0.08	0.19	0.16	0.68	0.69	0.40	0.15	0.11	0.09	0.06	2.86
percent of average	109	57	22	32	27	95	107	64	46	75	90	71	63
Statewide													
percent of average	131	51	19	39	25	97	128	66	36	45	74	69	62

SRR: Sacramento River Region

Sacramento River above Bend Bridge, Feather River at Oroville, Yuba River near Smartville, American River below Folsom Lake

SJR: San Joaquin 4 Rivers

Stanislaus River below Goodwin Dam, Tuolumne River below La Grange, Merced River below Merced Falls, San Joaquin River below Millerton Lake

TLR: Tulare Lake Region

Kings River below Pine Flat Reservoir, Kaweah River below Terminus Reservoir, Tule River below Lake Success, Kern River below Lake Isabella

WY: Water Year (October 1–September 30)

## Water Year 2012–2013 October through December Water Conditions

The last three months of calendar year 2012 mark the beginning of a new water year, 2012–2013. October was a hot, dry month for California with below average precipitation for the entire State. November was a warm, wet month that finished with a series of atmospheric river events bringing heavy rainfall to the northern part of the State. Lastly, December was a wet month with another series of atmospheric river events pounding the northern part of the State. Precipitation in November and December was above average in the northern part of the State and below average in the southeastern part of the State.

At the end of October, water year runoff totals were 75 percent of average for the Sacramento River Region, 39 percent of average for the San Joaquin 4 Rivers, and 43 percent of average for the Tulare Lake Region. By the end of December, runoff totals for the new water year were 165, 144, and 66 percent of average, respectively, for the same three areas.

## Storage Statewide Storage

Monthly storage totals for the major Sierra reservoirs are shown in Table 8-5. During water year 2011–2012, statewide reservoir storage was at its peak at the beginning of the water year. The water year began at 129 percent of average reservoir storage because of the wet 2010–2011 water year. The percent of average storage decreased through February, rose to a peak of 113 percent of average in April, and then declined to 97 percent of average in August and September. End of water year storage in the major Sierra reservoirs ranged from 151 percent of average in Millerton Reservoir on the San Joaquin River to 47 percent of average in Lake Success on the Tule River and in Lake Isabella on the Kern River.

## State Water Project Storage

The SWP operates a complex system of dams, canals, and reservoirs to collect and store water for future deliveries. Lake Oroville is the first of two primary SWP conservation facilities. Lake Oroville inflow comes from tributaries of the Feather River.

**Table 8-5 Reservoir Storage for Water Year 2011–2012 (thousand acre-feet)**

Reservoir	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta	3,227	3,150	3,095	3,107	3,169	3,853	4,440	4,299	3,881	3,271	2,795	2,592
percent of average	121	116	109	101	95	104	113	110	106	101	97	95
Oroville	2,896	2,807	2,545	2,545	2,520	2,943	3,422	3,500	3,226	2,673	2,230	1,977
percent of average	136	131	117	110	102	109	119	117	112	104	96	90
Folsom	577	481	416	413	387	664	933	926	815	622	503	452
percent of average	116	103	87	81	71	106	128	113	101	90	82	81
San Luis	1,721	1,759	1,928	1,938	1,722	1,764	1,647	1,307	857	678	599	640
percent of average	159	144	139	121	99	96	90	81	66	68	70	67
Pardee	163	172	167	177	167	188	198	195	193	196	192	189
percent of average	94	98	95	99	93	103	108	103	100	103	104	105
New Melones	1,944	1,963	1,975	1,972	1,965	1,982	1,945	1,838	1,735	1,638	1,556	1,511
percent of average	145	145	143	139	134	131	129	121	113	112	112	113
Don Pedro	1,582	1,579	1,576	1,526	1,514	1,523	1,652	1,672	1,577	1,430	1,302	1,224
percent of average	121	120	118	110	105	103	111	108	97	92	91	89
Millerton	280	299	331	317	290	295	370	433	416	323	271	318
percent of average	143	136	122	95	85	81	101	108	100	99	115	151
Pine Flat	556	553	557	584	598	641	744	815	598	314	206	193
percent of average	161	149	136	124	113	114	121	113	87	62	54	57
Kaweah	23	20	14	28	40	65	131	177	128	33	17	13
percent of average	205	155	91	134	164	160	173	147	120	63	88	104
Success	7	11	13	20	26	37	55	65	54	32	8	6
percent of average	83	113	107	116	105	112	125	120	109	93	40	47
Isabella	168	168	167	171	168	171	201	215	170	120	96	88
percent of average	102	108	105	99	91	85	87	72	54	44	45	47
Statewide												
percent of average	129	125	118	111	104	107	113	108	101	98	97	97

The San Luis Reservoir is the second primary SWP conservation facility. This Central California joint-use facility derives its inflow from pumping at the Gianelli Pumping-Generating Plant. San Luis is an off-stream storage reservoir. Most of the water is pumped into the reservoir from late fall to early spring. This water is temporarily stored, then released into the California Aqueduct to meet SWP water contractor peaking demands in the summer months. The remaining SWP dams and reservoirs regulate the stored water supply in delivery patterns that are designed to fit local water demands.

### Water Year 2011–2012 Storage Totals

At the end of the 2011–2012 water year, water storage in major SWP reservoirs and the State's share of joint-use reservoirs was 3.1 million acre-feet (maf) or 56 percent of maximum storage, compared to 4.64 maf or 85 percent of maximum storage at the end of water year 2010–2011. The average end-of-month total storage for the 2011–2012 water year in major SWP reservoirs was 3.56 maf. End-of-water-year storage on September 30, 2012, at Lake Oroville was 1.98 maf, which was about 1.07 maf less than the previous water year. The State's share of San Luis Reservoir storage at the end of the 2011–2012 water year was 389,102 acre-feet (af), compared with 874,062 af in the previous water year. The

combined storage in southern reservoirs was 567,333 af on September 30, 2012, compared with 584,945 af at the end of the 2010–2011 water year.

**Calendar Year 2012 Storage Totals**

The total storage in major SWP reservoirs was about 3.55 maf at the end of 2012, compared with 4.10 maf in 2011. The State’s share of San Luis Reservoir storage was 426,332 af on December 31, 2012, compared with 964,240 af at the same time in 2011. The combined storage in the southern reservoirs was 598,653 af on December 31, 2012, compared with 586,234 af at the same time in 2011.

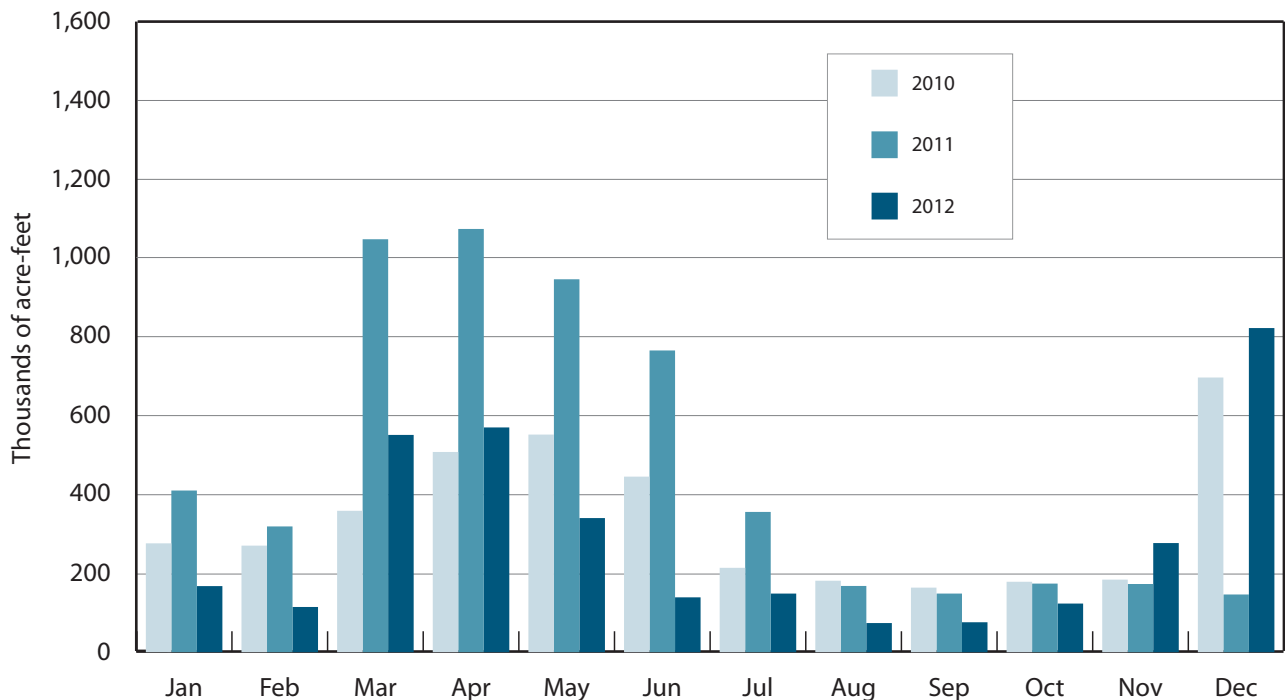
**Lake Oroville**

Lake Oroville has a maximum water storage capacity of 3,537,580 af. Runoff from the upper Feather River drainage, collected and stored in this reservoir, is released to the Sacramento–San Joaquin Delta through

Oroville Dam, Thermalito Diversion Dam, and Thermalito Afterbay.

**Water Year 2011–2012 Inflow.** Lake Oroville inflow for the 2011–2012 water year totaled about 2.60 maf, which was 64 percent of the average (4.05 maf) over the last 30 water years. Maximum daily inflow occurred on March 16, 2012, at 80,040 af. Minimum daily inflow occurred on September 5, 2012, at 492 af. Peak monthly total inflow occurred in April at 564,825 af, 21.7 percent of the water year total. The maximum total in the last 30 water years (1983–2012) was in water year 1982–1983 at 8,853,572 af. The minimum total in the same period was in water year 1991–1992 at 1,555,774 af.

**Calendar Year 2012 Inflow.** Figure 8-2 shows monthly Lake Oroville inflow for calendar years 2010, 2011, and 2012. Total Lake Oroville inflow during the calendar year was 3,332,917 af.



**Figure 8-2 Monthly Inflow into Lake Oroville from the Feather River, 2010–2012 Calendar Years**

Figure 8-3 shows historical (over the last 30 years) maximum and minimum cumulative Lake Oroville inflow for calendar years 1983 and 1994, and current cumulative inflow for 2012.

**Calendar Year 2012 Storage.** Minimum storage occurred on November 16, 2012, at 1,772,690 af, 50 percent of lake capacity. Maximum storage occurred on May 16, 2012, at 3,521,010 af, 100 percent of lake capacity. End-of-year Lake Oroville storage was 2,525,097 af.

Figure 8-4 shows storage in Lake Oroville for the 2011 and 2012 calendar years.

### 2011–2012 Water Year San Luis Reservoir Operations

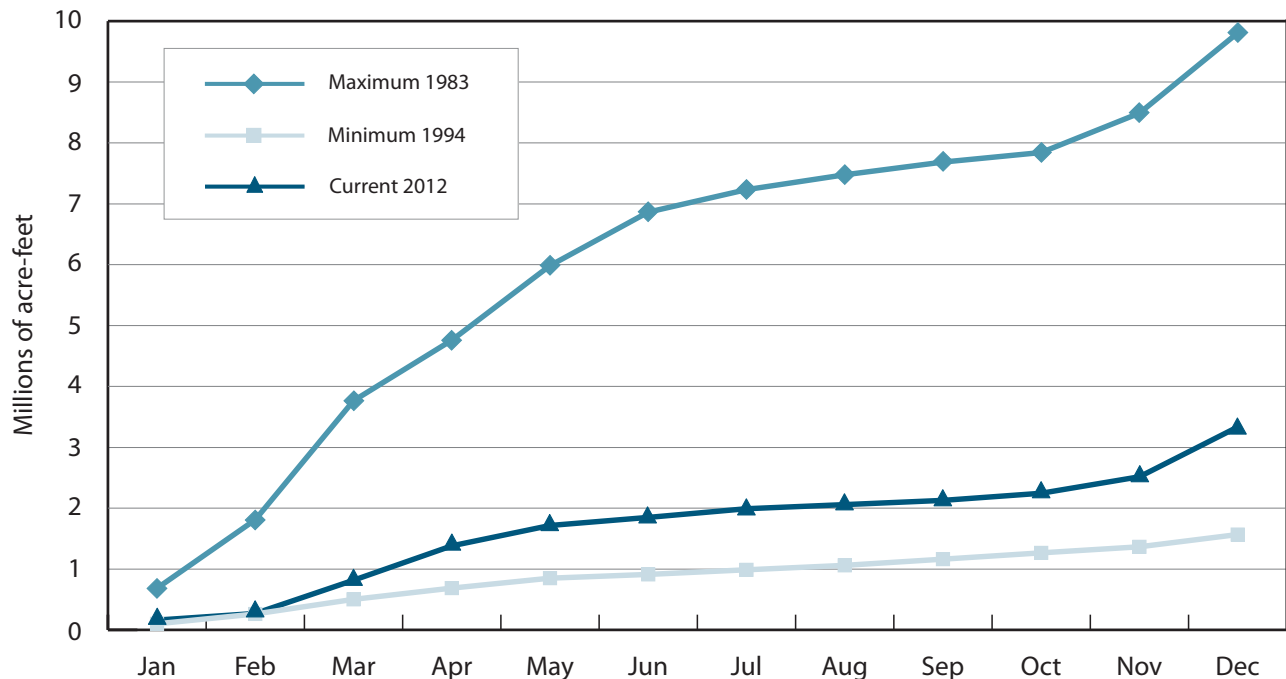
San Luis Reservoir is operated jointly by DWR and the Bureau of Reclamation pursuant to operating procedures adopted in June 1981. San Luis Reservoir has a normal

operating capacity of 2,027,840 af. The SWP share of this capacity is 1,062,183 af.

San Luis Reservoir reached its maximum water year total storage on January 14, 2012, at 1,961,508 af, 97 percent of its normal maximum operating capacity. At the beginning of the water year (September 30, 2011 at midnight), San Luis Reservoir contained 1,516,179 af, 75 percent of its capacity. SWP storage share at the beginning of the water year was 874,062 af. The highest end-of-month SWP share of water storage for the 2011–2012 water year occurred on March 31, 2012, at 1,000,627 af. (See Figure 8-5.)

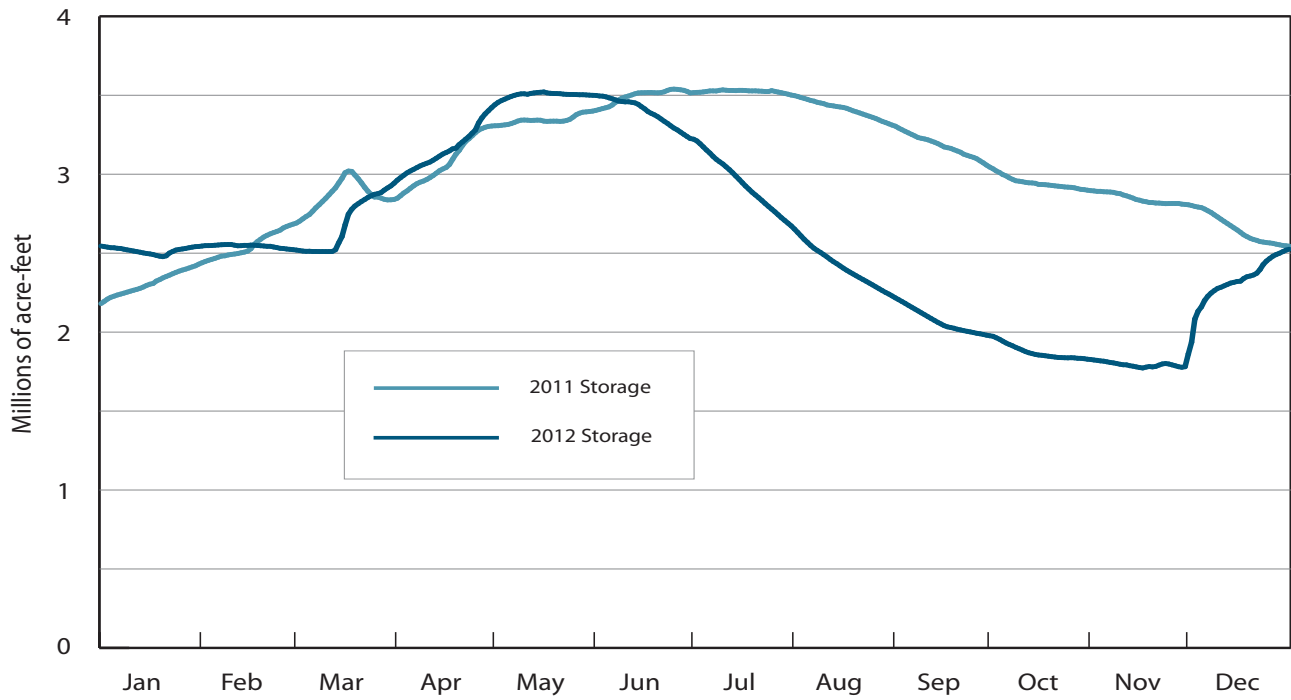
### 2011–2012 Water Year Lake del Valle Operations

Lake del Valle, located off the South Bay Aqueduct, functions primarily as a storage facility for water delivery to Santa Clara and Alameda counties. At the beginning of the water year (September 30 at midnight),

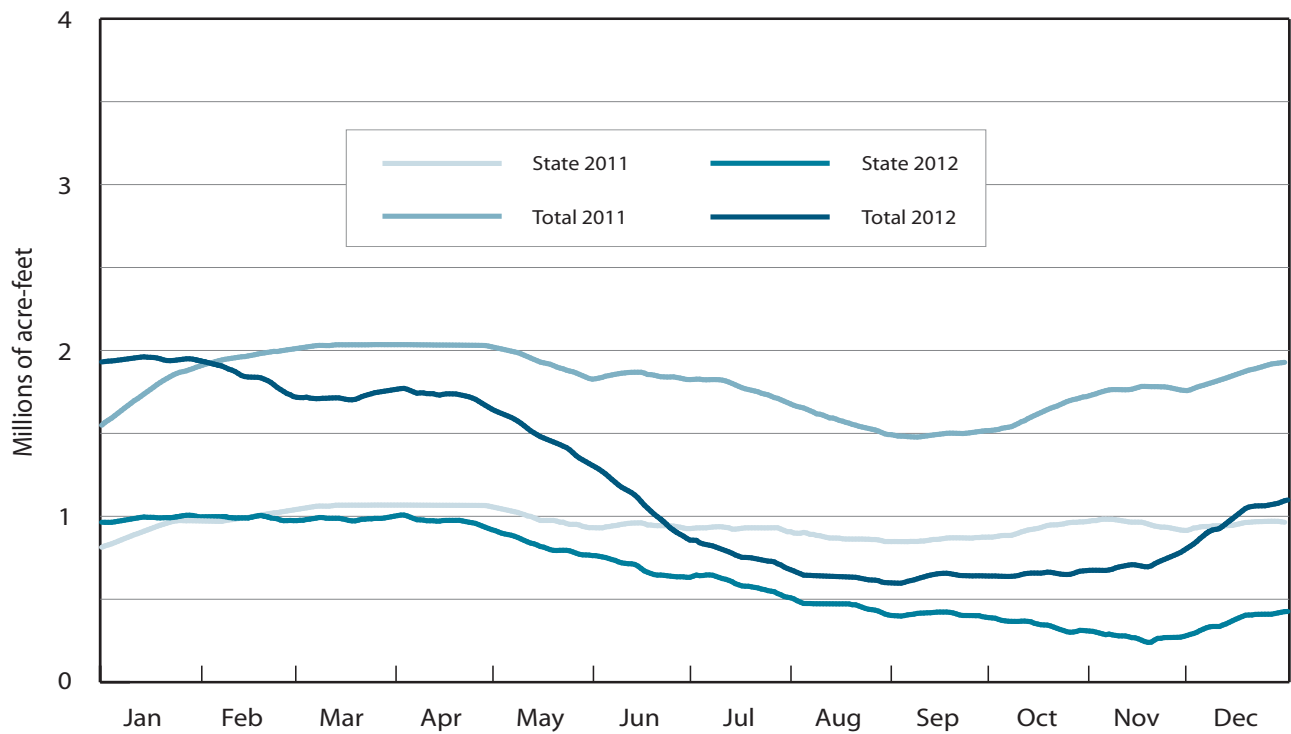


**Figure 8-3 Lake Oroville Cumulative Inflow—Current and Historical (1983–2012 Calendar Years) Maximum and Minimum**





**Figure 8-4** Storage in Lake Oroville, 2011 and 2012 Calendar Years



**Figure 8-5** Storage in San Luis Reservoir, 2011 and 2012 Calendar Years

Lake del Valle held 38,862 af, which was about 50 percent of its maximum capacity of 77,111 af. Its highest storage during the 2011–2012 water year occurred on October 1, 2011 (at midnight), at 38,834 af. Its lowest storage occurred on March 20, 2012, at 28,452 af.

By the end of the water year, on September 30, 2012, storage in Lake del Valle was 37,663 af, 49 percent of its maximum capacity. There was 2,174 af of natural inflow into Lake del Valle, and 11,038 af of inflow from the South Bay Aqueduct. There were no releases to Arroyo Valle, and releases for the water year to the South Bay Aqueduct from Lake del Valle totaled 11,348 af.

### **2011–2012 Water Year Southern Reservoir Operations**

During normal operating conditions, DWR maintains its four southern reservoirs—Pyramid, Castaic, Silverwood, and Perris—at or near full operating capacity to ensure uninterrupted delivery of water to Southern California SWP water contractors.

At the beginning of the water year, these reservoirs held 584,945 af, which is 82 percent of their combined normal maximum operating capacity of 689,021 af. At the end of the water year, the reservoirs held 433,085 af, 63 percent of combined normal maximum operating capacity.

### **Diversions from the Delta**

The SWP diverts water from the Sacramento-San Joaquin Delta, through the Barker Slough and Banks pumping plants, for delivery to SWP water contractors' storage facilities. The SWP diverts water from Barker Slough Pumping Plant to the North Bay Aqueduct. Water is delivered from Banks Pumping Plant to the South Bay Area through the South Bay Aqueduct, and to the San Joaquin Valley, Central Coastal, and Southern California areas through the

California Aqueduct. The Central Valley Project (CVP) diverts water to similar areas from the Delta through Jones Pumping Plant and Contra Costa Pumping Plant.

In calendar year 2012, the North Bay Aqueduct received 39,818 af of water from the Barker Slough Pumping Plant.

In 2012, the SWP diverted 2,307,621 af at Banks Pumping Plant. There was 31,926 af of Cross Valley Canal water and 29,696 af of CVP water wheeled at Banks Pumping Plant by DWR during calendar year 2012. Figure 8-6 shows the amounts of water pumped each month in 2012 at Banks Pumping Plant.

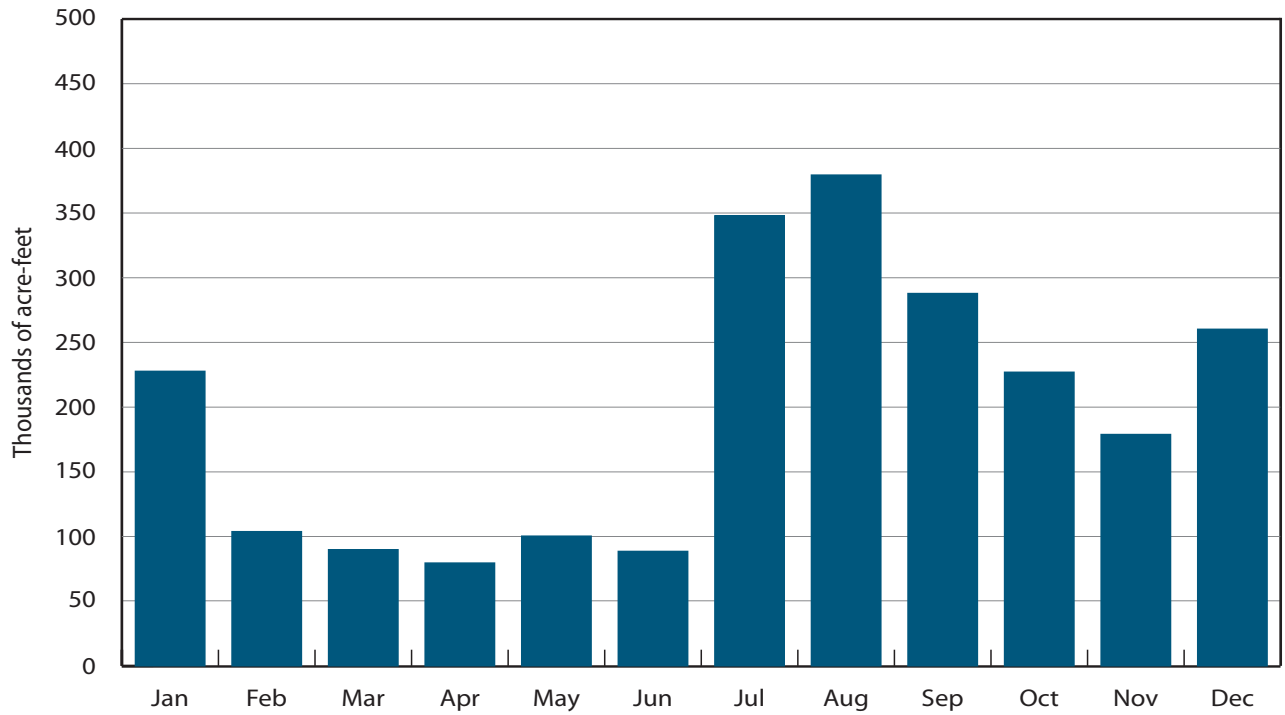
The CVP diverted 2,048,891 af at Jones Pumping Plant and 150,663 af at Contra Costa Pumping Plant.

The combined Delta exports include all of these plants. Figure 8-7 shows the monthly amounts of water diverted from the Delta in 2012 by the SWP and CVP. Maximum daily Delta exports occurred on August 7, 2012, at 23,984 af. Combined SWP and CVP monthly Delta exports in 2012 varied from a low of 135,213 af in April, to a high of 672,341 af in August. In 2012, Delta exports totaled approximately 4.6 maf.

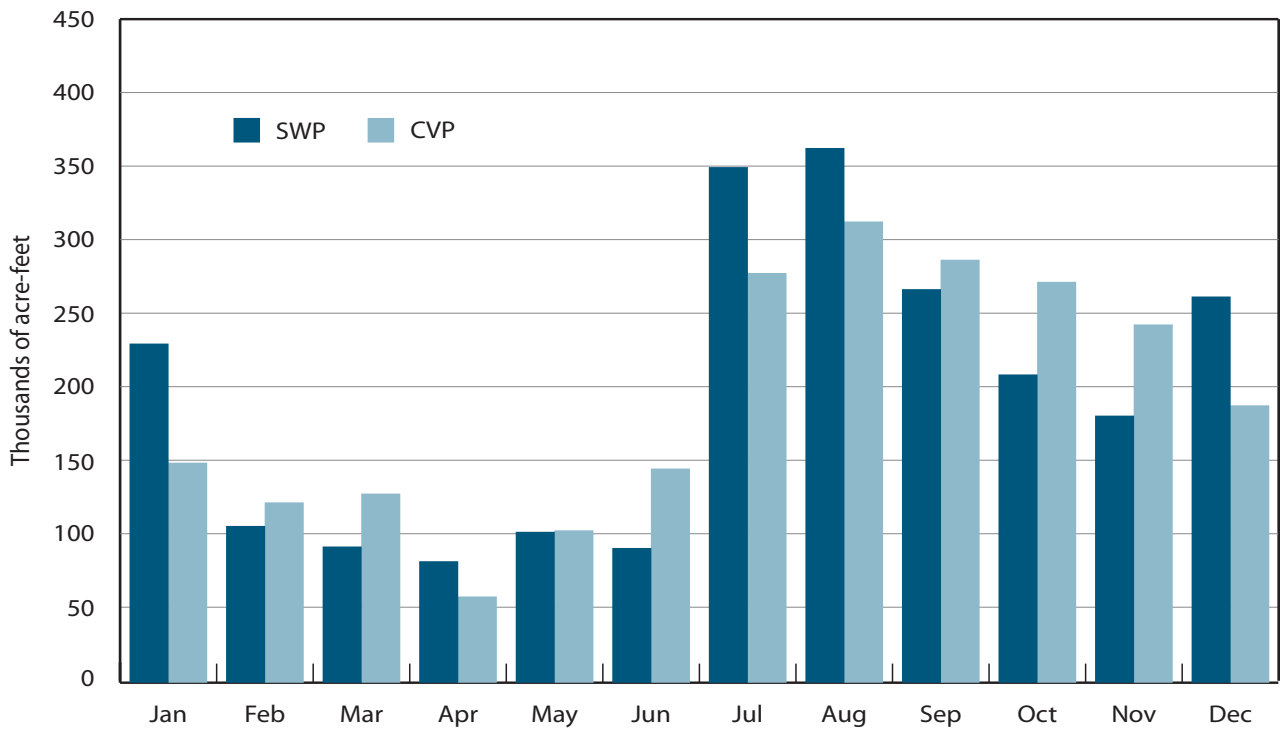
Dos Amigos Pumping Plant diverts water from O'Neill Forebay to the California Aqueduct. Figure 8-8 shows monthly total amounts pumped at Dos Amigos Pumping Plant for calendar year 2012. Dos Amigos pumped the largest amount in July 2012 at 531,298 af.

In 2012, water pumped through the Edmonston Pumping Plant for delivery to Southern California totaled 1,570,507 af. Figure 8-9 shows the amount of water pumped each month in calendar year 2012.

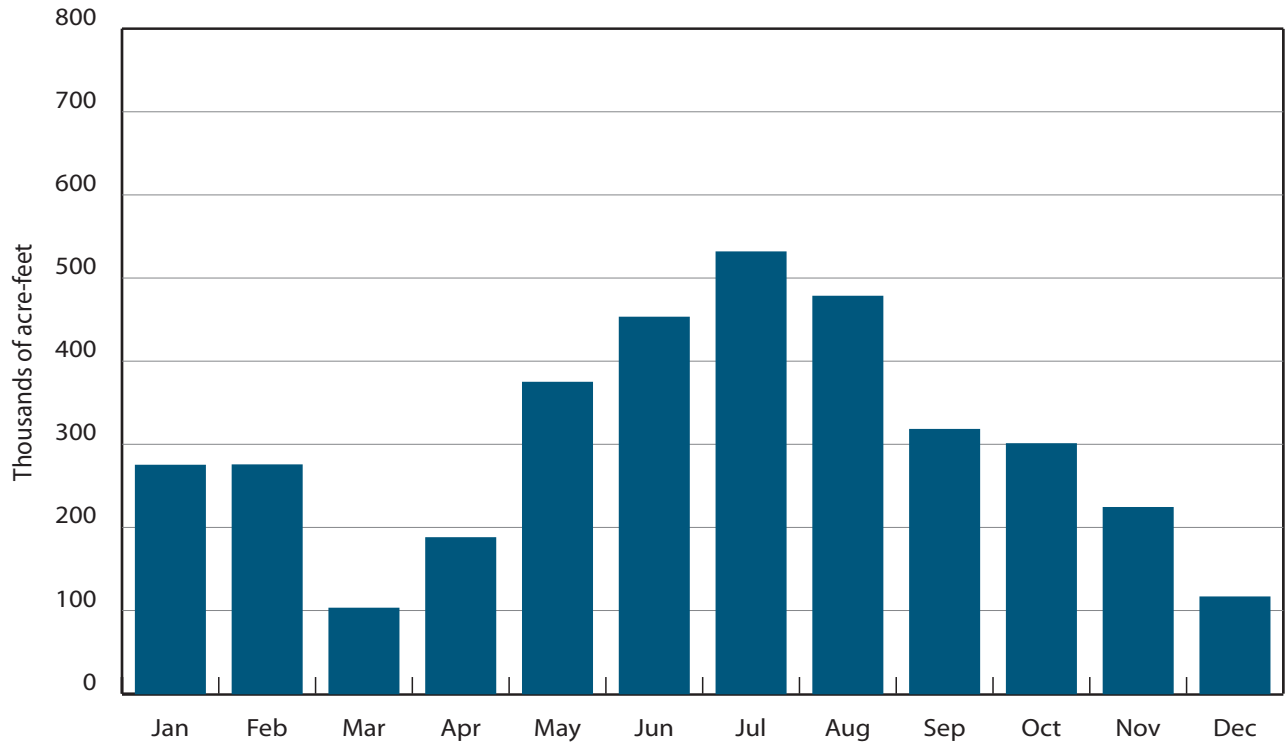
Additional water supply information can be found on DWR's website.



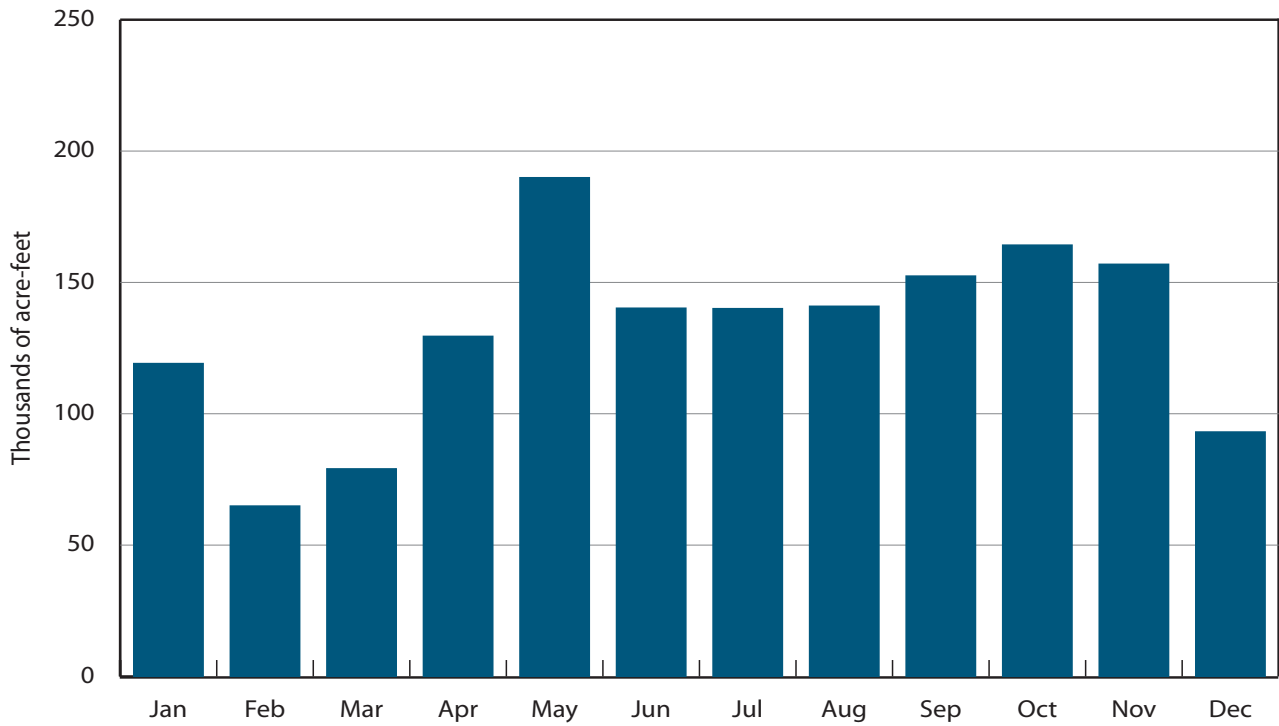
**Figure 8-6** Water Pumped at Banks Pumping Plant, 2012 Calendar Year



**Figure 8-7** Sacramento-San Joaquin Delta Exports by State Water Project and Central Valley Project, 2012 Calendar Year



**Figure 8-8** Water Pumped at Dos Amigos Pumping Plant, 2012 Calendar Year



**Figure 8-9** Water Pumped at Edmonston Pumping Plant, 2012 Calendar Year







## **Chapter 9**

# **Water Contracts and Deliveries**

*Pearblossom Pumping Plant.*

## Significant Events in 2012

In 2012, a total of 3,967,453 acre-feet (af) of State Water Project (SWP) and non-SWP water was delivered to 29 long-term SWP water contractors and 21 other agencies. The portion delivered to SWP water contractors was 2,836,231 af; the portion to non-SWP agencies was 1,131,222 af.

The hydrologic conditions in the Sacramento River watershed were classified as below normal, and classified as dry in the San Joaquin River watershed. As a result, DWR approved only 65 percent of the SWP contractors' Table A allocation requests.

Five SWP contractors stored approximately 220,000 af of water in various groundwater banking programs, and three contractors recovered approximately 35,000 af of water from storage in 2012.

In 2012, the Department of Water Resources (DWR) and the Bureau of Reclamation (Reclamation) signed an agreement to share, equally, Component 1 water made available pursuant to the Lower Yuba River Accord (Yuba Accord) from 2012 through 2015. DWR also executed Amendment 4 to the Yuba Accord, providing from 2012 through 2015 annual negotiations of the price for groundwater substitution water, the Delta export priority among contractors' transfer supplies, and the possible suspension of certain accounting rules to permit all groundwater substitution water to be classified as Component 4. No groundwater substitution water was provided in 2012.

In 2012, two SWP contractors requested DWR to convey 67,079 af of water purchased from Biggs-West Gridley Water District (WD), Butte WD, Richvale Irrigation District, and Western Canal WD for delivery to their service areas. Due to operational constraints at Oroville Dam, DWR was unable to release the transfer water during the 2012 transfer window between July and September. This water was stored in Lake Oroville and is expected to be released during the transfer window in 2013.

*Information for this chapter was provided by the State Water Project Analysis Office.*

The long-term water supply contracts between the Department of Water Resources (DWR) and 29 public agencies and local water districts provide for water service from the State Water Project (SWP) and are the basis for the SWP's construction and on-going operations. The State provides SWP financing, capital construction, improvements, and all operations and maintenance of SWP facilities, and the agencies and local districts have contractually agreed to repay all associated costs.

The water supply contracts also set forth the maximum amount of water a contractor may request each year from the SWP, and these water amounts are written within the contracts in a list format known as Table A. "Table A" or "Table A water" represents a portion or all of the annual Table A requested by SWP water contractors and approved for delivery by DWR based on hydrologic conditions, current reservoir storage, and combined requests from the SWP water contractors. Under certain conditions, DWR is not able to deliver the quantity of water requested by contractors. In these years, a proportional amount is allocated and delivered according to the long-term water supply contracts by prorating the amount in proportion to each SWP water contractor's maximum Table A amount. Table A amounts may also be used as a factor to allocate other available water supplies to each contractor. Approved Table A amounts may also be referred to in this chapter as "approved amounts," "approved water," or "allocated water."

The long-term water supply contracts are amended as needed.

DWR also enters into agreements with SWP water contractors and other agencies, which may be amended periodically, to convey SWP and non-SWP water through the California Aqueduct and to approve the construction, operation, and maintenance of SWP facilities and turnouts/turn-ins. These agreements are also listed in this chapter.

The State Water Project Analysis Office (SWPAO) developed a numbering system for contracts, amendments, and agreements executed by DWR. These numbers, referred to as SWPAO numbers, are designated in Chapter 9 text as "SWPAO #XXXXX" and are located in parentheses after each contract, amendment, or agreement description. These numbers can be used as an identifier for anyone who contacts DWR staff for more detailed information on a particular document.

## Amendments to Long-term SWP Water Supply Contracts

All the original long-term water supply contracts signed by DWR, public agencies, and local water districts have been previously amended to incorporate mutually desired changes. Most amendments fall under the following general categories:

- (1) permanent transfers of Table A amounts from one SWP water contractor to another;
- (2) allocation of costs and benefits for the addition or enlargement of SWP facilities;
- (3) purchase of excess capacity in the California Aqueduct; and
- (4) provisions to implement Monterey Agreement principles.

## State Water Project Long-term Water Supply Contracts

The first water supply contract was signed with The Metropolitan Water District of Southern California (Metropolitan) on November 4, 1960. The contract was negotiated by the Department of Water Resources (DWR) and Metropolitan according to terms of the contracting principles for water service contracts announced by the Governor on January 20, 1960.

The Metropolitan contract became the prototype for all water contracts; by the end of 1967, 31 agencies had contracted for water. In addition, a water supply contract was executed with the City of West Covina in December 1963, but it was terminated in August 1965; the city's Table A amount was transferred to Metropolitan through an amendment to the district's long-term contract with DWR. Long-term contracts with Hacienda Water District and Devil's Den Water District were also terminated when those districts transferred their Table A amounts, through contract amendments, to Tulare Lake Basin Water Storage District (1981) and Castaic Lake Water Agency (1992), respectively. Today the State Water Project (SWP) has long-term water supply contracts with 29 agencies. Those contracts have been amended periodically to incorporate mutually agreed upon modifications.

All water contracts signed in the 1960s included an estimate of the date water would first be delivered and a schedule of the amount of water the agency could expect to be delivered annually (annual Table A amounts). That amount was designed to increase gradually until the maximum amount of annual Table A was reached. The total combined maximum annual Table A amount for all water contracting agencies was initially 4,230,000 acre-feet (af), assuming full development of the SWP.

The contracts were initially designed to be valid for 75 years or until all bonds sold as part of the California Water Resources Development Bond Act were repaid, whichever period was longer. As a result of amendments to contracts in the 1990s, the current combined maximum annual Table A amount totals 4,172,786 af, and the contracts are in effect for the longest of the following periods: (1) the project repayment period, which extends to 2035; (2) 75 years from the date of the contract; or (3) the period ending with the latest maturity date of any bond used to finance the construction costs of project facilities.

### 2012 Amendments to Long-term Water Supply Contracts

There were no amendments to the long-term water supply contracts in 2012.

### Monterey Amendments

The Monterey Amendments increase the reliability of existing water supplies, and increase water management flexibility,

providing more tools for local water agencies to maximize use of existing facilities.

The Monterey Amendments include changes in allocation of Table A water, the transfer of Table A amounts and land, financial restructuring, and increased operational flexibility. The Monterey Amendments are discussed in detail in Chapter 1, Summary of Significant Events, Bulletin 132-95, found on the DWR website.



Plumas County Flood Control and Water Conservation District (Plumas) and Empire West Side Irrigation District (Empire) remain the only long-term SWP water contractors who have not signed the Monterey Amendments.

In accordance with the terms of the May 5, 2003, Monterey Settlement Agreement, the SWP continues to operate pursuant to the Monterey Amendments while the new environmental impact report (EIR) is being prepared. The draft EIR was released in October 2007 and is available on DWR's website. The final EIR was released in February 2010, and a notice of determination to proceed with the project was filed in June 2010. DWR's decision was to continue to operate the SWP under the existing Monterey Amendments pursuant to the SWP long-term water supply contracts, including the Kern Water Bank transfer, and under the settlement agreement entered in the *Planning and Conservation League v. DWR* lawsuit. DWR's decision was challenged by two groups of plaintiffs on issues relating to the adequacy of the EIR and the validity of the Monterey Amendments. The cases are currently being heard by the trial court. Final resolution of the issues is likely to take a number of years.

The settlement agreement is discussed in detail in Bulletin 132-04, Chapter 9, Water Contracts and Deliveries, (available on DWR's website).

See Chapter 6, Legislation and Litigation, for the current status of the Monterey Amendment litigation.

## Miscellaneous Agreements with Long-term SWP Water Contractors

### 2012 Water Conveyance and Exchange Agreements

Water conveyance and exchange agreements that were executed or pending execution with long-term SWP water contractors during 2012 are described below.

#### *Alameda County Flood Control and Water Conservation District, Zone 7*

An amendment executed March 16, 2012, extended the term of the 2002 point of delivery agreement among DWR, Kern County Water Agency (Kern), and Alameda County Flood Control and Water Conservation District, Zone 7 (Alameda-Zone 7). The agreement (SWPAO #02010) provided for a portion of Alameda-Zone 7's SWP supplies to be stored in the Semitropic Groundwater Banking and Exchange Program and for the future return of such water. This amendment extended the term for the water to be returned to Alameda-Zone 7 to December 31, 2035. No water was delivered under this amendment in 2012. (SWPAO #02010-A)

#### *Antelope Valley-East Kern Water Agency*

A letter agreement among DWR, Antelope Valley-East Kern Water Agency (AVEK) and Kern, dated September 13, 2012, and executed September 24, 2012, approved the transfer of up to 35,000 acre-feet (af) of AVEK's 2012 Table A water to Kern on behalf of WDS California II, LLC, that farms in both AVEK's and Kern's service areas. During 2012, a total of 33,511 af of AVEK's Table A water was delivered to Kern. (SWPAO #12021)

#### *County of Butte*

Three agreements were executed in 2012 among DWR, County of Butte (Butte), and



several participating SWP contractors. These agreements were the result of Butte's low in-county demands in 2012 and anticipated demands in 2013. The long-term water supply contract for Butte provides for a maximum Table A amount of 27,500 af per year. Butte determined that up to 24,000 af per year of its Table A amount is not needed to meet its in-county demands for 2012 and 2013 and requested a transfer of up to 24,000 af per year of water to the participating SWP contractors. Also, Butte determined that the difference of 3,500 af per year (27,500 af-24,000 af) may not be fully utilized by Butte for its in-county needs and requested a transfer of a portion of the 3,500 af on a percentage basis to the participating SWP contractors (Additional Water). In 2012, Butte requested, and DWR approved, three transfer agreements as described below:

(1) An agreement among DWR, Butte, and Palmdale Water District (Palmdale), executed August 3, 2012, approved the delivery of up to 10,000 af of Butte's approved Table A water plus a portion of Butte's Additional Water if it becomes available to Palmdale for its service area in 2012 and 2013. During 2012, a total of 6,861 af of Butte's water was delivered to Palmdale. (SWPAO #12015)

(2) An agreement among DWR, Butte, and Dudley Ridge Water District (Dudley Ridge), executed August 3, 2012, approved the delivery of 14.34 percent of the water derived from the 14,000 af of Butte's approved Table A water plus a portion of Butte's Additional Water, if it becomes available, to Dudley Ridge in 2012 and 2013. During 2012, a total of 1,382 af of Butte's water was delivered to Dudley Ridge. (SWPAO #12016)

(3) An agreement among DWR, Butte, and Kern, executed August 3, 2012, approved the delivery of 85.66 percent of the water derived from the 14,000 af of Butte's approved Table A water plus a portion of Butte's Additional Water if it becomes available to

Kern for four of its member units (Belridge Water Storage District, Berrenda Mesa Water Storage District, Lost Hills Water District, and Wheeler Ridge-Maricopa Water Storage District [Wheeler Ridge-Maricopa]) in 2012 and 2013. During 2012, a total of 8,258 af of Butte's water was delivered to Kern. (SWPAO #12017)

### ***Castaic Lake Water Agency***

A letter agreement among DWR, Kern, and Castaic Lake Water Agency (Castaic Lake), dated August 10, 2012, and executed October 9, 2012, approved the exchange of up to 5,500 af of Castaic Lake's approved 2012 SWP supplies for an equal amount of its non-project water currently stored in Kern's Rosedale-Rio Bravo Banking and Recovery Program to facilitate access to Castaic Lake's non-project water by the Kern Westside Districts. During 2012, 5,500 af was delivered to Castaic Lake. (SWPAO #12019)

An amendment dated June 20, 2012, and executed July 26, 2012, extended the term of an agreement among DWR, Castaic Lake, and Kern. The agreement (SWPAO #11010) provided for the delivery of up to 19,000 af of Castaic Lake's approved SWP supplies to Kern before December 31, 2011, in exchange for the return of Kern's future SWP supplies equal to 50 percent of the total amount delivered to Kern. This amendment extended the term for the delivery of Castaic Lake's SWP supplies to December 31, 2012. During 2012, a total of 3,584 af of Castaic Lake's Table A water was delivered to Kern. (SWPAO #11010-A)

A letter agreement among DWR, Castaic Lake, and Kern, dated October 24, 2011, and executed January 23, 2012, approved the transfer of up to 5,000 af of Castaic Lake's Table A water to Kern. In return, Kern will provide 50 percent of the water, up to 2,500 af, of its future Table A to Castaic Lake. During 2012, no water was delivered to Kern under this agreement. (SWPAO #11016)

### ***Coachella Valley Water District***

An amendment, executed July 31, 2012, extended the term to an agreement among DWR, Coachella Valley Water District (Coachella), and Kern. The agreement (SWPAO #07022) provided for the a change in point of delivery and conveyance of up to 10,000 af of non-project water under Article 55 of Coachella's long-term water supply contract thru December 31, 2010. This amendment extended the term to December 31, 2012. During 2012, a total of 4,000 af was delivered to Coachella. (SWPAO #07022-A)

### ***Dudley Ridge Water District***

A letter agreement between DWR and Dudley Ridge, dated July 13, 2012, and executed July 18, 2012, approved the conveyance of up to 3,100 af of non-project water, minus 30 percent Delta carriage water losses, from Browns Valley Irrigation District under Article 55 of Dudley Ridge's long-term water supply contract through December 31, 2012. During 2012, a total of 2,170 af was delivered to Dudley Ridge under this agreement. (SWPAO #12013)

A multiyear exchange agreement among DWR, Dudley Ridge, and Tulare Lake Basin Water Storage District (Tulare), executed September 7, 2012, approved multiyear water exchanges and same landowner transfers between Dudley Ridge and Tulare through December 31, 2035. This agreement approved the delivery of up to 15,000 af per year for the years 2012–2035 of Dudley Ridge's and/or Tulare's approved Table A water for same landowner transfer to the other party without any expected return. During 2012, no water was moved under this agreement. (SWPAO #12011)

A change in point of delivery agreement among DWR, County of Kings (Kings), and Dudley Ridge, executed August 7, 2012, approved the delivery of up to 7,500 af of Dudley Ridge's SWP supplies from Reach 8D of the California Aqueduct

to Kings' service area in Reach 31A. During 2012, no water was moved under this agreement. (SWPAO #12002)

### ***Empire West Side Irrigation District***

A contract between DWR and Empire, executed January 6, 2012, approved the delivery of unscheduled water to Empire in 2012 at times when SWP water is not needed for fulfilling Table A deliveries or for meeting project operational commitments. No unscheduled water was available for delivery to Empire during 2012. (SWPAO #12001)

### ***Kern County Water Agency***

A letter agreement between DWR and Kern, dated July 9, 2012, and executed July 18, 2012, approved the conveyance of up to 55,300 af of Kern-Tulare's (Kern-Tulare) 2012 and 2013 Central Valley Project (CVP) water under Article 55 of Kern's long-term water supply contract. In exchange, Kern-Tulare will receive an equal amount of Kern's Table A water. During 2012, a total of 20,320 af was delivered to Kern under this agreement. (SWPAO #12010)

A letter agreement between DWR and Kern, dated October 9, 2012, and executed October 31, 2012, provided for the conveyance of up to 3,086 af of Friant Recirculation Water associated with the San Joaquin River Restoration Program to Kern. Wheeler Ridge-Maricopa, a member unit of Kern, purchased this non-project water from the Friant Division CVP contractors to increase its future in-district supplies. The Bureau of Reclamation (Reclamation) made this non-project water available at O'Neill Forebay for DWR to convey to Kern under Article 55 of Kern's long-term water supply contract. During 2012, a total of 3,086 af of water was delivered to Kern under this agreement. (SWPAO #12022)

A letter agreement between DWR and Kern, executed January 17, 2012, provided for the conveyance of up to 12,000 af of CVP water to Kern. The non-project water was

purchased by Rosedale-Rio Bravo Water Storage District (Rosedale-Rio), a member unit of Kern, from San Luis Water District to increase its future in-district supplies. Reclamation made this non-project water available at O'Neill Forebay for DWR to convey to Kern under Article 55 of Kern's long-term water supply contract. During 2012, a total of 12,000 af of water was delivered to Kern under this agreement. (SWPAO #12008)

### ***The Metropolitan Water District of Southern California***

A change in point of delivery agreement among DWR, The Metropolitan Water District of Southern California (Metropolitan), and Kern, executed August 3, 2012, provided for the delivery of a combined total of up to 6,500 af of Metropolitan's approved SWP supplies to storage and for future return to Metropolitan. The water is to be stored in Irvine Ranch Water District's (Irvine Ranch) Strand Ranch Integrated Banking Project (Strand Ranch), located in Kern County and operated by Rosedale-Rio. Irvine Ranch receives SWP supplies from Municipal Water District of Orange County, a member agency of Metropolitan. (SWPAO #11022)

Two related agreements were executed in 2012 to facilitate the water acquired by Irvine Ranch for subsequent storage in Strand Ranch. An agreement among DWR, Kern, Metropolitan, and Santa Barbara County Flood Control and Water Conservation District (Santa Barbara), dated April 18, 2012, and executed June 28, 2012, approved delivery of up to 1,500 af of Santa Barbara's approved SWP supplies to Strand Ranch by December 31, 2012. In exchange, Metropolitan's future SWP supplies will be returned to Santa Barbara based on an unbalanced exchange (2 for 1, less losses) by December 31, 2017. (SWPAO #11021)

Additionally, an agreement among DWR, Kern, Metropolitan, and AVEK, dated April 18, 2012, and executed June 28, 2012,

approved delivery of up to 5,000 af of AVEK's approved SWP supplies to Strand Ranch by December 31, 2012. In exchange, Metropolitan's future SWP supplies will be returned to AVEK based on an unbalanced exchange (2 for 1, less losses) by December 31, 2017. (SWPAO #11023)

During 2012, a total of 6,400 af was delivered to Kern's turnout, of which 1,400 af was Santa Barbara's Table A water and 5,000 af was AVEK's Table A water. (SWPAO #11021, #11022, #11023)

### ***Mojave Water Agency***

An amendment executed January 12, 2012, increased the term and amount of water delivery to the 1997 change in point of delivery agreement among DWR, Mojave Water Agency (Mojave), and AVEK. The 1997 agreement (SWPAO #97003) approved the delivery of up to 2,250 af of Mojave's approved SWP Table A water to AVEK's turnouts through December 31, 2019, for subsequent delivery to the solar power generating plant operated by Luz Solar Partners, Ltd., III-VII. This plant is located within Mojave's boundaries, but is not located near any of Mojave's delivery facilities. The amendment increased the amount, up to 4,800 af per year, of Mojave's approved Table A water delivery to AVEK's turnouts, and extended the term of water delivery to December 31, 2035. The increase will provide for the delivery of up to 1,800 af annually for use by the solar power generating plant and provide for the delivery of up to 3,000 af in AVEK's groundwater basin as a backup water supply to the plant in the event of an outage on the SWP. During 2012, 1,306 af was moved under this agreement. (SWPAO #97003-A)

### ***Palmdale Water District***

A letter agreement among DWR, Palmdale, and AVEK, dated May 1, 2012, and executed November 13, 2012, provided for the delivery of up to 10,000 af of Palmdale's 2011 SWP supplies to AVEK. In exchange,



AVEK will return 50 percent of the total amount delivered to AVEK, up to 5,000 af, of its future SWP supplies to Palmdale by December 31, 2021. During 2012, a total of 2,659 af of Palmdale's Article 56(c) carryover water was delivered to AVEK. (SWPAO #11020)

### ***San Bernardino Valley Municipal Water District***

A change in point of delivery agreement among DWR, Kern, and San Bernardino Valley Municipal Water District (San Bernardino), executed April 13, 2012, provided for the delivery of up to 30,000 af of San Bernardino's 2011 Table A water to Kern for storage in the groundwater basin underlying Kern Delta Water District, a member unit of Kern, and for the return delivery of up to 5,000 af per year of stored water to San Bernardino. The stored water will be returned to San Bernardino by December 31, 2035. During 2012, a total of 21,934 af, or 19,522 af with losses, of San Bernardino's Table A water was delivered to Kern under this agreement. (SWPAO #11015)

### ***Santa Barbara County Flood Control and Water Conservation District***

A letter agreement among DWR, Santa Barbara, and Kern, dated November 10, 2011, and executed January 16, 2012, approved the delivery of up to 17,000 af of Santa Barbara's 2011 SWP supplies to Kern, in exchange for the return of Kern's future approved SWP supplies equal to two-thirds, less losses, of the total amount delivered to Kern (SWPAO #11018). An amendment to SWPAO #11018, dated June 18, 2012, and executed August 2, 2012, updated Santa Barbara's charge provisions. During 2012, no water was moved. (SWPAO #11018 and #11018-A)

An amendment dated April 6, 2012, and executed April 16, 2012, approved water delivery to an additional reach in the letter agreement among DWR, Santa

Barbara, and Dudley Ridge. The agreement (SWPAO #11019) approved the delivery of up to 3,000 af of Santa Barbara's 2011 SWP supplies to Dudley Ridge to be subsequently delivered to Kern in Reaches 12E and 13B of the California Aqueduct for storage under a 2008 agreement among DWR, Dudley Ridge, and Kern (SWPAO #08050). The amendment provides for an additional point of delivery to Dudley Ridge's turnouts in Reach 8D. The return of Dudley Ridge's water to Santa Barbara will be completed by December 31, 2021. During 2012, a total of 43 af of Santa Barbara's water was provided to Dudley Ridge. (SWPAO #11019-A)

### ***Tulare Lake Basin Water Storage District***

A letter agreement among DWR, Tulare, and Westlands Water District (Westlands), dated March 27, 2012, and executed April 5, 2012, approved the transfer of up to 4,000 af of Tulare's 2012 Table A water to Westlands on behalf of Westlake Farms Inc., that farms in both Tulare's and Westlands' service areas. During 2012, no water was delivered under this agreement. (SWPAO #12003)

A letter agreement among DWR, Tulare, and Kern, dated March 8, 2012, and executed May 25, 2012, approved the transfer of up to 2,000 af of Tulare's 2012 Table A water to Kern. The transfer was made on behalf of landowner, Sandridge Partners Incorporated, that farms in both Tulare's and Kern's service areas. During 2012, a total of 2,000 af of Tulare's Table A water was delivered to Kern. (SWPAO #12004)

A letter agreement among DWR, Tulare, and Dudley Ridge, dated March 8, 2012, and executed March 12, 2012, approved the transfer of up to 10,000 af of Tulare's 2012 Table A water to Dudley Ridge. The transfer was made on behalf of landowner, Sandridge Partners Incorporated, that farms in both Tulare's and Dudley Ridge's service areas. During 2012, a total of 2,800 af of Tulare's Table A water was delivered to Dudley Ridge. (SWPAO #12005)

A letter agreement among DWR, Tulare, and Kern, dated March 8, 2012, and executed May 3, 2012, approved the transfer of up to 10,000 af of Tulare's 2012 Table A water to Kern. The transfer was made on behalf of landowner, J.G. Boswell Company, that farms in both Tulare's and Kern's service areas. During 2012, a total of 8,000 af of Tulare's Table A water was delivered to Kern. (SWPAO #12006)

A letter agreement between DWR and Tulare, dated May 2, 2012, and executed May 14, 2012, approved the conveyance of up to 30,000 af of Friant Recirculation Water in association with the San Joaquin River Restoration Program to Tulare. This non-project water was made available by Lower Tule River Irrigation District, Tulare Irrigation District, and Fresno Irrigation District to Tulare in exchange for a comparable amount of Tulare's local river supplies. Reclamation made this non-project water available at O'Neill Forebay for DWR to convey to Tulare under Article 55 of Tulare's long-term water supply contract. In 2012, a total of 8,300 af was delivered to Tulare under this agreement. (SWPAO #12009)

A letter agreement between DWR and Tulare, dated July 30, 2012, and executed July 31, 2012, approved the conveyance of up to 5,300 af of non-project water delivered under Article 55 of Tulare's long-term water supply contract. The water was made available by Fresno Slough Water District (4,000 af) and Mercy Springs Water District (1,300 af) for delivery to Angiola Water District, a member unit of Tulare. During 2012, a total of 1,066 af was delivered to Tulare under this agreement. (SWPAO #12020)

An amendment dated March 8, 2012, and executed March 9, 2012, extended the term of the letter agreement between DWR and Tulare. The agreement (SWPAO #11014) approved the conveyance of up to 30,000 af of Friant Recirculation Water in association with the San Joaquin River Restoration Program to Tulare through February 29,

2012. This amendment extended the term to March 31, 2012. No water was moved under this amendment in 2012. (SWPAO #11014-A)

## **Water Conveyance and Exchange Agreements Prior to 2012**

### ***County of Kings***

A long-term change in point of delivery agreement among DWR, Kings, and Tulare, executed March 10, 2006, provided for the delivery of up to 200 af of Kings' annual Table A water to Westlands' turnouts. The water was conveyed to GWF Energy LLC, for use within Kings' service area. This agreement is effective through December 31, 2035. During 2012, 8 af of Article 56(c) carryover water was delivered to Westlands' turnouts. (SWPAO #02031)

A long-term change in point of delivery agreement among DWR, Kings, and Westlands, executed March 24, 2004, provided for the delivery of up to 5,000 af of Kings' annual Table A water through Westlands' turnouts for use at Lemoore Naval Air Station. During 2012, DWR delivered a total of 3,662 af to Westlands' turnouts, which included 1,993 af of Article 56(c) carryover water and 1,669 af of Table A water. (SWPAO #04005)

A long-term change in point of delivery agreement among DWR, Kings, and Westlands, executed May 6, 2008, provided for Kings' approved SWP supplies to be conveyed to specific Westlands' turnouts in the California Aqueduct. Kings requested the water for use on Westlands' agricultural lands within Kings' service area. This agreement is effective through December 31, 2035. During 2012, DWR conveyed a total of 1,011 af to Westland's turnouts, of which 11 af was Turn-Back Pool A water and 1,000 af was Table A water. (SWPAO #07010)

### ***Dudley Ridge Water District***

A multiyear same landowner transfer agreement among DWR, Dudley Ridge, and Kern, executed June 13, 2011, provided for



the delivery of a portion of Dudley Ridge's approved Table A water for same landowner transfers to Kern without any expected return through December 31, 2020. During 2012, a total of 7,260 af of Dudley Ridge's Table A water was delivered to Kern. (SWPAO #10030)

A multiyear exchange agreement among DWR, Dudley Ridge, and San Gabriel Valley Municipal Water District (San Gabriel), executed September 14, 2010, approved the conveyance of Dudley Ridge's approved SWP supplies to San Gabriel effective January 1, 2010, through December 31, 2020. San Gabriel will provide for the return of its approved SWP water in future years through December 31, 2030. Terms and conditions of this agreement also covered Table A water provided for conveyance to San Gabriel during 2008 from Dudley Ridge. During 2012, a total of 3,338 af of Dudley Ridge's Table A water was conveyed to San Gabriel. (SWPAO #10013)

### ***Empire West Side Irrigation District***

A long-term change in place of use agreement among DWR, Empire, and Westlands, executed March 3, 2011, approved annual delivery of up to 2,000 af of Empire's Table A water to Westlands through April 1, 2027. This transfer was made on behalf of two landowners, Brooks Farms and Newton Brothers, that farm in both Empire's and Westlands' service areas. DWR petitioned the State Water Resources Control Board (SWRCB) for a temporary change in place of use. The SWRCB issued an order authorizing the long-term change in place of use on November 21, 2011. During 2012, 963 af was delivered to Westlands. (SWPAO #10008)

### ***Kern County Water Agency***

A multiyear conveyance agreement among DWR, Kern, and the City of Tracy (Tracy), executed December 14, 2011, provided for the conveyance of up to 10,500 af per year

of Tracy's CVP water to Kern for storage under the Semitropic Water Banking and Exchange Program through December 31, 2029. In exchange, Kern will return up to 3,500 af annually of its Table A water to Tracy through December 31, 2030. In 2012, 6,000 af of Tracy's water was delivered to Kern. (SWPAO #10031)

A letter agreement between DWR and Kern, dated July 15, 2011, and executed August 19, 2011, approved the conveyance of up to 53,300 af of Kern-Tulare's 2011 CVP water to Kern under Article 55 of Kern's long-term water supply contract. During 2012, a total of 15,000 af was conveyed to Kern completing the agreement. (SWPAO #11002)

A letter agreement between DWR and Kern, dated November 4, 2011, and executed December 6, 2011, provided for the conveyance of up to 25,000 af of Friant Recirculation Water in association with the San Joaquin River Restoration Program to Kern. Four member units of Kern purchased this non-project water from the Friant CVP contracts to increase their future in-district supplies. Reclamation made this non-project water available at O'Neill Forebay for DWR to convey to Kern under Article 55 of Kern's long-term water supply contract. During 2012, a total of 3,028 af of water was delivered to Kern, completing the agreement. (SWPAO #11017)

A long-term change in point of delivery agreement between DWR and Kern, executed June 8, 2000, approved the delivery of a portion of Kern's allocated annual Table A water to Western Hills Water District (Western Hills). In exchange, Kern will receive a like amount of local water acquired by Western Hills in the Pioneer Groundwater Banking Project. The SWRCB approved Western Hills' service area to be included within the authorized place of use on April 21, 2000. During 2012, a total of 1,258 af of Kern's approved Table A water was delivered to Western Hills. (SWPAO #01001)

### ***Napa County Flood Control and Water Conservation District***

A change in point of delivery agreement among DWR, Napa County Flood Control and Water Conservation District (Napa), and Solano County Water Agency (Solano), executed December 26, 2001, approved the delivery of up to 628 af of Napa's annual Table A water to the City of Vallejo's Water Treatment Plant in Solano's service area. This water is further conveyed to the City of American Canyon, a member agency of Napa. The agreement is effective until December 31, 2035. A total of 44 af of Napa's 2012 Table A water was delivered to Solano's turnouts. (SWPAO #00029)

A change in point of delivery agreement among DWR, Napa, and Solano, executed October 11, 2010, approved the conveyance of up to 500 af per year of the City of Vallejo's Permit Water from Solano's service area to Napa's service area under Article 55 of Napa's long-term water supply contract. The City of Vallejo, a member agency of Solano, has water rights to non-project water originating from Cache Slough and Lindsay Slough, tributaries of the Sacramento River. This agreement provides the City of Vallejo water through Reach 3B of the North Bay Aqueduct, located within Napa's service area. This agreement is effective through December 31, 2035. During 2012, a total of 500 af of water was conveyed under this agreement. (SWPAO #10005)

### ***Palmdale Water District***

An agreement among DWR, Kern, West Kern Water District (West Kern), and Palmdale, dated April 8, 2008, and executed July 23, 2008, provided for the delivery of 5,000 af of Kern's 2007 Table A water to Palmdale, effective September 1, 2007. Palmdale will return 10,000 af of its future Table A water to Kern by December 31, 2017. This 2 for 1 exchange was necessary in order for Palmdale to acquire an additional water supply for 2007. Kern provided 4,926 af for DWR delivery during 2007. During 2012,

Palmdale returned 2,500 af to Kern completing this agreement. (SWPAO #07029)

### ***San Bernardino Valley Municipal Water District***

San Bernardino and Metropolitan entered into *Attachment 2, Coordinated Use Agreement for Conveyance Facilities and State Water Project Water Supplies*, on May 14, 2001. By a letter dated February 27, 2002, DWR acknowledged the agreement and the coordinated use of local facilities currently existing within San Bernardino's jurisdictional boundaries. The coordinated use provided for delivery of San Bernardino's water to Metropolitan's facilities within San Bernardino's service area. This action is permitted under Article 10 of the long-term water supply contracts. A total of 50,000 af was delivered to Metropolitan in 2012. (SWPAO #02035)

### ***Solano County Water Agency***

A settlement agreement among DWR, Solano, and the cities of Fairfield, Vacaville, and Benicia, which includes conveyance service by Solano, was executed May 19, 2003. The agreement provided for delivery through December 31, 2035, of up to 31,620 af per year of settlement water to Solano for delivery through the North Bay Aqueduct to the three cities to help meet their current and future municipal and industrial water needs. During 2012, a total of 2,300 af of settlement water was delivered to Solano for conveyance to the three cities. (SWPAO #03017)

### ***Tulare Lake Basin Water Storage District***

A long-term change in place of use agreement among DWR, Tulare, and Westlands, executed January 7, 2011, approved the delivery of up to 8,000 af per year of Tulare's Table A water to Westlands' turnouts through April 1, 2027. The transfer was made on behalf of two landowners, Hansen Ranches and Newton Farms, that farm in both Tulare's and Westlands' service areas. DWR petitioned the SWRCB

for a temporary change in place of use. The SWRCB issued an order authorizing the long-term change in place of use on November 21, 2011. In 2012, 3,300 af was delivered to Westlands. (SWPAO #10006)

## **Introduction of Local Water Agreements**

An agreement among DWR, Kern, and West Kern, executed December 11, 2012, approved the introduction of Kern's local water into the California Aqueduct at Reach 13B (West Kern Turnout No. 1) at Milepost 240.20. During 2012, no water was moved under this agreement. (SWPAO #12014)

## **Turnout Agreements**

### ***San Luis & Delta-Mendota Water Authority***

On August 22, 2012, DWR executed an agreement with San Luis & Delta-Mendota Water Authority (San Luis and Delta-Mendota) for payment of operation, maintenance, repair, and replacement charges of the Delta-Mendota Canal-California Aqueduct (DMC-CA) Intertie Facilities. The DMC-CA Intertie is located at Milepost 7.2 of the DMC and Milepost 9.1 of the California Aqueduct, and has a design flow of 467 cubic feet per second (cfs) pumped from the DMC into the California Aqueduct. The DMC-CA Intertie also has the capability to gravity flow 900 cfs from the California Aqueduct into the DMC.

### ***Antelope Valley-East Kern Water Agency***

On August 22, 2012, DWR executed an agreement with AVEK for modification, operation and maintenance of the 320th Street West Turnout. Modifications were necessary to upgrade the existing temporary structure to current DWR standards for a permanent turnout. The turnout, located at Milepost 304.8 of the California Aqueduct, has a maximum design capacity of 18 cfs.

On November 9, 2012, DWR executed an amendment to the existing agreement with AVEK for modification, operation and maintenance of the 305th Street West Turnout. The amendment allows AVEK to leave the diesel storage tank on site, as long as all fuel is removed when the turnout is not in use and an inspection of the tank is performed prior to refilling. The turnout, located at Milepost 306.7 of the California Aqueduct, has a maximum design capacity of 27 cfs.

### ***County of Kings***

On June 28, 2012, DWR executed an agreement with Kings and the Green Valley Water District for operation and maintenance of the existing Green Valley Turnout. The turnout, located at Milepost 3.79 of the California Aqueduct's Coastal Branch, has a maximum design capacity of 35 cfs, depending on the operating conditions of the SWP.

### ***Kern County Water Agency***

On May 5, 2012, DWR executed an agreement with Kern for construction, operation and maintenance of the Cross Valley Canal Turn-in/Turnout No. 2. The structure, located at Milepost 238.05 of the California Aqueduct, has a maximum design capacity of 500 cfs. This agreement corrects and supersedes a January 17, 2008, agreement.

### ***Mojave Water Agency***

On May 31, 2012, DWR executed an agreement with Mojave for a right to access its control building at the Highway 395 Turnout for the purpose of accessing essential Supervisory Control and Data Acquisition system information. The turnout, located at Milepost 393.22 of the California Aqueduct, has a maximum design capacity of 50 cfs.



## Activities Related to the Monterey Amendments

### *Storage of Water Outside SWP Contractor Service Areas*

Pursuant to Article 56(c) of the Monterey Amendments, seven SWP water contractors have separate agreements with DWR to convey approved water supplies outside their service areas for storage in existing and operational groundwater storage programs and for future recovery of water to use within their service areas. These change in point of delivery agreements are listed in Table 9-1. These agreements include provisions for conveyance to and from storage, and recovery methods by exchange and/or pump-in to the California Aqueduct. During 2012, a total of 219,589 af was conveyed to storage, including losses, and 35,246 af was recovered from storage.

### *Turn-Back Water Pool Program*

Pursuant to Article 56(d) of the Monterey Amendments, the Turn-Back Water Pool Program was initiated through "Notice to State Water Project Contractors, No. 12-03," dated February 10, 2012. All SWP water contractors who have signed the Monterey Amendments were permitted to participate in the program. The program allowed SWP water contractors to offer a portion of their approved 2012 Table A water for sale in a turn-back pool for use by interested SWP water contractors. Based on Table A supply and demand, the turn-back water pool water was allocated among the purchasing contractors.

Initial offers for sales of water under the Turn-Back Water Pool Program occurred in February 2012. Ventura County Watershed Protection District (Ventura) offered 7,740 af of its approved 2012 Table A water for sale under Pool A of the Turn-Back Water Pool Program. A total of 11 SWP water contractors purchased a portion of the 7,740 af of Pool A Turn-Back water for

\$21.95 per af (50 percent of the 2012 Delta Water Rate). The 2012 Turn-Back Water Pool Program closed on June 1, 2012. Notices to State Water Project Contractors describing the Turn-Back Water Pool Program are available online at DWR's website.

Table 9-2 lists SWP water contractors who participated in Pool A of the 2012 Turn-Back Water Pool Program.

### *Article 21 Water Program*

Pursuant to the Monterey Amendments, Article 21 water replaces surplus, wet weather, and Article 12(d) water. The Article 21 Water Program allows an SWP water contractor to take delivery of water over the approved and scheduled Table A amounts for the current year. Article 21 water is only available for delivery on a short-term basis as determined by DWR when water is still available after operational requirements for SWP water deliveries, water quality, and Delta requirements are met.

Guidelines for the Article 21 Water Program for 2012 are described in the February 6, 2012, "Notice to State Water Project Contractors, No. 12-04," available online at DWR's website. During 2012, Article 21 water was only available to Solano and Napa during Delta excess conditions. A total of 1,027 af of Article 21 water was delivered to Solano.

### *Flexible Storage Program*

Pursuant to Article 54 of the Monterey Amendments, the Flexible Storage Program provides SWP water contractors participating in the repayment of the capital costs of Castaic Lake and Lake Perris the option to withdraw water in excess of approved deliveries. The program objective is to provide additional flexibility to benefit local water management activities. Participating SWP water contractors are given 5 years to replace stored water withdrawn with approved SWP or non-SWP water.

**Table 9-1 Storage of Water Outside SWP Contractor Service Areas in 2012 (acre-feet)<sup>c</sup>**

Contractor	Contract Status	Storage Provider	Stored (include losses, if any)	From Storage	Return By
<b>Alameda-Zone 7</b>					
SWPAO #99018	Continuing	Semitropic WSD	0	0	2035
SWPAO #00037 <sup>b</sup>	Continuing	Semitropic WSD	0	0	2035
SWPAO #01035 <sup>b</sup>	Continuing	Semitropic WSD	0	0	2035
SWPAO #02010	Continuing	Semitropic WSD	0	0	2035
SWPAO #03008 <sup>b</sup>	Continuing	Semitropic WSD	0	0	2035
SWPAO #04017	Continuing	Semitropic WSD	0	0	2035
SWPAO #06010	Continuing	Cawelo WD	18,277	0	2035
<b>Alameda County</b>					
SWPAO #99017	Continuing	Semitropic WSD	0	0	2035
SWPAO #00030	Continuing	Semitropic WSD	0	0	2035
SWPAO #07005	Continuing	Semitropic WSD	0	0	2035
SWPAO #10009	Continuing	Semitropic WSD	6,750	0	2035
<b>Castaic Lake</b>					
SWPAO #02015	Continuing	Semitropic WSD	0	0	2022
SWPAO #03060	Continuing	Semitropic WSD	0	0	2024
SWPAO #05016	Continuing	Rosedale-Rio Bravo WSD	5,710	0	2035
<b>Dudley Ridge</b>					
<i>SWP Water</i>					
SWPAO #08050	Continuing	Kern Water Bank	0	7,236	2035
SWPAO #09002	Continuing	Semitropic WSD	0	0	2035
<i>Non-SWP Water</i>					
SWPAO #09040	Continuing	Kern Water Bank	0	1,000	2020
<b>Metropolitan</b>					
SWPAO #95010	Continuing	Semitropic WSD	40,500	0	2035
SWPAO #01013	Continuing	Arvin-Edison WSD	62,972	10,010	2035
SWPAO #03019	Continuing	Kern Delta WD	45,079	0	2035
SWPAO #03057	Continuing	Mojave WA	0	0	2015
SWPAO #11011	Continuing	Mojave WA	15,019	0	2035
SWPAO #11022	Executed 8/3/2012	Rosedale-Rio Bravo WSD	5,760	0	2017
<b>San Bernardino</b>					
SWPAO #11015	Executed 4/13/2012	Kern Delta WD	19,522	0	2035
<b>Santa Clara</b>					
<i>SWP Water</i>					
SWPAO #99016	Continuing	Semitropic WSD	0	0	2035
SWPAO #00031	Continuing	Semitropic WSD	0	0	2035
SWPAO #06011	Continuing	Semitropic WSD	0	0	2035
SWPAO #10012	Continuing	Semitropic WSD	0	0	2035
<i>Non-SWP Water</i>					
SWPAO #06012	Continuing	Semitropic WSD	0	17,000	2035
SWPAO #10029	Continuing	Semitropic WSD	0	0	2035
SWPAO #11012	Continuing	Semitropic WSD	0	0	2035
<b>Total<sup>a</sup></b>			<b>219,589</b>	<b>35,246</b>	

<sup>a</sup> Total acre-feet indicates all water recovered from various water banks. Some of the recovered water may be temporarily stored in SWP facilities. Amounts include losses, if any.

<sup>b</sup> Indicates amendments to agreement.

<sup>c</sup> Storage amounts in this table may differ from the amounts in Table 9-7 due to water type reclassification.



**Table 9-2 2012 Turn-Back Water Pool Program (acre-feet)**

Contractor	Sold	Purchased
<b>Pool A</b>		
Ventura	7,740	
Alameda-Zone 7		179
Alameda County <sup>a</sup>		93
Coachella		307
Kings		21
Desert <sup>b</sup>		124
Dudley Ridge		112
Kern (Agricultural)		2,180
Napa		64
Santa Clara <sup>c</sup>		222
Metropolitan		4,241
Tulare		197
<b>Total</b>	<b>7,740</b>	<b>7,740</b>

<sup>a</sup> Alameda County Water District

<sup>b</sup> Desert Water Agency

<sup>c</sup> Santa Clara Valley Water District

Flexible storage allows for withdrawal of up to 160,000 af at Castaic Lake and 65,000 af at Lake Perris. SWP water contractors participating in the Castaic Lake Flexible Storage Program include Metropolitan, Ventura, and Castaic Lake. These contractors are allowed to withdraw up to a maximum of 153,940 af, 1,377 af, and 4,683 af, respectively. Metropolitan is the only SWP water contractor allowed to withdraw water from Lake Perris, up to a maximum of 65,000 af.

Metropolitan was the only participant in the Flexible Storage Program in 2012 at Castaic Lake. At the beginning of 2012, Metropolitan owed 0 af in both Castaic Lake and Lake Perris. During 2012, Metropolitan withdrew 35,000 af from storage in Castaic Lake and provided 35,000 af to storage in Castaic Lake, ending 2012 with a balance of 0 af.

### Extended Carryover Program

Pursuant to Article 56 of the Monterey Amendments, SWP water contractors can elect to store SWP water outside of their service areas and carry it over to the following year for use within their service areas. Qualified contractors can request the carryover of Table A water for delivery in the following year to the extent that such deliveries do not adversely affect current or future project operations. Factors that influence how much extended carryover water can be delivered include operational constraints of project facilities, filling of SWP conservation storage facilities, flood control releases, and water quality restrictions. If storage requests exceed the available storage capacity, the amount available is allocated among the SWP water contractors requesting storage in proportion to their annual Table A amount for that year. Twenty-three SWP water contractors took delivery of Article 56(c) in the amount of 393,435 af of previously approved Table A water carried over into 2012, as extended carryover.

### 2012 SWP Contractors Dry Year Transfers

Due to the initial projections forecasting dry hydrologic conditions for 2012, two SWP contractors experiencing continued water supply shortages within their service areas signed an agreement with the State Water Contractors (SWC) to manage supplemental water purchases in 2012. The SWC executed transfer agreements with four agencies on the Feather River (sellers) for the sale of water to the two SWP buyers.

A total of 67,079 af was made available to the SWP buyers from crop idling. See Table 9-3 for a list of agencies that provided transfer water to the SWC purchase program. DWR executed four agreements with the SWP buyers and sellers for the conveyance of transfer water through SWP facilities. Due to operational constraints at Oroville Dam,

**Table 9-3 2012 Dry Year Transfers Seller Activity (acre-feet)**

Sellers	SWPAO #	Transfer Action	Transfer Water Available
Biggs-West Gridley WD	12-100	Crop Idling	14,353
Butte WD	12-101	Crop Idling	10,286
Richvale ID	12-103	Crop Idling	16,974
Western Canal WD	12-104	Crop Idling	25,466
<b>Total</b>			<b>67,079</b>

DWR was unable to release the transfer water during the 2012 transfer window. The transfer water was stored in Lake Oroville and is expected to be released during July through September of 2013. With projected conveyance losses, including Delta carriage water losses of 30 percent, a total of 46,955 af of transfer water will be delivered to the SWP buyers in 2013. See Table 9-4 for a list of the SWP buyers and the quantities delivered at the SWP buyer's turnouts.

## Lower Yuba River Accord

The Lower Yuba River Accord (Yuba Accord) was announced in 2005 to settle long-standing litigation over instream flows in the Yuba River in relation to fisheries. The purpose of the Yuba Accord is to resolve instream flow issues associated with the operation of the Yuba River Development Project in a way that protects and enhances lower Yuba River fisheries and local water supply reliability. The Yuba River Development Project provides revenues for local flood control and water supply projects, water to enhance SWP and CVP water supply reliability by offsetting Delta export

reductions for the protection and restoration of Sacramento-San Joaquin Delta fisheries, and improvements in statewide water supply management, including dry year water supplies for participating SWP and CVP water contractors.

The Yuba Accord is based on three sets of agreements: a water purchase agreement with DWR, including water to help offset Delta export reductions and dry year water for participating SWP and CVP water contractors; conjunctive use agreements with Yuba County Water Agency (Yuba) member units; and a fisheries agreement resolving minimum flows. The Yuba Accord provides for higher releases into the Yuba River to benefit Chinook Salmon and steelhead, transfer water to help offset Delta export reductions annually, and dry year transfer water for SWP and CVP water contractors from both surface and groundwater substitution sources.

The required agreements were executed in late 2007 and early 2008, and the SWRCB approved the Yuba Accord on

**Table 9-4 2012 Dry Year Transfers Buyer Activity (acre-feet)**

Buyers	Water Available to Buyer	Estimated Losses <sup>a</sup>	Net Water Delivered <sup>b</sup>
Dudley Ridge	3,269	981	2,288
Kern	63,810	19,143	44,667
<b>Total</b>	<b>67,079</b>	<b>20,124</b>	<b>46,955</b>

<sup>a</sup> Estimated conveyance losses assuming a Delta carriage water loss of 30 percent in 2013 for water conveyed through the Delta.

<sup>b</sup> Due to operational issues at Oroville Dam, the 2012 transfer water was stored in Oroville. It is anticipated that it will be released in 2013.

March 25, 2008, setting the flow schedules for the river and authorizing accord-based water transfers through 2025. During that same period, DWR completed the execution of 22 agreements for dry year supplies for participating SWP and CVP water contractors under the accord. A total of 166,086 af was transferred to DWR and participating SWP and CVP water contractors under the accord in 2008, 180,000 af was transferred in 2009, and 141,856 af was transferred in 2010. In 2011, excess conditions in the Delta prevented accounting of Yuba releases as transfer water for the entire summer transfer season.

In 2012, Yuba delivered 60,000 af of Component 1 water to DWR to help offset Delta export pumping reductions to benefit fish, and 21,681 af of dry year water was provided to participating contractors. The dry year water was all accounted as Component 3 water. No groundwater substitution water was provided in 2012.

An additional 4,138 af of Yuba releases was backed into Lake Oroville during balanced conditions in February 2012, but was displaced (“spilled”) when flood control releases occurred in May. In October 2012, Yuba released 16,381 af of potentially transferable surface water that could not be backed into Lake Oroville due to facility restrictions at the Hyatt Powerplant and fish flow restrictions in the Feather River, and it was therefore lost as transfer water.

In April 2009, two amendments to the Yuba Accord’s water purchase agreement were executed. Amendment Number 1 resolved a technical issue related to refill accounting, and Amendment Number 2 addressed pricing issues for groundwater substitution water.

Amendment Number 3 was executed April 22, 2010, and addressed market pricing issues for groundwater substitution water.

On January 6, 2012, Amendment Number 4 to the Yuba Accord’s water purchase agreement was executed. Amendment Number 4 provides for annual negotiations of groundwater substitution water pricing, prioritizing SWP water contractors’ Delta export transfer supplies, and optionally suspending certain accounting rules to permit all groundwater substitution water to be classified as Component 4 water.

Under Amendment Number 4, all accrued groundwater substitution water is payable although it may not be exported. The single exception is that DWR and Yuba Accord water contractors will not be required to pay for the portion (if any) of groundwater substitution component water that is released in accordance with the provisions of the Yuba Accord Fisheries Agreement, Section 5.1.8, Supplemental Flows for Groundwater Substitution Programs. When New Bullards Bar Reservoir is releasing extra water due to a wet winter, Yuba may not reduce releases or accrue groundwater substitution water during the following irrigation season.

In 2012, DWR and Reclamation signed an agreement (SWPAO #12300) to share, equally, Component 1 water made available from 2012 through 2015. The letter agreement between the respective project operations offices replaces a 2008 letter agreement that shared the water differently—namely that the project that experienced the greater export reductions at the Delta pumps would receive the initial share of Component 1 water until the reductions were equally offset; then the water would be shared equally. In the past, the SWP has experienced export reductions greater than the CVP by more than 60,000 af. The SWP has therefore been the beneficiary of the Component 1 water.

The agreement provides that:

- Component 1 water is shared equally from 2012 through 2015;
- as per the Yuba Accord, Component 1 water provided to Reclamation will be delivered at the Marysville Gauge on the Yuba River; and

- DWR will provide conveyance at Banks Pumping Plant pursuant to the Joint Point of Diversion Agreement with Reclamation.

Table 9-5 shows Lower Yuba River Accord water deliveries in 2012.

**Table 9-5 Lower Yuba River Accord Water Deliveries, 2012 (acre-feet)**

<b>Participating Contractor</b>	<b>Allocated Component 3 Water</b>	<b>Carriage and Conveyance Losses</b>	<b>Water Delivered</b>
<b>SWP Contractor</b>			
Metropolitan	-	-	-
Kern	6,993	2,098	4,895
Alameda-Zone 7	574	172	402
AVEK	-	-	-
Castaic Lake	-	-	-
Yuba City	-	-	-
Coachella	985	295	690
Kings	66	20	46
Crestline	-	-	-
Desert	397	119	278
Dudley Ridge	358	107	251
Empire	-	-	-
Littlerock	-	-	-
Napa	-	-	-
Oak Flat	-	-	-
Palmdale	-	-	-
San Bernardino	-	-	-
San Geronio	123	37	86
Santa Clara	712	214	498
Solano	-	-	-
Tulare	633	190	443
<i>SWP Contractor Total</i>	<i>10,841</i>	<i>3,252</i>	<i>7,589</i>
<b>Non-SWP Contractor</b>			
San Luis & Delta-Mendota	10,840	3,404	7,436
<i>Subtotal, Component 3 Water</i>	<i>21,681</i>	<i>6,656</i>	<i>15,025</i>
DWR Component 1 Water (EWA) <sup>a</sup>	30,000	9,000	21,000
Reclamation Component 1 Water (EWA) <sup>a</sup>	30,000	9,420	20,580
<b>Grand Total</b>	<b>81,681</b>	<b>25,076</b>	<b>56,605</b>

<sup>a</sup> Previously, Environmental Water Account

## Agreements with Non-SWP Agencies

In addition to negotiating agreements with long-term SWP water contractors to provide for specified water deliveries, DWR also enters into agreements with other agencies to provide water conveyance service.

## Reclamation—Joint Point of Diversion

In 2012, DWR renewed the Joint Point of Diversion (JPOD) agreement with Reclamation. Under the JPOD, DWR makes excess SWP conveyance capacity available to Reclamation for the conveyance of water from the Delta at Banks Pumping Plant to O'Neill Forebay. This includes (1) make up for curtailed water exports from C.W. "Bill" Jones (Jones) Pumping Plant associated with improving conditions for fish in the Delta; (2) replacing water exports foregone during maintenance and repair of CVP facilities between the Delta and O'Neill Forebay; and (3) Reclamation's share of Component 1 water provided under the Yuba Accord. As part of the JPOD, the first 21,000 af conveyed through Banks Pumping Plant for the months of July, August, and September of each year will include a charge for the temporary barriers in the Delta. In 2012, DWR delivered 21,666 af of CVP water to Reclamation in August and September under this agreement. This agreement is effective March 1, 2012, through February 29, 2016. (SWPAO #12300)

## Reclamation and Byron-Bethany Irrigation District—Musco Family Olive Company

A pending agreement among DWR, Byron-Bethany Irrigation District (Byron-Bethany), and Reclamation, provides for the conveyance of up to 800 af of Byron-Bethany's CVP water to repayment Reach 2A of the California Aqueduct for use by Musco Family Olive Company. DWR delivered a total of

526 af in 2012 under this pending agreement. (SWPAO #04300)

## Reclamation and Cross Valley Canal Contractors

Through eight, 3-party contracts with Reclamation and Cross Valley Canal (CVC) water contractors, DWR conveys CVP water for CVC water contractors via the California Aqueduct through the CVC turnout at Reach 12E. The following eight CVP water contractors are defined as CVC water contractors: County of Fresno (Fresno), County of Tulare (Tulare), Hills Valley Irrigation District (Hills Valley), Kern-Tulare Water District (Kern-Tulare), Lower Tule River Irrigation District (Lower Tule), Pixley Irrigation District (Pixley), Rag Gulch Water District (Rag Gulch), and the Tri-Valley Water District (Tri-Valley). Effective January 1, 2009, Rag Gulch consolidated under Kern-Tulare. DWR approved assignment of Rag Gulch's Interim Renewal Contract to Kern-Tulare on April 7, 2009.

Fresno, Tulare, Lower Tule, and Pixley executed contracts in 1975. Hills Valley, Kern-Tulare, Rag Gulch, and Tri-Valley executed contracts in 1976. All eight original contracts terminated on December 31, 1995. In 1995, amendments were executed that extended the termination dates to February 29, 1996, for all contracts. Interim Renewal (IR) contracts have been executed during the ensuing years to extend the termination dates as follows:

- March 1, 1996, through February 28, 1998 (IR 1);
- March 1, 1998, through February 29, 2000 (IR 2);
- March 1, 2000, through November 30, 2000 (IR 3);
- December 1, 2000, through February 28, 2001 (IR 4);
- March 1, 2001, through February 28, 2002 (IR 5);



- March 1, 2002, through February 28, 2003 (IR 6);
- March 1, 2003, through February 29, 2004 (IR 7);
- March 1, 2004, through February 28, 2005 (IR 8);
- March 1, 2005, through February 28, 2006 (IR 9);
- March 1, 2006, through February 28, 2007 (IR 10);
- March 1, 2007, through February 29, 2008 (IR 11);
- March 1, 2008, through February 28, 2010 (IR 12);
- March 1, 2010, through February 29, 2012 (IR 13); and
- March 1, 2012, through February 28, 2014 (IR 14).

During 2012, DWR delivered a total of 27,539 af of CVP water to CVC water contractors in accordance with the terms of IR 13 and 14 as follows: Fresno, 22,193 af; Kern-Tulare, 1,428 af; Tulare, 2,123 af; Hills Valley, 1,338 af; and Tri-Valley, 457 af.

Additionally, Lower Tule, Pixley, and Kern-Tulare requested a change in point of delivery for their 2012 CVP water from the Delta to Reaches 4 through 7. DWR approved the requests and conveyed the water to Westlands Water District during 2012 as follows: Lower Tule, 12,441 af (SWPAO #12310); Pixley, 12,441 af (SWPAO #12311); and Kern-Tulare, 1,000 af (SWPAO #12312).

### **Reclamation and Kern National Wildlife Refuge—U.S. Fish and Wildlife Service**

A letter agreement sent by DWR on September 28, 2004, and accepted by Reclamation on January 24, 2005, provided for DWR to deliver up to 30,500 af of CVP water to the Kern National Wildlife Refuge during the term May 1, 2002, through May 31, 2009. By Amendment Number 2, sent by DWR on June 17,

2008, and accepted by Reclamation on August 1, 2008, the term was extended to May 31, 2012. A new letter agreement sent by DWR on September 17, 2012, and accepted by Reclamation on September 21, 2012, provided for DWR to deliver up to 30,500 af of CVP water to the Kern National Wildlife Refuge during the term of June 1, 2012, through September 30, 2028. Under these agreements, DWR conveys CVP water from the end of Reach 7 to Buena Vista Water Storage District's turnouts in Reaches 10A and 12E of the California Aqueduct. DWR conveyed a total of 18,746 af during 2012. (SWPAO #03317 and #12309)

### **Reclamation and San Joaquin Valley National Cemetery—U.S. Department of Veterans Affairs**

A pending letter agreement among DWR, Reclamation, and the U.S. Department of Veterans Affairs provides for the conveyance of up to 850 af of CVP water to Reach 2B of the California Aqueduct for the U.S. Department of Veterans Affairs' San Joaquin Valley National Cemetery. DWR delivered a total of 268 af to the national cemetery through Reach 2B of the California Aqueduct in 2012 under this pending agreement. (SWPAO #10310)

## **Water Deliveries**

### **Table A Deliveries**

Each year, by October 1, the SWP water contractors submit initial requests for Table A deliveries allocated to them for use in the subsequent calendar year. Initial Table A allocation amounts for the coming year are made by DWR in December. They are based on operations studies that assume 90 percent exceedence of historical water supply (where exceedence refers to the possibility that water supply in the coming year will be exceeded by the historical water supply), current reservoir storage, and total requests by the SWP

water contractors. Forecasts for the year are updated as hydrologic conditions change. Table A amounts are increased or decreased depending on both actual and projected hydrologic conditions, though decreases are rare as the 90 percent exceedence criterion is fairly conservative.

On October 1, 2011, SWP water contractors submitted initial requests for 2012 totaling 4.17 million acre-feet (maf).

DWR approved delivery of 2.50 maf on November 18, 2011, resulting in initial Table A amounts of 60 percent of most SWP water contractor requests. DWR increased the 2012 Table A amounts to 2.71 maf, for a final allocation of 65 percent, on April 16, 2012. Table 9-6 lists the changes in Table A amounts that were approved by DWR based on updated hydrologic conditions.

**Table 9-6 2012 Allocated Table A Amounts**

Notice to SWP Contractors No.	Allocation Amount (maf)	Percentage of Requested Water
11-07	2.50	60
12-05	2.09	50
12-07	2.50	60
12-09	2.71	65

### 2012 SWP Deliveries

The SWP delivers water for a variety of beneficial uses. In addition to delivering Table A water to SWP water contractors, the SWP:

- conveys water to other public and local agencies through special contracts and agreements;
- provides water for wildlife and recreational uses; and
- stores, releases, and delivers local runoff water from SWP facilities to agencies that hold local water rights.

In 2012, 3,967,453 af of SWP and non-SWP water was delivered to 29 long-term SWP water contractors and 21 other agencies.

The portion delivered to the SWP water contractors was 2,836,231 af, categorized as follows:

- 1,797,929 af of Table A water;
- 346,064 af of transferred Table A water;
- 34,738 af of exchanged Table A water;
- 7,740 af of Pool A water;
- 1,027 af of Article 21 water;
- 393,435 af of 2011 carryover water (Article 12(e) and Article 56(c));
- 105,128 af recovered from water banks;
- 35,000 af of flexible storage withdrawal;
- 2,300 af of settlement water;
- 3 af of SWP water for recreation and fish and wildlife;
- 7,588 af of 2012 Dry Year Purchase Program water;
- 16,899 af of local water;
- 28,414 af of water transfer;
- 54,624 af of general conveyance water;
- 4,343 af of operations exchange water; and
- 999 af of permit water.

The remaining portion was delivered to 21 non-SWP agencies and totaled 1,131,222 af, which was categorized accordingly:

- 1,072,695 af of local water;
- 1,606 af of permit water; and
- 56,921 af delivered to satisfy agreements between the SWP and CVP.

Figure 9-1 shows amounts of water delivered to various locations during 2012.

Specific information about water deliveries made to SWP water contractors and other agencies during 2012, and historical deliveries from 1962 through 2012, is





presented in the following three sections, each with a corresponding table located at the end of the chapter:

- Water Delivered to Long-term Water Supply Contractors in 2012, by Service Area (Table 9-7);
- Total Amounts of Water Delivered in 2012, by Month (Table 9-8); and
- Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2012 (Table 9-9).

Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than was available at the time of publication, please consult the most recent edition of Bulletin 132 and/or contact DWR staff in the State Water Project Analysis Office.

## 2012 Water Deliveries to Long-term SWP Water Contractors

Table 9-7 shows amounts delivered in 2012 by service area. The following information is arranged by column number.

### *Table A Water Delivered*

Columns 1 through 5 show a detailed breakdown of Table A water delivered for SWP water contractors in 2012.

### *Turn-Back Pool Water*

Column 4 shows 7,740 af of Turn-Back Pool Water delivered to SWP water contractors in 2012.

### *Carryover Table A Water Delivered in 2012*

Column 6 shows a total of 393,435 af was carried over from previous years for delivery in 2012.

The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating the contractors to use or lose water by December 31 of each year. The SWP water contractors' long-term contracts and amendments state the criteria for carrying over Table A water from one year to the next under Articles 12(e), 14(b), and 56(c).

### *Total Table A Water Delivered*

Column 7 shows all Table A water delivered in 2012—a total of 2,579,906 af.

### *Article 21*

Column 8 shows 1,027 af of 2012 Article 21 water was delivered to SWP water contractors.

### *Other SWP Water*

Column 9 shows 37,300 af of other SWP water. Other SWP water includes flexible withdrawal water from Castaic Lake and Lake Perris, and settlement water.

### *Total SWP Water Delivered*

Column 10 shows 2,618,233 af of total SWP water was delivered in 2012. This includes total Table A water, 2011 Table A carryover water, Article 21 water, and other SWP water consisting of settlement and flexible withdrawal water.

### *Non-SWP Water Deliveries*

Columns 11 and 12 include deliveries of non-SWP water to long-term water contractors. Column 11 shows 105,128 af of water bank recovery water. Column 12 shows 112,870 af of other non-SWP water. Other non-SWP water is local and permit water that an SWP water contractor has a water right to, or has purchased from, exchanged with, or transferred from non-SWP agencies. In 2012, non-SWP water deliveries totaled 112,870 af.

## Total Deliveries

Column 13 shows total amounts of water delivered to SWP water contractors. In 2012, the SWP delivered 2,836,231 af of water to 29 long-term contractors.

## Water Delivered in 2012 by Month

During 2012, the SWP provided water service to 50 agencies, including 29 long-term SWP water contractors. Those agencies and the amounts of water delivered to them by month are listed in Table 9-8 and are summarized below as SWP water and non-SWP water.

### SWP Water

SWP water, as defined in the long-term water supply contracts, includes Article 21 water, carryover Table A water, current year Table A amounts, transfer and exchange of Table A water, and Turn-Back Pools A and B. Detailed information concerning those conveyances for 2012 is found under the "Miscellaneous Agreements with Long-term SWP Water Contractors" section in this chapter.

### Non-SWP Water

In 2012, DWR used SWP facilities to convey non-SWP water for various agencies according to the terms of water rights and water transfer and exchange agreements. Detailed information concerning those conveyances is in this chapter.

**Last Chance Creek Water District.** Under the water supply agreement between DWR and Last Chance Creek Water District, dated May 7, 2007, a total of 10,385 af was supplied from Frenchman Reservoir to Last Chance Creek Water District.

**Water Rights Water.** Water in this category is transported through SWP facilities to agencies with settlement agreements with DWR. Some water passes through SWP transportation facilities; some is stored in

SWP reservoirs for release later. In 2012, the following water was delivered to the Feather River, Delta, North Bay, South Bay, and Southern California areas, as summarized below.

**Feather River Area.** Seven non-SWP agencies received 1,037,447 af, under their water right settlement agreements, as follows:

- Western Canal Water District, 302,318 af;
- Joint Water Districts Board, 696,468 af;
- Oswald Water District, 1,096 af;
- Tudor Mutual Water Company, 2,572 af;
- Garden Highway Mutual Water Company, 19,557 af;
- Plumas Mutual Water Company, 9,069 af; and
- Valberde and Ramelli, 131 af.

DWR conveyed local water totaling 6,236 af through SWP facilities on behalf of two non-SWP agencies:

- Thermalito Water and Sewer District (formerly Thermalito Irrigation District), 1,850 af; and
- South Feather Water and Power Agency (formerly Oroville-Wyandotte Irrigation District), 4,386 af.

**Delta.** In the Delta, 24,994 af of Byron-Bethany water was delivered pursuant to the May 28, 2003, *Agreement Between the Department of Water Resources of the State of California and the Byron-Bethany Irrigation District Regarding the Diversion of Water from the Delta*.

DWR delivered 22,249 af of water to East Contra Costa Irrigation District pursuant to the January 7, 1981, *Contract Between the State of California Department of Water Resources and the East Contra Costa Irrigation District for the Assurance of a Dependable Water Supply of Suitable Quality*.



**North Bay Area.** Deliveries in the North Bay area included 999 af of Vallejo permit water and 2,300 af of water delivered pursuant to the May 19, 2003, *Settlement Agreement among DWR, Solano County Water Agency, and the Cities of Fairfield, Vacaville, and Benicia*.

**South Bay Area.** In the South Bay area, a total of 16,433 af of local water was delivered to Alameda-Zone 7 and Alameda County. These two South Bay Aqueduct (SBA) SWP water contractors hold water rights to runoff from the Lake del Valle watershed.

**Southern California Area.** In the Southern California area, 335 af of local runoff from the Houston Creek watershed was stored and delivered to Crestline-Lake Arrowhead Water Agency (Crestline) under water rights held by DWR on Houston Creek. The authorized place of use is limited to the Crestline Lake Arrowhead area.

## Annual Table A Water and Water Delivered Since 1962

Information about 2012 annual Table A water and water conveyed, by type, for the previous 50 years is contained in Table 9-9. The following discussion of conveyed Table A water is arranged according to column numbers.

### Annual Table A Water

Columns 1 through 7 of Table 9-9 show the amount of SWP water contractors' annual Table A water by area for years 1962 through 2012 as specified in the Table A schedules of the long-term water supply contracts.

In some instances, Table A schedules—projections of each contractor's need for water to 2035—have been amended to meet the needs of individual contractors. The amounts of annual Table A water each SWP water contractor may request for years 1962 through 2035 can be found in Table B-4 in Appendix B in the back of this bulletin.

### Water Delivered

Columns 8 through 16 show water delivered or conveyed, including initial fill water and operational losses and storage changes.

**Table A Water.** Column 8 shows amounts of Table A water delivered each year from 1962 through 2012. In 2012, a total of 2,579,906 af of Table A water was delivered.

### Article 21 and Unscheduled Water.

Column 9 shows amounts of Article 21 water, as defined under SWP deliveries, and unscheduled water delivered from 1962 through 2012. Article 21 and unscheduled water is water in excess of that required to meet all demands for the year's Table A water and water to be stored in SWP reservoirs. In 2012, a total of 1,027 af of Article 21 water was delivered. No unscheduled water was delivered.

**Other Water.** Column 10 includes amounts of water classified as other water delivered in 2012, including non-SWP water conveyed through SWP facilities and regulated delivery of local supply. In 2012, a total of 337,079 af of other water was delivered.

**Feather River Diversions.** Column 11 includes amounts of water from the Feather River delivered according to agreements with non-SWP agencies on the Feather River, including Last Chance Creek Water District. In 2012, a total of 1,047,832 af in this category was delivered to agencies in the Feather River area.

**Recreation Water.** Column 12 shows water conveyed for recreational use or to improve water quality for fish and wildlife. In 2012, a total of 1,609 af of SWP water was conveyed for this purpose.

**Initial Fill Water.** The quantities listed in Column 14 represent the amounts used to initially fill the aqueducts and reservoirs south of the Delta to maximum operating

capacities. Initial filling began in 1962, with the filling of the SBA, and was completed in 1979, when Lake Perris reached its maximum operating capacity of 127,000 af. In 1996 and 1997, the Coastal Aqueduct was initially filled.

**Operational Losses.** Column 15 includes the total amounts of water lost through evaporation and seepage, net storage changes in reservoirs south of the Delta, and amounts of inflow from local drainage areas, including inflows into San Luis Canal and from the Kern River Intertie. Negative values are indicated for years when withdrawals and evaporation from reservoirs south of the Delta exceed the amounts of water added to the reservoirs.

**Table 9-7 Water Delivered to Long-term Contractors in 2012, by Service Area (acre-feet)<sup>a</sup>**

SWP Contractor	Table A Water Deliveries					SWP Water					Non-SWP Water		Total Water Delivered (13)
	2012 Table A Not Transferred, Exchanged, or Stored (1)	2012 Table A Transferred or Exchanged (2)	2012 Table A Stored (3)	2012 Turn-Back Pools (4)	Total 2012 Table A (5)	2011 Carryover (6)	Total Table A (7)	2012 Article 21 (8)	Other SWP Water (9)	Total SWP Water (10)	Water Bank Recovery (11)	Other Non-SWP Water (12)	
<b>Feather River</b>													
Butte	1,374	16,501			17,875		17,875			17,875		3	17,878
Plumas	79				79		79			79		131	210
Yuba City	2,695				2,695		2,695			2,695			2,695
<b>North Bay</b>													
Napa	5,018	44		64	5,126	4,278	9,404			9,404			9,404
Solano	3,428				3,428	22,096	25,524	1,027	2,300	28,851		999	29,850
<b>South Bay</b>													
Alameda-Zone 7	11,993	20,308		179	32,480	20,357	52,837			52,837		13,883	66,720
Alameda County	4,451	7,500		93	12,044	8,787	20,831			20,831		4,952	25,783
Santa Clara	34,612			222	34,834	11,462	46,296			46,296		498	46,794
<b>San Joaquin Valley</b>													
Kings	2,668	2,669		21	5,358	2,001	7,359			7,359		46	7,405
Dudley Ridge	7,096	10,598		112	17,806		17,806			17,806	2,168	8,489	28,463
Empire	630	838			1,468	774	2,242			2,242			2,242
Kern	537,711	18,258		2,180	558,149	32,477	590,626			590,626	92,950	68,672	752,248
Oak Flat	2,596				2,596	612	3,208			3,208			3,208
Tulare	37,530	16,100		197	53,827	32,081	85,908			85,908		9,809	95,717
<b>Central Coastal</b>													
San Luis Obispo	3,111				3,111	833	3,944			3,944			3,944
Santa Barbara	19,474	1,400			20,874	43	20,917			20,917			20,917
<b>Southern California</b>													
AVEK	42,183	38,511			80,694	32,854	113,548			113,548			113,548
Castaic Lake	27,207	15,500			42,707	11,350	54,057			54,057			54,057
Coachella	89,928			307	90,235	22,663	112,898			112,898		4,689	117,587
Crestline	624				624		624			624		335	959
Desert	36,238			124	36,362	8,461	44,823			44,823		278	45,101
Littlerock					0		0			0			0
Metropolitan	871,009	180,075		4,241	1,055,325	118,172	1,173,497		35,000	1,208,497	10,010		1,218,507
Mojave	4,672				4,672	6,572	11,244			11,244			11,244
Palmdale	7,459	2,500			9,959	4,736	14,695			14,695			14,695
San Bernardino	15,102	50,000			65,102	47,870	112,972			112,972			112,972
San Gabriel	18,720				18,720		18,720			18,720			18,720
San Geronio	5,968				5,968	4,956	10,924			10,924		86	11,010
Ventura	4,353				4,353		4,353			4,353			4,353
<b>Totals</b>	<b>1,797,929</b>	<b>380,802</b>	<b>—</b>	<b>7,740</b>	<b>2,186,471</b>	<b>393,435</b>	<b>2,579,906</b>	<b>1,027</b>	<b>37,300</b>	<b>2,618,233</b>	<b>105,128</b>	<b>112,870</b>	<b>2,836,231</b>

<sup>a</sup>Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than was available at the time of publication, please consult the most recent publication of Bulletin 132 and/or contact DWR staff in the State Water Project Analysis Office.

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Total Deliveries
<b>FEATHER RIVER AREA</b>													
<i>SWP Agencies</i>													
City of Yuba City													
Table A	0	0	0	0	0	16	1,291	1,231	57	100	0	0	2,695
Agency Total	0	0	0	0	0	16	1,291	1,231	57	100	0	0	2,695
County of Butte													
Table A	59	115	20	18	134	137	155	375	148	64	12	137	1,374
Table A Transfer to Dudley Ridge*	0	0	0	0	0	0	0	1,382	0	0	0	0	1,382
Table A Transfer to Kern*	0	0	0	0	0	0	0	8,258	0	0	0	0	8,258
Table A Transfer to Palmdale*	0	0	0	0	0	0	0	1,325	1,865	1,633	1,077	961	6,861
Recreation/Fish and Wildlife (SWP)													
Recreation/Fish and Wildlife	0	0	1	0	0	1	0	0	1	0	0	0	3
Agency Total (*excluded from total)	59	115	21	18	134	138	155	375	149	64	12	137	1,377
Plumas County Flood Control and Water Conservation District													
Table A	0	0	0	0	0	0	0	0	79	0	0	0	79
Agency Total	0	0	0	0	0	0	0	0	79	0	0	0	79
<i>Non-SWP Agencies</i>													
Garden Highway Mutual Water Company													
Regulated delivery of local supply	0	0	161	412	3,300	3,756	3,511	3,758	896	3,564	199	0	19,557
Joint Water Districts Board													
Regulated delivery of local supply	34,461	0	0	363	99,761	105,785	119,540	107,973	53,035	40,450	79,960	55,140	696,468
Last Chance Creek Water District													
Regulated delivery of local supply	0	0	0	415	2,624	2,345	1,864	1,829	801	412	95	0	10,385
Oswald Water District													
Regulated delivery of local supply	0	0	0	0	190	234	223	208	175	66	0	0	1,096
Plumas Mutual Water Company													
Regulated delivery of local supply	0	0	697	0	954	2,148	2,204	1,183	1,559	324	0	0	9,069
South Feather Water and Power Agency													
Regulated delivery of local supply	109	103	78	58	474	712	764	796	724	437	131	0	4,386
Thermalito Irrigation District													
Regulated delivery of local supply	96	76	85	91	170	266	269	239	244	144	91	79	1,850
Tudor Mutual Water Company													
Regulated delivery of local supply	0	0	40	10	168	347	718	637	579	73	0	0	2,572
Western Canal Water District													
Regulated delivery of local supply	9,827	0	0	333	46,154	49,989	60,226	49,554	11,543	22,130	41,897	10,665	302,318

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Total Deliveries
Valberde and Ramelli													
Regulated delivery of local supply	0	0	0	0	0	0	0	0	119	12	0	0	131
SWP	59	115	21	18	134	154	1,446	1,606	285	164	12	137	4,151
Non-SWP	44,493	179	1,061	1,682	153,795	165,582	189,319	166,177	69,675	67,612	122,373	65,884	1,047,832
<b>Feather River Area Total</b>	<b>44,552</b>	<b>294</b>	<b>1,082</b>	<b>1,700</b>	<b>153,929</b>	<b>165,736</b>	<b>190,765</b>	<b>167,783</b>	<b>69,960</b>	<b>67,776</b>	<b>122,385</b>	<b>66,021</b>	<b>1,051,983</b>
<b>NORTH BAY AREA</b>													
<i>SWP Agencies</i>													
Napa County Flood Control and Water Conservation District													
Table A	0	0	0	0	0	0	0	0	1,610	1,452	1,069	887	5,018
Table A Point of Delivery through Solano*	0	0	0	0	10	8	6	10	10	0	0	0	44
Pool A	0	0	0	0	0	0	0	0	0	0	0	64	64
Article 56(c) Carryover	775	193	88	212	560	926	762	762	0	0	0	0	4,278
Vallejo Permit to Napa	0	0	0	0	0	0	200	200	100	0	0	0	500
Vallejo Permit to American Canyon*	2	18	2	0	7	3	5	5	5	3	3	1	54
Agency Total (*excluded from total)	775	193	88	212	560	926	962	962	1,710	1,452	1,069	951	9,860
Solano County Water Agency													
Table A	0	0	0	0	0	0	185	924	955	462	737	165	3,428
Table A Point of Delivery from Napa	0	0	0	0	10	8	6	10	10	0	0	0	44
Article 56(c) Carryover	1,585	84	103	89	780	3,294	3,840	3,551	3,062	3,017	2,357	334	22,096
Article 21	0	0	105	89	633	200	0	0	0	0	0	0	1,027
Settlement	0	0	0	0	0	800	900	0	600	0	0	0	2,300
Vallejo Permit to Napa*	0	0	0	0	0	0	200	200	100	0	0	0	500
Vallejo Permit	0	0	0	0	0	0	0	0	0	0	445	0	445
Vallejo Permit to American Canyon	2	18	2	0	7	3	5	5	5	3	3	1	54
Agency Total (*excluded from total)	1,587	102	210	178	1,430	4,305	4,936	4,490	4,632	3,482	3,542	500	29,394
SWP	2,360	277	296	390	1,983	5,228	5,693	5,247	6,237	4,931	4,163	1,450	38,255
Non-SWP	2	18	2	0	7	3	205	205	105	3	448	1	999
<b>North Bay Area Total</b>	<b>2,362</b>	<b>295</b>	<b>298</b>	<b>390</b>	<b>1,990</b>	<b>5,231</b>	<b>5,898</b>	<b>5,452</b>	<b>6,342</b>	<b>4,934</b>	<b>4,611</b>	<b>1,451</b>	<b>39,254</b>
<b>SOUTH BAY AREA</b>													
<i>SWP Agencies</i>													
Alameda County Flood Control and Water Conservation District, Zone 7													
Table A	0	0	444	230	1,289	1,597	2,035	1,801	1,921	567	873	1,236	11,993
Table A Transfer to Kern-Delta Water Bank*	0	0	0	0	0	0	0	4,849	11,036	4,423	0	0	20,308
Pool A	0	0	0	0	0	0	0	0	0	179	0	0	179
Article 56(c) Carryover	191	1,909	2,417	2,579	2,849	3,497	2,848	605	195	1,714	1,553	0	20,357



**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

<b>Contracting Agency and Type of Service</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>2012 Total Deliveries</b>
Dry Purchase	0	0	0	0	0	0	0	0	0	402	0	0	402
Local	181	972	710	292	348	235	240	2,353	3,186	2,489	367	108	11,481
Transfer from Byron-Bethany Irrigation District	0	0	0	0	0	0	1,000	1,000	0	0	0	0	2,000
Agency Total (*excluded from total)	372	2,881	3,571	3,101	4,486	5,329	6,123	5,759	5,302	5,351	2,793	1,344	46,412
<b>Alameda County Water District</b>													
Table A	0	0	0	0	0	0	0	3	2,410	1,122	844	72	4,451
Table A Transfer to Kern Delta Water Bank*	0	0	0	0	0	0	7,500	0	0	0	0	0	7,500
Pool A	0	0	0	0	0	93	0	0	0	0	0	0	93
Article 56(c) Carryover	0	1,111	1,728	1,617	1,548	1,797	0	639	0	0	0	347	8,787
Local	0	0	0	0	0	0	2,068	1,665	0	1,000	200	19	4,952
Agency Total (*excluded from total)	0	1,111	1,728	1,617	1,548	1,890	2,068	2,307	2,410	2,122	1,044	438	18,283
<b>Santa Clara Valley Water District</b>													
Table A	0	0	0	853	8,481	8,073	6,665	3,361	3,170	1,837	688	1,484	34,612
Table A from Kern exchanged with Semitropic Recovery	0	0	0	0	0	0	2,000	5,000	5,000	5,000	0	0	17,000
Pool A	0	0	0	0	0	0	222	0	0	0	0	0	222
Article 14(b) Carryover	72	3,626	3,039	4,725	0	0	0	0	0	0	0	0	11,462
Dry Purchase	0	0	0	0	0	0	0	498	0	0	0	0	498
Agency Total	72	3,626	3,039	5,578	8,481	8,073	8,887	8,859	8,170	6,837	688	1,484	63,794
<b>Non-SWP Agencies</b>													
<b>Byron-Bethany Irrigation District</b>													
Regulated delivery of local supply	0	48	912	1,417	3,236	4,040	4,137	3,763	4,036	2,889	430	86	24,994
Recreation/Fish and Wildlife (SWP)													
Lake del Valle	4	3	3	8	18	20	28	26	21	13	3	3	150
SWP	267	6,649	7,631	10,012	14,185	15,077	13,798	11,435	12,717	10,432	3,961	3,142	109,306
Non-SWP	181	1,020	1,622	1,709	3,584	4,275	7,445	9,279	7,222	6,780	997	213	44,327
<b>South Bay Area Total</b>	<b>448</b>	<b>7,669</b>	<b>9,253</b>	<b>11,721</b>	<b>17,769</b>	<b>19,352</b>	<b>21,243</b>	<b>20,714</b>	<b>19,939</b>	<b>17,212</b>	<b>4,958</b>	<b>3,355</b>	<b>153,633</b>
<b>SAN JOAQUIN VALLEY AREA</b>													
<b>SWP Agencies</b>													
<b>County of Kings</b>													
Table A	0	0	0	0	0	0	2,668	0	0	0	0	0	2,668
Table A Point of Delivery through Westlands*	0	0	0	0	0	174	355	1,386	317	230	135	72	2,669
Pool A	0	0	0	1	0	0	9	0	0	0	0	0	10

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Total Deliveries
Pool A Point of Delivery through Westlands*	0	0	0	0	0	11	0	0	0	0	0	0	11
Article 56(c) Carryover Point of Delivery through Westlands*	102	86	145	177	316	1,170	0	1	1	1	1	1	2,001
Dry Purchase	0	0	0	0	0	0	0	20	1	0	0	0	21
Dry Purchase Point of Delivery through Westlands*	0	0	0	0	0	0	0	0	25	0	0	0	25
Agency Total (*excluded from total)	0	0	0	1	0	0	2,677	20	1	0	0	0	2,699
Dudley Ridge Water District													
Table A	140	962	1,000	0	0	0	1,324	2,724	0	623	309	14	7,096
Table A Transfer from Butte	0	0	0	0	0	0	0	1,382	0	0	0	0	1,382
Table A Transfer to Kern*	760	1,000	0	0	0	0	3,100	200	0	900	1,300	0	7,260
Table A Transfer from Tulare	0	0	0	0	0	0	2,800	0	0	0	0	0	2,800
Table A Exchange to San Gabriel*	0	0	0	0	0	0	0	0	0	0	1,636	1,702	3,338
Pool A	0	0	0	0	0	0	112	0	0	0	0	0	112
Article 56(c) Exchange from Santa Barbara	43	0	0	0	0	0	0	0	0	0	0	0	43
Kern Water Bank Recovery from Kern Water Bank	0	1,000	689	479	0	0	0	0	0	0	0	0	2,168
Dry Purchase	0	0	0	0	0	0	0	251	0	0	0	0	251
General Conveyance from Browns Valley Irrigation District	0	0	0	0	0	0	0	0	1,933	237	0	0	2,170
General Conveyance from storage	0	0	0	0	2,163	3,386	519	0	0	0	0	0	6,068
Agency Total (*excluded from total)	183	1,962	1,689	479	2,163	3,386	4,755	4,357	1,933	860	309	14	22,090
Empire West Side Irrigation District													
Table A	0	0	0	0	0	0	0	0	0	0	66	564	630
Table A Transfer to Westlands*	0	0	0	0	0	0	0	0	0	0	449	389	838
Article 12(e) Carryover	321	300	28	0	0	0	0	0	0	0	0	0	649
Article 12(e) Carryover Point of Delivery through Westlands*	0	0	125	0	0	0	0	0	0	0	0	0	125
Agency Total (*excluded from total)	321	300	28	0	0	0	0	0	0	0	66	564	1,279
Kern County Water Agency													
Table A	0	37,673	0	8,371	48,563	95,307	96,658	127,775	56,244	45,422	17,475	4,223	537,711
Table A to Western Hills Water District*	39	37	38	49	155	205	271	173	142	87	29	33	1,258
Table A from Alameda-Zone 7	0	0	0	0	0	0	0	4,849	11,036	4,423	0	0	20,308
Table A from Alameda County	0	0	0	0	0	0	7,500	0	0	0	0	0	7,500
Table A from Castaic Lake	0	0	0	0	0	2,000	5,000	3,000	0	0	0	0	10,000
Table A from Metropolitan	0	0	0	79	3,502	38,077	54,150	36,878	13,060	9,375	7,223	2,712	165,056

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Total Deliveries
Table A Transfer from Butte	0	0	0	0	0	0	0	8,258	0	0	0	0	8,258
Table A Transfer from Dudley Ridge	760	1,000	0	0	0	0	3,100	200	0	900	1,300	0	7,260
Table A Transfer from AVEK	0	0	0	0	0	3,700	11,991	8,888	3,104	4,817	1,011	0	33,511
Table A Transfer from Tulare	0	0	0	0	0	0	7,200	1,800	0	0	1,000	0	10,000
Table A Exchange of AVEK water with Metropolitan sent to Kern	0	0	0	0	0	0	0	1,953	0	0	0	3,047	5,000
Table A Exchange with Palmdale	0	0	0	0	0	0	0	2,500	0	0	0	0	2,500
Table A Exchange with Castaic Lake	0	0	0	0	0	0	0	0	5,500	0	0	0	5,500
Table A to Santa Clara exchanged with Semitropic Recovery	0	0	0	0	0	0	2,000	5,000	5,000	5,000	0	0	17,000
Pool A	0	0	0	0	2,180	0	0	0	0	0	0	0	2,180
Article 56(c) Carryover	24,208	0	0	7,018	1,251	0	0	0	0	0	0	0	32,477
Article 56(c) from San Bernardino	12,530	9,404	0	0	0	0	0	0	0	0	0	0	21,934
Pump Recovery within service area	0	0	22,465	21,901	22,413	18,854	0	0	0	0	0	7,317	92,950
Kern Water Bank Recovery to Dudley Ridge	0	1,000	689	479	0	0	0	0	0	0	0	0	2,168
Arvin-Edison Water Bank Recovery to Metropolitan	0	0	6,495	3,425	90	0	0	0	0	0	0	0	10,010
Dry Purchase	0	0	0	0	0	0	0	0	0	0	4,895	0	4,895
Transfer from Reclamation	3,028	12,000	0	0	0	0	0	0	0	0	2,500	586	18,114
General Conveyance from City of Tracy	0	4,000	0	0	0	0	0	0	2,000	0	0	0	6,000
General Conveyance from Kern-Tulare	12,846	2,154	0	0	0	0	0	0	8,056	12,264	0	0	35,320
General Conveyance to Coachella	0	0	0	0	0	0	0	1,000	1,000	1,000	1,000	0	4,000
Water Operations exchange from County of Fresno	0	0	0	473	3,870	0	0	0	0	0	0	0	4,343
Agency Total (*excluded from total)	53,372	66,231	22,465	37,842	81,779	157,938	185,599	196,101	99,000	77,201	35,404	17,885	1,030,817
Oak Flat Water District													
Table A	0	0	0	0	319	504	543	707	389	117	17	0	2,596
Article 56(c) Carryover	46	127	59	122	0	75	91	92	0	0	0	0	612
Agency Total	46	127	59	122	319	579	634	799	389	117	17	0	3,208
Tulare Lake Basin Water Storage District													
Table A	0	0	0	226	0	539	11,006	24,171	433	280	836	39	37,530
Table A Transfer to Kern*	0	0	0	0	0	0	7,200	1,800	0	0	1,000	0	10,000
Table A Transfer to Westlands*	0	0	0	0	0	2,800	0	500	0	0	0	0	3,300
Table A Transfer to Dudley Ridge*	0	0	0	0	0	0	2,800	0	0	0	0	0	2,800
Pool A	0	0	0	20	0	0	177	0	0	0	0	0	197
Article 56(c) Carryover	13,437	2,085	1,107	55	1,729	6,052	7,616	0	0	0	0	0	32,081
Dry Purchase	0	0	0	0	0	0	0	443	0	0	0	0	443

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

<b>Contracting Agency and Type of Service</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>2012 Total Deliveries</b>
Transfer from Reclamation	0	0	0	0	0	4,600	0	3,700	0	0	0	0	8,300
General Conveyance from Reclamation	0	0	0	0	0	0	0	0	632	277	141	16	1,066
Agency Total (*excluded from total)	13,437	2,085	1,107	301	1,729	11,191	18,799	28,314	1,065	557	977	55	79,617
<i>Recreation/Fish and Wildlife (SWP)</i>													
Department of Parks and Recreation, Cattle	1	0	1	0	0	0	0	0	0	0	0	0	2
Department of Fish and Wildlife, O'Neill	48	17	29	5	55	121	69	63	62	3	0	33	505
Department of Fish and Wildlife, Lateral 4	0	0	0	0	1	0	1	0	1	1	0	0	4
Department of Parks and Recreation, O'Neill	0	0	0	0	1	0	0	0	1	1	0	0	3
Department of Parks and Recreation, San Luis	0	0	1	0	1	0	1	0	0	1	0	0	4
Agency Total	49	17	31	5	58	121	71	63	64	6	0	33	518
<i>Non-SWP Agencies</i>													
<i>Cross Valley Canal Contractors</i>													
Fresno County Public Works	2,400	0	0	0	0	0	0	0	456	744	0	0	3,600
Hills Valley Irrigation District	0	0	0	0	0	0	0	0	513	825	0	0	1,338
County of Tulare	0	0	0	0	0	0	0	0	817	1,306	0	0	2,123
Kern-Tulare Water District	580	848	0	0	0	0	0	0	0	0	0	0	1,428
Tri-Valley Water District	0	0	0	0	0	0	0	0	171	286	0	0	457
Agency Total	2,980	848	0	0	0	0	0	0	1,957	3,161	0	0	8,946
<i>CVP Water Annual Contractors</i>													
Plain View/Musco Family Olive Company	28	37	46	56	53	56	61	38	12	52	59	28	526
U.S. Department of Veterans Affairs, San Joaquin Valley National Cemetery	5	10	4	14	41	38	50	50	30	15	8	3	268
Agency Total	33	47	50	70	94	94	111	88	42	67	67	31	794
<i>Bureau of Reclamation</i>													
<i>Western Hills Water District</i>													
Table A Point of Delivery from Kern	39	37	38	49	155	205	271	173	142	87	29	33	1,258
<i>Westlands Water District</i>													
Table A Point of Delivery from Kings	0	0	0	0	0	174	355	1,386	317	230	135	72	2,669
Table A Transfer from Empire	0	0	0	0	0	0	0	0	0	0	449	389	838
Table A Transfer from Tulare	0	0	0	0	0	2,800	0	500	0	0	0	0	3,300
Pool A from Kings	0	0	0	0	0	11	0	0	0	0	0	0	11
Article 56(c) from Kings	102	86	145	177	316	1,170	0	1	1	1	1	1	2,001
Dry Purchase through Kings	0	0	0	0	0	0	0	0	25	0	0	0	25
Article 12(e) Carryover from Empire*	0	0	125	0	0	0	0	0	0	0	0	0	125
Westlands Agency Total (*excluded from total)	102	86	270	177	316	4,155	355	1,887	343	231	585	462	8,969

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

<b>Contracting Agency and Type of Service</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>2012 Total Deliveries</b>
Reclamation Dry Purchase	0	0	0	0	0	0	0	12,134	8,446	0	0	0	20,580
San Luis & Delta Mendota Water Authority Dry Purchase	0	0	0	0	0	0	0	5,929	1,507	0	0	0	7,436
Reclamation Transfer to Kern*	3,028	12,000	0	0	0	0	0	0	0	0	2,500	586	18,114
Reclamation Transfer to Tulare*	0	0	0	0	0	4,600	0	3,700	0	0	0	0	8,300
General Conveyance to Tulare*	0	0	0	0	0	0	0	0	632	277	141	16	1,066
Kern National Wildlife Refuge	1,585	1,609	0	0	400	0	0	0	3,575	5,128	3,337	3,112	18,746
Recreation	0	3	0	2	0	1	0	1	0	0	0	0	7
Fish and Wildlife	40	14	22	5	45	96	57	52	51	3	0	27	412
Agency Total (*excluded from total)	1,766	1,712	292	184	761	4,252	412	20,003	13,922	5,362	3,922	3,601	56,150
<i>SWP</i>	51,675	52,691	25,687	38,503	80,486	169,589	212,642	227,300	90,290	66,281	29,851	18,444	1,063,439
<i>Non-SWP</i>	7,666	14,521	72	77	539	4,791	168	22,618	16,236	8,636	10,940	3,772	90,036
<b>San Joaquin Valley Area Total</b>	<b>72,187</b>	<b>73,366</b>	<b>25,759</b>	<b>39,053</b>	<b>87,058</b>	<b>177,766</b>	<b>213,329</b>	<b>249,918</b>	<b>118,515</b>	<b>87,418</b>	<b>40,791</b>	<b>22,216</b>	<b>1,207,376</b>
<b>CENTRAL COASTAL AREA</b>													
<i>SWP Agencies</i>													
San Luis Obispo County Flood Control and Water Conservation District													
Table A	0	0	0	285	368	409	431	407	383	417	80	331	3,111
Article 56(c) Carryover	235	297	301	0	0	0	0	0	0	0	0	0	833
Agency Total	235	297	301	285	368	409	431	407	383	417	80	331	3,944
Santa Barbara County Flood Control and Water Conservation District													
Table A	1,083	970	1,241	1,330	2,074	2,330	2,438	2,559	2,401	1,805	459	784	19,474
Table A Exchange from Metropolitan	0	0	0	0	0	0	0	547	0	0	0	853	1,400
Article 56(c) Exchanged with Dudley Ridge*	43	0	0	0	0	0	0	0	0	0	0	0	43
Agency Total (*excluded from total)	1,083	970	1,241	1,330	2,074	2,330	2,438	3,106	2,401	1,805	459	1,637	20,874
<i>SWP</i>	1,318	1,267	1,542	1,615	2,442	2,739	2,869	3,513	2,784	2,222	539	1,968	24,818
<i>Non-SWP</i>	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Central Coastal Area Total</b>	<b>1,318</b>	<b>1,267</b>	<b>1,542</b>	<b>1,615</b>	<b>2,442</b>	<b>2,739</b>	<b>2,869</b>	<b>3,513</b>	<b>2,784</b>	<b>2,222</b>	<b>539</b>	<b>1,968</b>	<b>24,818</b>
<b>SOUTHERN CALIFORNIA AREA</b>													
<i>SWP Agencies</i>													
Antelope Valley-East Kern Water Agency													
Table A	0	0	0	2,330	3,356	2,126	4,668	9,226	9,714	6,165	2,504	2,094	42,183
Table A Point of Delivery through Mojave	0	0	0	0	0	221	0	153	187	76	42	16	695



**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Total Deliveries
Table A Transfer to Kern*	0	0	0	0	0	3,700	11,991	8,888	3,104	4,817	1,011	0	33,511
Table A Exchange to Metropolitan*	0	0	0	0	0	0	0	1,953	0	0	0	3,047	5,000
Article 56(c) Carryover Point of Delivery through Mojave	15	59	110	127	121	0	179	0	0	0	0	0	611
Article 56(c) Carryover	4,547	4,832	5,014	2,296	4,016	5,820	5,448	881	0	0	0	0	32,854
Article 56(c) Exchanged with Palmdale	2,659	0	0	0	0	0	0	0	0	0	0	0	2,659
Agency Total (*excluded from total)	7,221	4,891	5,124	4,753	7,493	8,167	10,295	10,260	9,901	6,241	2,546	2,110	79,002
Castaic Lake Water Agency													
Table A	0	266	886	726	376	3,994	4,401	5,013	4,170	3,625	2,508	1,242	27,207
Table A to Kern*	0	0	0	0	0	2,000	5,000	3,000	0	0	0	0	10,000
Table A Exchange with Kern*	0	0	0	0	0	0	0	0	5,500	0	0	0	5,500
Article 56(c) Carryover	2,382	1,531	1,926	2,011	3,500	0	0	0	0	0	0	0	11,350
Agency Total (*excluded from total)	2,382	1,797	2,812	2,737	3,876	3,994	4,401	5,013	4,170	3,625	2,508	1,242	38,557
Coachella Valley Water District													
Table A	0	0	0	0	0	1,000	13,140	15,219	14,912	15,219	15,219	15,219	89,928
Pool A	0	0	0	0	0	0	0	0	307	0	0	0	307
Article 56(c) Carryover	16,674	5,989	0	0	0	0	0	0	0	0	0	0	22,663
Dry Purchase	0	0	0	0	0	0	0	0	0	0	689	0	689
General Conveyance from Kern	0	0	0	0	0	0	0	1,000	1,000	1,000	1,000	0	4,000
Agency Total	16,674	5,989	0	0	0	1,000	13,140	16,219	16,219	16,219	16,908	15,219	117,587
Crestline-Lake Arrowhead Water Agency													
Table A	41	47	0	0	0	0	21	144	160	101	57	53	624
Local	0	0	41	21	52	105	116	0	0	0	0	0	335
Agency Total	41	47	41	21	52	105	137	144	160	101	57	53	959
Desert Water Agency													
Table A	0	0	0	0	0	0	5,697	6,133	6,009	6,133	6,133	6,133	36,238
Pool A	0	0	0	0	0	0	0	0	124	0	0	0	124
Article 56(c) Carryover	6,048	2,413	0	0	0	0	0	0	0	0	0	0	8,461
Dry Purchase	0	0	0	0	0	0	0	0	0	0	278	0	278
Agency Total	6,048	2,413	0	0	0	0	5,697	6,133	6,133	6,133	6,411	6,133	45,101
The Metropolitan Water District of Southern California													
Table A	15,932	32,725	15,662	58,229	135,906	123,857	102,542	96,029	74,797	106,083	85,221	24,026	871,009
Table A to Kern*	0	0	0	79	3,502	38,077	54,150	36,878	13,060	9,375	7,223	2,712	165,056
Table A to Mojave*	0	0	0	0	0	446	977	925	1,223	3,867	6,139	1,442	15,019
Table A Transfer from San Bernardino	0	0	0	0	0	0	0	0	20,000	30,000	0	0	50,000
Table A Exchange to Santa Barbara	0	0	0	0	0	0	0	547	0	0	0	853	1,400

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

<b>Contracting Agency and Type of Service</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>2012 Total Deliveries</b>
Table A Exchange from AVEK sent to Kern*	0	0	0	0	0	0	0	1,953	0	0	0	3,047	5,000
Pool A	0	0	0	0	0	0	0	0	4,241	0	0	0	4,241
Article 56(c) Carryover	0	0	16,097	25,488	1,103	0	0	0	0	0	0	0	42,688
Article 56(c) Carryover	55,904	0	7,802	7,537	4,241	0	0	0	0	0	0	0	75,484
Recovery from Arvin-Edison Water Bank	0	0	6,495	3,425	90	0	0	0	0	0	0	0	10,010
Flexible Withdrawal from Castaic Lake	0	0	19,441	15,559	0	0	0	0	0	0	0	0	35,000
Agency Total (*excluded from total)	71,836	32,725	65,497	110,238	141,340	123,857	102,542	96,029	99,038	136,083	85,221	24,026	1,088,432
<b>Mojave Water Agency</b>													
Table A	0	0	0	0	0	1,011	0	571	847	459	455	634	3,977
Table A from Metropolitan	0	0	0	0	0	446	977	925	1,223	3,867	6,139	1,442	15,019
Table A Point of Delivery through AVEK*	0	0	0	0	0	221	0	153	187	76	42	16	695
Article 56(c) Carryover	1,529	1,230	922	876	980	0	424	0	0	0	0	0	5,961
Article 56(c) Carryover through AVEK*	15	59	110	127	121	0	179	0	0	0	0	0	611
Agency Total (*excluded from total)	1,529	1,230	922	876	980	1,457	1,401	1,496	2,070	4,326	6,594	2,076	24,957
<b>Palmdale Water District</b>													
Table A	0	0	516	797	1,360	1,817	2,117	802	0	0	0	50	7,459
Table A Transfer from Butte	0	0	0	0	0	0	0	1,325	1,865	1,633	1,077	961	6,861
Table A Exchange to Kern*	0	0	0	0	0	0	0	2,500	0	0	0	0	2,500
Article 56(c) Carryover	1,375	598	104	0	0	0	0	0	0	0	0	0	2,077
Article 56(c) Exchanged with AVEK*	2,659	0	0	0	0	0	0	0	0	0	0	0	2,659
Agency Total (*excluded from total)	1,375	598	620	797	1,360	1,817	2,117	2,127	1,865	1,633	1,077	1,011	16,397
<b>San Bernardino Valley Municipal Water District</b>													
Table A	0	0	0	0	1,050	475	1,429	4,187	5,058	2,065	0	838	15,102
Table A Transfer to Metropolitan*	0	0	0	0	0	0	0	0	20,000	30,000	0	0	50,000
Article 56(c) Carryover	919	1,038	1,730	1,968	1,814	3,500	3,500	1,000	1,000	2,726	4,277	2,464	25,936
Article 56(c) Carryover to Kern*	12,530	9,404	0	0	0	0	0	0	0	0	0	0	21,934
Agency Total (*excluded from total)	919	1,038	1,730	1,968	2,864	3,975	4,929	5,187	6,058	4,791	4,277	3,302	41,038
<b>San Gabriel Valley Municipal Water District</b>													
Table A	0	0	0	179	3,410	2,859	2,936	2,919	2,885	3,455	77	0	18,720
Table A Exchange from Dudley Ridge	0	0	0	0	0	0	0	0	0	0	1,636	1,702	3,338
Agency Total	0	0	0	179	3,410	2,859	2,936	2,919	2,885	3,455	1,713	1,702	22,058
<b>San Geronio Pass Water Agency</b>													
Table A	0	0	650	0	646	596	618	518	592	613	743	992	5,968
Article 56(c) Carryover	1,021	0	457	993	376	376	376	376	376	376	229	0	4,956
Dry Purchase	0	0	0	0	0	0	0	86	0	0	0	0	86
Agency Total	1,021	0	1,107	993	1,022	972	994	980	968	989	972	992	11,010

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Total Deliveries
<b>Ventura County Flood Control District</b>													
Table A	0	0	0	0	0	0	0	0	301	301	3,451	300	4,353
Agency Total	0	0	0	0	0	0	0	0	301	301	3,451	300	4,353
<b>Recreation/Fish and Wildlife (SWP)</b>													
Castaic Lagoon	40	43	43	43	33	26	30	33	25	31	19	9	375
Lake Perris	8	9	11	12	24	36	29	32	25	7	11	3	207
Lake Perris	3	13	16	17	21	27	35	43	39	9	21	8	252
Pyramid Lake	1	1	0	1	1	2	1	1	2	1	0	2	13
Silverwood Lake	2	2	2	3	8	12	12	15	12	14	7	2	91
Agency Total	54	68	72	76	87	103	107	124	103	62	58	24	938
<i>SWP</i>	109,100	50,796	77,884	122,617	162,432	148,201	148,580	145,545	148,871	182,959	129,826	58,190	1,485,001
<i>Non-SWP</i>	0	0	41	21	52	105	116	86	0	0	967	0	1,388
<b>Southern California Area Total</b>	<b>109,100</b>	<b>50,796</b>	<b>77,925</b>	<b>122,638</b>	<b>162,484</b>	<b>148,306</b>	<b>148,696</b>	<b>146,631</b>	<b>149,871</b>	<b>183,959</b>	<b>131,793</b>	<b>58,190</b>	<b>1,490,389</b>
<b>SWP WATER</b>													
<i>SWP Long-term Water Supply Contracts</i>													
Table A	17,255	72,758	20,419	73,574	207,332	246,868	262,968	306,952	189,832	198,563	139,875	61,533	1,797,929
Transfer Table A	799	1,037	38	128	3,667	47,410	93,350	69,574	50,757	55,332	18,363	5,609	346,064
Exchange Table A	0	0	0	0	0	0	2,000	10,000	10,500	5,000	1,636	5,602	34,738
Pool Water	0	0	0	21	2,180	104	520	0	4,672	179	0	64	7,740
Article 12(e) Carryover	321	300	153	0	0	0	0	0	0	0	0	0	774
Article 56(c) Carryover	146,297	36,612	43,149	57,890	25,184	26,507	25,084	7,907	4,634	7,834	8,417	3,146	392,661
Agency Total	164,672	110,707	63,759	131,613	238,363	320,889	383,922	394,433	260,395	266,908	168,291	75,954	2,579,906
<i>Other Water Supply Contracts</i>													
Article 21	0	0	105	89	633	200	0	0	0	0	0	0	1,027
Flexible Storage Withdrawal	0	0	19,441	15,559	0	0	0	0	0	0	0	0	35,000
Solano Settlement	0	0	0	0	0	800	900	0	600	0	0	0	2,300
<b>SWP Total</b>	<b>164,672</b>	<b>110,707</b>	<b>83,305</b>	<b>147,261</b>	<b>238,996</b>	<b>321,889</b>	<b>384,822</b>	<b>394,433</b>	<b>260,995</b>	<b>266,908</b>	<b>168,291</b>	<b>75,954</b>	<b>2,618,233</b>
<b>NON-SWP WATER</b>													
<i>Non-SWP Water to SWP Contractors</i>													
Water Bank Recovery	0	1,000	29,649	25,805	22,503	18,854	0	0	0	0	0	7,317	105,128
Recreation/Fish and Wildlife	0	0	1	0	0	1	0	0	1	0	0	0	3

**Table 9-8 Total Amounts of Water Delivered in 2012, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2012 Total Deliveries
2012 Dry Year Purchase Program	0	0	0	0	0	0	0	1,298	26	402	5,862	0	7,588
Local	181	972	751	313	400	340	2,424	4,018	3,305	3,501	567	127	16,899
Vallejo Permit	2	18	2	0	7	3	205	205	105	3	448	1	999
Water Transfer	3,028	12,000	0	0	0	4,600	1,000	4,700	0	0	2,500	586	28,414
Conveyance	12,846	6,154	0	0	2,163	3,386	519	1,000	13,621	13,778	1,141	16	54,624
Water Operations Exchange	0	0	0	473	3,870	0	0	0	0	0	0	0	4,343
<i>Subtotal</i>	<i>16,057</i>	<i>20,144</i>	<i>30,403</i>	<i>26,591</i>	<i>28,943</i>	<i>27,184</i>	<i>4,148</i>	<i>11,221</i>	<i>17,058</i>	<i>17,684</i>	<i>10,518</i>	<i>8,047</i>	<i>217,998</i>
<b>Total Deliveries to SWP Contractors</b>	<b>180,729</b>	<b>130,851</b>	<b>113,708</b>	<b>173,852</b>	<b>267,939</b>	<b>349,073</b>	<b>388,970</b>	<b>405,654</b>	<b>278,053</b>	<b>284,592</b>	<b>178,809</b>	<b>84,001</b>	<b>2,836,231</b>
<b>Non-SWP Water Supply Contracts</b>													
Local	44,493	227	1,973	3,099	157,031	169,622	193,456	169,940	73,592	70,489	122,803	65,970	1,072,695
Recreation/Fish and Wildlife	107	88	106	89	163	244	206	213	188	81	61	60	1,606
CVP/Reclamation													
Cross Valley Canal Contractors	2,980	848	0	0	0	0	0	0	1,957	3,161	0	0	8,946
Kern National Wildlife Refuge	1,585	1,609	0	0	400	0	0	0	3,575	5,128	3,337	3,112	18,746
Recreation/Fish and Wildlife	40	17	22	7	45	97	57	53	51	3	0	27	419
Annual Contract	33	47	50	70	94	94	111	88	42	67	67	31	794
2012 Dry Year Purchase Program	0	0	0	0	0	0	0	18,063	9,953	0	0	0	28,016
<i>Subtotal</i>	<i>49,238</i>	<i>2,836</i>	<i>2,151</i>	<i>3,265</i>	<i>157,733</i>	<i>170,057</i>	<i>193,830</i>	<i>188,357</i>	<i>89,358</i>	<i>78,929</i>	<i>126,268</i>	<i>69,200</i>	<i>1,131,222</i>
<b>Non-SWP Total</b>	<b>65,295</b>	<b>22,980</b>	<b>32,554</b>	<b>29,856</b>	<b>186,676</b>	<b>197,241</b>	<b>197,978</b>	<b>199,578</b>	<b>106,416</b>	<b>96,613</b>	<b>136,786</b>	<b>77,247</b>	<b>1,349,220</b>
<b>Grand Total</b>	<b>229,967</b>	<b>133,687</b>	<b>115,859</b>	<b>177,117</b>	<b>425,672</b>	<b>519,130</b>	<b>582,800</b>	<b>594,011</b>	<b>367,411</b>	<b>363,521</b>	<b>305,077</b>	<b>153,201</b>	<b>3,967,453</b>

**Table 9-9 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2012 (acre-feet)**

Year	Annual Table A Amounts According to Long-term Water Supply Contracts							Water Conveyed									Total (16)
	Upper Feather River Area (1)	North Bay Area (2)	South Bay Area (3)	San Joaquin Valley Area (4)	Central Coastal Area (5)	Southern California Area (6)	Total (7)	Deliveries					Initial Fill Water (14)	Losses and Storage Changes <sup>d</sup> (15)			
								Table A Water (8)	Article 21, Surplus, and Unscheduled Water <sup>a</sup> (9)	Other Water <sup>b</sup> (10)	Feather River Diversions <sup>c</sup> (11)	Recreation/ Fish and Wildlife/ Recreation Water (12)			Subtotal (13)		
1962	0	0	0	0	0	0	0	0	0	18,289	0	0	18,289	9	272	18,570	
1963	0	0	0	0	0	0	0	0	0	22,456	0	0	22,456	71	185	22,712	
1964	0	0	0	0	0	0	0	0	0	32,507	0	0	32,507	171	152	32,830	
1965	0	0	0	0	0	0	0	0	0	44,105	0	0	44,105	93	729	44,927	
1966	0	0	0	0	0	0	0	0	0	67,928	0	0	67,928	0	1,746	69,674	
1967	0	0	11,538	0	0	0	11,538	11,538	0	53,605	0	0	65,143	8,328	4,212	77,683	
1968	550	0	109,900	77,350	0	3,700	191,500	171,709	121,534	14,777	866,926	0	1,174,946	498,926	117,906	1,791,778	
1969	620	0	98,700	163,075	0	5,000	267,395	193,020	72,397	18,829	794,374	0	1,078,620	510,614	72,196	1,661,430	
1970	700	0	114,200	202,000	0	5,700	322,600	233,993	133,024	38,080	759,759	0	1,164,856	23,947	2,435	1,191,238	
1971	890	0	116,200	251,800	0	6,700	375,590	357,340	296,019	44,119	778,362	8	1,475,848	7,853	5,812	1,489,513	
1972	970	0	118,300	413,066	0	209,423	741,759	611,801	423,964	66,638	817,398	6,489	1,926,290	100,274	53,062	2,079,626	
1973	1,100	0	120,400	383,652	0	481,100	986,252	694,388	296,416	42,511	800,743	1,155	1,835,213	204,638	53,798	2,093,649	
1974	1,230	0	122,400	460,650	0	597,920	1,182,200	874,077	417,676	46,224	911,613	2,118	2,251,708	237,554	10,657	2,499,919	
1975	1,610	0	124,500	545,809	0	714,950	1,386,869	1,223,990	622,902	63,793	862,218	3,377	2,776,280	103,352	(94,606)	2,785,026	
1976	1,990	0	126,500	543,417	0	836,480	1,508,387	1,373,002	580,110	115,217	946,440	1,745	3,016,514	61,122	(681,025)	2,396,611	
1977	2,420	0	128,600	581,400	0	954,901	1,667,321	574,155	0	389,065	581,994	1,111	1,546,325	0	(131,151)	1,415,174	
1978	1,850	0	130,700	635,900	0	1,049,584	1,818,034	1,452,699	16,914	121,225	786,517	1,691	2,379,046	64,443	717,370	3,160,859	
1979	2,130	0	132,700	702,685	0	1,190,573	2,028,088	1,659,896	648,389	187,630	882,549	1,766	3,380,230	12,302	(83,430)	3,309,102	
1980	1,810	500	134,800	758,100	1,946	1,317,614	2,214,770	1,529,749	404,557	46,459	875,045	2,131	2,857,941	0	(26,606)	2,831,335	
1981	1,940	650	137,000	818,000	2,813	1,432,065	2,392,468	1,909,562	908,428	279,161	838,557	4,688	3,940,396	0	(802,263)	3,138,133	
1982	1,970	800	139,200	876,500	5,626	1,550,449	2,574,545	1,750,024	215,873	154,882	776,330	4,646	2,901,755	0	480,752	3,382,507	
1983	2,000	950	141,400	867,118	8,439	1,681,257	2,701,164	1,184,869	13,019	181,453	602,905	7,849	1,990,095	0	(90,997)	1,899,098	
1984	3,630	1,100	143,600	979,211	12,698	1,744,098	2,884,337	1,588,619	262,917	381,024	832,332	7,040	3,071,932	0	(140,182)	2,931,750	
1985	3,760	1,250	145,800	1,019,049	21,138	1,864,849	3,055,846	1,995,453	307,672	404,842	870,008	4,033	3,582,008	0	92,885	3,674,893	
1986	4,190	1,400	148,100	1,091,946	28,210	1,983,890	3,257,736	1,995,636	36,620	193,606	791,737	3,865	3,021,464	0	284,380	3,305,844	
1987	4,620	1,550	150,300	1,188,500	35,204	2,103,941	3,484,115	2,130,086	114,907	377,592	831,947	7,672	3,462,204	0	(390,413)	3,071,791	
1988	5,060	15,471	152,500	1,246,100	43,722	2,225,482	3,688,335	2,385,122	0	507,076	794,834	4,889	3,691,921	0	(92,850)	3,599,071	
1989	5,500	24,615	156,700	1,290,400	56,342	2,424,633	3,958,190	2,853,747	0	474,559	830,500	8,135	4,166,941	0	447,917	4,614,858	
1990	6,040	28,190	160,900	1,313,450	70,486	2,500,600	4,079,666	2,582,151	90	424,697	875,099	9,262	3,891,299	0	(528,869)	3,362,430	
1991	11,880	29,590	166,400	1,338,011	70,486	2,510,200	4,126,567	549,113	3,521	551,051	565,395	4,879	1,673,959	0	167,435	1,841,394	



**Table 9-9 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2012 (acre-feet)**

Year	Annual Table A Amounts According to Long-term Water Supply Contracts							Water Conveyed								Total (16)
								Deliveries						Initial Fill Water (14)	Losses and Storage Changes <sup>d</sup> (15)	
	Upper Feather River Area (1)	North Bay Area (2)	South Bay Area (3)	San Joaquin Valley Area (4)	Central Coastal Area (5)	Southern California Area (6)	Total (7)	Table A Water (8)	Article 21, Surplus, and Unscheduled Water <sup>a</sup> (9)	Other Water <sup>b</sup> (10)	Feather River Diversions <sup>c</sup> (11)	Recreation/ Fish and Wildlife Water (12)	Subtotal (13)			
1992	11,920	32,010	171,900	1,342,300	70,486	2,510,200	4,138,816	1,471,454	1,156	144,789	613,978	2,605	2,233,982	0	(63,541)	2,170,441
1993	11,960	34,620	177,400	1,342,300	70,486	2,510,200	4,146,966	2,315,235	0	254,854	822,589	2,609	3,395,287	0	726,123	4,121,410
1994	12,000	37,215	182,000	1,342,300	70,486	2,510,200	4,154,201	1,749,351	112,625	236,739	874,018	8,200	2,980,933	0	(295,405)	2,685,528
1995	12,050	44,030	184,000	1,342,300	70,486	2,510,200	4,163,066	1,967,093	64,330	78,425	860,077	2,575	2,972,500	0	69,536	3,042,036
1996	12,100	48,225	186,000	1,301,630	70,486	2,492,900	4,111,341	2,514,825	28,647	251,391	934,997	3,907	3,733,767	86	491,550	4,225,403
1997	12,150	49,315	188,000	1,297,300	45,201	2,492,900	4,084,866	2,325,775	21,432	322,000	993,211	4,146	3,666,564	527	(11,806)	3,655,285
1998	12,200	50,420	188,000	1,272,300	45,201	2,517,900	4,086,021	1,725,519	20,288	134,682	872,738	2,108	2,755,335	0	(132,491)	2,622,844
1999	12,250	51,500	188,000	1,272,300	70,486	2,519,900	4,114,436	2,738,891	158,070	85,312	1,108,672	4,324	4,095,269	0	(189,525)	3,905,744
2000	14,000	55,945	210,000	1,205,300	70,486	2,565,900	4,121,631	3,200,677	308,785	332,654	1,085,886	4,030	4,932,032	0	(20,103)	4,911,929
2001	14,670	66,561	220,000	1,185,519	70,486	2,566,900	4,124,136	1,690,926	43,435	477,835	1,078,656	2,929	3,293,781	0	159,983	3,453,764
2002	14,730	67,396	220,000	1,195,219	70,486	2,557,200	4,125,031	2,573,030	37,165	307,162	1,132,938	3,694	4,053,989	0	80,709	4,134,698
2003	14,790	68,231	220,400	1,194,819	70,486	2,558,200	4,126,926	2,901,041	59,828	251,447	1,008,093	2,846	4,223,255	0	459,377	4,682,632
2004	13,100	69,056	222,619	1,182,700	70,486	2,569,100	4,127,061	2,599,536	218,496	385,088	1,174,672	2,865	4,380,657	0	108,840	4,489,497
2005	10,800	69,481	222,619	1,170,000	70,486	2,582,300	4,125,686	2,828,406	731,083	96,932	1,074,706	1,506	4,732,633	0	529,347	5,261,980
2006	11,124	69,856	222,619	1,170,000	70,486	2,582,800	4,126,885	2,973,351	621,339	119,403	1,112,551	1,936	4,828,580	0	(119,981)	4,708,599
2007	11,520	70,231	222,619	1,170,000	70,486	2,584,450	4,129,306	2,081,217	309,973	449,935	1,217,990	2,581	4,061,696	0	(524,851)	3,536,845
2008	39,120	70,606	222,619	1,170,000	70,486	2,593,100	4,165,931	1,234,240	2,729	488,818	1,109,563	2,778	2,838,128	0	(758,813)	2,079,315
2009	39,190	70,981	222,619	1,170,000	70,486	2,593,100	4,166,376	1,232,753	6,032	527,207	1,149,291	2,047	2,918,189	0	(31,319)	2,886,870
2010	39,260	76,531	222,619	1,140,000	70,486	2,623,100	4,171,996	1,930,929	7,505	559,553	1,005,986	1,167	3,505,140	0	461,751	3,966,891
2011	39,340	76,581	222,619	1,140,000	70,486	2,623,100	4,172,126	2,847,572	420,814	332,277	1,028,542	1,593	4,630,798	0	358,354	4,989,152
2012	39,600	76,731	222,619	1,140,000	70,486	2,623,100	4,172,536	2,579,906	1,027	337,079	1,047,832	1,609	3,967,453	0	(537,209)	3,430,244
<b>Total</b>	<b>466,334</b>	<b>1,361,588</b>	<b>7,570,609</b>	<b>43,493,476</b>	<b>1,786,746</b>	<b>83,081,859</b>	<b>137,760,612</b>	<b>79,367,466</b>	<b>9,071,708</b>	<b>11,537,841</b>	<b>40,580,568</b>	<b>150,604</b>	<b>140,708,187</b>	<b>1,834,310</b>	<b>212,035</b>	<b>142,754,532</b>

<sup>a</sup> Values include amounts of deliveries to short-term contractors (Mustang Water District, 1970–1972; Tracy Golf and Country Club, 1974, 1979, and 1980; Green Valley Water District, 1974, 1975, 1978, 1979, 1980, and 1985; and Granite Construction Company, 1980).

<sup>b</sup> Includes amounts of SWP and non-SWP water conveyed for SWP and non-SWP water contractors.

<sup>c</sup> Includes amounts of water diverted under various water rights agreements.

<sup>d</sup> Amounts reflect net effect of (1) operational losses from SWP transportation facilities; (2) changes in reservoir storage south of the Delta; (3) storable local inflows to SWP reservoirs; (4) side inflow to San Luis Canal; and (5) inflow into the California Aqueduct from the Kern River Intertie.





## Chapter 10 Power Resources

*Devil Canyon Powerplant on the East Branch of the State Water Project.*



## Significant Events in 2012

The Western Electricity Coordinating Council (WECC) completed its first audit of the Department of Water Resources (DWR) for compliance with the North American Electric Reliability Corporation (NERC) standards in February 2012.

In May 2012, the DWR CEQA (California Environmental Quality Act) Climate Change Committee oversaw the completion of DWR's Climate Action Plan (CAP) Phase I: Greenhouse Gas Emissions (GHG) Reduction Plan that established DWR's GHG strategy.

DWR also procured GHG compliance instruments to meet its compliance and contractual obligations under the Cap and Trade Program administered by the California Air Resources Board.

Energy used at the 29 State Water Project (SWP) pumping and generating plants totaled 7.41 million megawatt hours (MWh). To meet the energy needs of the SWP, DWR purchased 2.47 million MWh of energy at a cost of \$30.92 million after a total CAISO purchase offset of \$51 million.

DWR purchased 2.14 million MWh of short-term energy under the WSPP agreement from 10 WSPP marketers and 2 public electric utilities at a cost of \$21.95 million.

Pursuant to its excess power sales agreements, DWR sold 532,800 MWh of energy to three electric utilities and four WSPP power marketers totaling \$15.93 million in revenues.

*Information for this chapter was provided by the State Water Project Analysis Office, the SWP Power and Risk Office, and the Hydropower License Planning and Compliance Office.*

Long-term State Water Project (SWP) water contractors depend on the SWP to obtain economical sources of power in order to deliver affordable water. Consequently, the Department of Water Resources (DWR) administers a comprehensive power resources program. Key elements of the program include studies of power resources for future needs, acquisition of long-term power resources and transmission services, short-term purchases or sales of power, and the strategic operation of generation and pumping facilities.

## Power Resources Program

The goals of the SWP power resources program are to:

- obtain reliable, environmentally sensitive, and competitively priced power resources and transmission services sufficient to operate the SWP;
- develop and manage power resources to minimize the cost of water deliveries to SWP water contractors;
- meet responsibilities and criteria of the Western Electricity Coordinating Council (WECC); and
- conform to regulations of the Federal Energy Regulatory Commission (FERC).

To achieve these goals, DWR constructed its own power facilities and enters into long-term contracts and short-term arrangements with other electric utilities and with the California Independent System Operator (CAISO) for transmission access and for power purchases and sales. DWR's generators and pumps also provide a mix of regulation, spinning, and nonspinning reserves to the CAISO's ancillary services market. In addition, DWR's power resources program takes advantage of SWP water storage and conveyance capacities to control pump loads and generation in a cost-effective manner.

## Major Electric Utility Industry Developments

In 2012, CAISO focused on correcting deficiencies within its market structure due to market power and addressing the impact of increasing renewable generation.

The 2,000 megawatt (MW) outage of the San Onofre Nuclear Generating Station at the beginning of 2012 created tight supply and demand conditions and frequent congestion in Southern California. Intermittent renewable energy generation reached more than 5 percent of system energy in the State, causing more exceptional dispatches and the need for more flexible and fast ramping resources. These issues were partially addressed in April 2012 when CAISO implemented a new method for mitigating local market power in the day-ahead and real-time markets, which reduced the frequency of price spikes.

CAISO formally kicked off the flexible capacity procurement stakeholder process in January 2012 with the publication of an issue paper. The stakeholder process was initiated to address the need for flexible capacity arising from the penetration of renewable energy resources, which is inherently intermittent, and retiring flexible thermal resources subject to regulatory limits set on once-through cooling power plants.



In June 2012, CAISO management presented a set of Cost Allocation Guiding Principles to its Board of Governors. These principles outlined how to more equitably allocate market costs among participants based on cost causation. Although CAISO did not file these principles with FERC, it committed to examining existing products and future initiatives for adhering to them.

CAISO initiated a stakeholder process, Deliverability of Distributed Generation, that would allow Distributed Generation to qualify in meeting resource adequacy for a Load Serving Entity.

CAISO initiated another stakeholder process, Replacement Requirement for Scheduled Generation Outage, to replace the California Public Utilities Commission rule of resource adequacy capacity on planned outage. The CAISO stakeholder process would transfer the California Public Utilities Commission rule with modification to CAISO, so that resource adequacy capacity on planned outage could be administered by CAISO directly.

CAISO also initiated a stakeholder process to implement tariff changes needed to comply with FERC Order 1000. The order reforms electric transmission planning and cost allocation requirements for public utility transmission providers. The three primary topic areas are: (1) regional planning and cost allocation; (2) nonincumbent transmission developers; and (3) interregional transmission planning coordination and cost allocation. In 2012, Phase 1 of this CAISO stakeholder process focuses on implementing tariff changes to comply with areas 1 and 2 above.

During the second half of 2012, CAISO and stakeholders worked to revise CAISO's credit policy by prohibiting unsecured credit limits for speculative-grade credit participants, adding Automated Clearing House payment options, and clarifying payment deadlines and late payment penalties.

CAISO continued to refine policy for the Renewable Integration Market and Product Review (RIMPR) initiative. Part of the first phase, Regulation Energy Management, implemented in December 2012, allowed nongenerator resources such as batteries and fly-wheels to participate in the electricity market. RIMPR Phase 1 identified short-term solutions for integrating renewable resources onto the grid, such as lowering the energy bid floor, allowing variable energy resources to submit decremental bids, and bid cost recovery changes. Additional initiatives under RIMPR Phase 1 and RIMPR Phase 2, which focus on mid- to long-term solutions, continued during 2012.

Also in 2012, DWR procured greenhouse gas compliance instruments to meet its compliance and contractual obligations under the Cap and Trade Program administered by the California Air Resources Board. The program requires obtaining and surrendering one compliance instrument for each metric ton of greenhouse gas emissions resulting from electric energy generated in or imported into California.

## DWR Participation in Electric Utility Industry Activities

DWR continued to participate in CAISO's stakeholder processes to help ensure that tariff and business practice manuals are compatible with operations of wholesale market participants including the SWP. DWR's participation in CAISO stakeholder processes focused on the following primary elements:

- Market Initiatives Roadmap;
- RIMPR Phase 1 and Phase 2;
- Bid Cost Recovery mitigation;
- Ancillary Service Forced Buy-back;
- Cost Allocation Guiding Principles;
- Grid Management Charge rate structure for 2013;
- Dynamic transfer;

- Multi-stage generation enhancements;
- Load Granularity Refinements;
- Barriers to demand response;
- Residual and Uninstructed Imbalance Energy;
- Convergence Bidding;
- Participating Load refinement;
- Flexible Ramping Product;
- Regulation Energy Management (REM) ;
- Generator Interconnection Procedures;
- Transmission planning;
- FERC Order 1000 compliance;
- Local Capacity procurement for 2013 requirements;
- Annual Resource Adequacy processes including the Path 26 allocation, import allocation, and net qualifying capacity;
- Flexible Capacity Procurement;
- Deliverability of distributed generation; and
- Replacement requirement for scheduled generation outage of resource adequacy capacity.

In addition, DWR participated in the California Energy Commission's planning processes by submitting a demand forecast to the California Energy Commission.

Besides CAISO and California Energy Commission stakeholder processes, DWR participated in FERC proceedings to help ensure that various market requirements or cost allocation mechanisms were appropriately structured. This included the following major processes and litigations (with FERC docket number given in parenthesis, if applicable):

- CAISO's Treatment of Participating Load within Demand Response and Order 719 (ER11-2574, ER11-3616, ER11-4100, RM11-17-001);
- CAISO's penalties for market gaming (EL12-70);
- CAISO's penalty cost allocation (ER12-760);
- CAISO's multi-stage generation enhancement (ER12-992);
- CAISO's Convergence Bidding (ER11-4384, ER11-4580);
- CAISO's Bid Cost Recovery gaming (ER11-3713, ER11-3856, EL12-105, ER12-2539);
- CAISO's Flexible Ramping Constraint (EL12-50);
- CAISO's cost allocation and payment to regulation provider (ER12-1630);
- CAISO's Bid Cost Recovery resettlement (EL12-73);
- CAISO's Exceptional Dispatch gaming (ER12-2539);
- CAISO's contingency events dispatch (ER13-69);
- CAISO's extension of Participating Load Agreement (ER13-258);
- CAISO's greenhouse gas compliance costs (ER13-219);
- Procurement of Calpine's Sutter Plant under the Capacity Procurement Mechanism (ER12-897-000);
- CAISO's Generation Interconnection Procedures (ER12-1855);
- CAISO's approval authority for transmission projects costing \$50 million or less (ER12-2552);
- Pacific Gas and Electric Company's (PG&E) TO14 proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO and increase ETC rates under the Comprehensive Agreement between PG&E and SWP (ER12-2701);
- San Diego Gas & Electric Company's TO3-Cycle 6 proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER12-2454);
- Southern California Edison Company's (SCE) first annual update to its Formula Rate (ER11-3697);

- City of Colton’s proposed revision to transmission revenue requirements for retail and wholesale customers of CAISO (ER13-207);
- Startrans IO, L.L.C.’s proposed revision to transmission revenue requirements for retail and wholesale customers of CAISO (ER13-272);
- SCE’s proposed annual update to its Transmission Revenue Balancing Account (ER13-226) and Reliability Services tariff (ER13-227); and
- PG&E’s proposed annual update to its Transmission Revenue Balancing Account (ER13-46).

DWR also participated in litigation before the District of Columbia Circuit Court:

- FERC Cir. No. 11-1471: DWR participated in a brief presented before the United States Court of Appeals for the District of Columbia Circuit Court. The primary issues in the case are SCE challenges to FERC’s order setting SCE’s base return on equity at the median of the range of reasonableness and the need to update the return on equity based on the most recently available financial data for Treasury Bond yields.

## Bulk Electric System Reliability Standards

### Background

The Energy Policy Act of 2005 assigned ownership of the Bulk Electric System reliability to FERC and required the creation of an Electric Reliability Organization. The North American Electric Reliability Corporation (NERC) was named the Electric Reliability Organization by FERC in July 2006 and was tasked with establishing reliability standards for the Bulk Electric System. Compliance with NERC reliability standards is mandatory.

The Western Electricity Coordinating Council (WECC) is the implementation vehicle for promoting regional electric service reliability in both western Canada and the western United States. WECC has oversight for implementation of these standards and validation of compliance, including assessment of penalties and/or sanctions. Details of the NERC standards and the attributes of the compliance program appear in Bulletin 132-11.

### NERC Reliability Compliance—Program Goals

DWR is committed to fostering a culture of compliance by using a proactive approach that includes continuous education of DWR employees to ensure an understanding of and adherence to the regulatory requirements for which DWR is accountable.

DWR established its compliance program to ensure strict compliance with NERC’s mandatory reliability standards. These standards include specific impacts on operations, maintenance, physical security, and cyber security. The compliance program performs program audits and reviews to ensure successful and ongoing compliance. Audits and reviews are done by the oversight side of the compliance program and include only staff that are independent of any responsibility for complying with the reliability standards. Consultants or contractors can be used to assist with oversight and compliance activities.

### DWR’s Compliance Responsibility

DWR is currently registered with NERC for 6 of 15 functional areas. These are:

- Transmission Owner (TO);
- Load Serving Entity (LSE);
- Generation Owner (GO);
- Generation Operator (GOP);
- Purchasing and Selling Entity (PSE); and
- Resource Planner (RP).

DWR organizations responsible for the registered functional areas reside within the:

- State Water Project Field Division Office;
- Plant Asset Management Office;
- Administrative Services Office;
- State Water Project Operations Control Office;
- Systems Support Office;
- State Water Project Operations Office;
- Reliability and Security Office;
- State Water Project Power and Risk Office; and
- State and Federal Compliance and Compliance and Regulatory Office.

While some management and staff in these organizations are assigned ownership responsibility of reliability standards, all management and staff are obligated to support DWR's compliance efforts.

DWR has continued the work required to meet the compliance requirements of the reliability standards. DWR submitted its annual self-certification to WECC in January 2012, involving operations, maintenance, and engineering functions, and work on critical cyber assets. This process requires DWR to certify that it is currently in compliance with the requirements of a WECC-determined subset of standards or provide a violation report supported by a mitigation plan to resolve outstanding items. Violations may lead to financial penalties or reduced operating flexibility.

Every year, NERC creates a 3-year plan to address reliability standards development and revision. The Division of Operations and Maintenance aggressively pursued compliance with standards as they changed. The work to remain in compliance also increased in the current year to comply with cyber security requirements and for compliance oversight. DWR submitted mitigation plans to WECC when possible

violations were discovered as a result of self-audits.

WECC completed its first audit of DWR's compliance with the standards in February 2012. WECC found several instances of alleged violations for which DWR submitted mitigation plans. However, DWR also contested several of the alleged violations and entered into settlement discussions with WECC that are ongoing. Additionally, DWR hired a consultant to review its compliance structure and program and subsequently initiated a project to be implemented in 2013 to improve the compliance program and further develop a culture of compliance.

## Hydropower License Planning and Compliance

DWR holds three hydropower licenses issued by FERC: Oroville Facilities, FERC Project No. 2100; South SWP Hydropower, FERC Project No. 2426; and Pine Flat Transmission Line, FERC Project No. 2876. FERC licenses contain terms and conditions related to operations, maintenance, engineering, dam safety, security, environmental and cultural resources, recreation, and public safety. FERC also conducts safety, security, and environmental inspections, and DWR is required to comply with all findings of the inspections. Compliance with FERC requirements is an important function of DWR organizations since FERC has the authority to levy fines for noncompliance. FERC also considers the record of compliance when considering the term of license renewals.

On September 19 and 20, 2012, a workshop was held to train personnel on DWR's hydropower license compliance policies and practices. Guest speakers included FERC's Director and Deputy Director of the Division of Hydropower Administration and Compliance and FERC's Dam Safety Chief of the San Francisco Regional Office.



### **Oroville Facilities Relicensing**

On January 26, 2005, DWR filed an application with FERC requesting a new license for the Oroville Facilities. (More detailed information about the relicensing process is available in previous editions of Bulletin 132.) The existing 50-year license expired January 31, 2007; FERC is issuing annual licenses until the new license is issued. Issuance of the new license has been delayed pending issuance of the National Marine Fisheries Service (NOAA Fisheries) biological opinion. On April 19, 2012, FERC transmitted a letter to NOAA Fisheries requesting issuance of the biological opinion as soon as possible.

DWR certified the final environmental impact report on July 22, 2008. One month later, Butte and Plumas counties filed a lawsuit challenging the adequacy of the environmental impact report. In February 2010, the Attorney General, on behalf of DWR, informed Butte and Plumas counties that DWR was seeking \$675,000 in payment for the costs of preparing the administrative record. On July 21, 2011, the Superior Court granted DWR's request for payment, and payment was made by the counties on January 3, 2012. The case was heard later that month, with the Court ruling in DWR's favor. Tentative and final decisions were issued on April 16 and June 19, 2012, respectively. Butte and Plumas counties filed an appeal of the decision on August 6, 2012.

On November 19, 2010, DWR and PG&E submitted the final Habitat Expansion Plan for Central Valley salmon and steelhead to NOAA Fisheries for approval. The Habitat Expansion Plan proposed actions on the Lower Yuba River to meet the Habitat Expansion Agreement goal of providing spawning habitat sufficient to accommodate an estimated net increase of 2,000 to 3,000 spring-run Chinook Salmon in the Sacramento River Basin. On February 21, 2012, NOAA Fisheries initiated the 60-day

consultation period on the Habitat Expansion Plan as required by the Habitat Expansion Agreement. The consultation period included public meetings on February 21, 24, and 28, 2012. DWR and PG&E submitted comments to NOAA Fisheries on April 20, 2012.

### **South SWP Hydropower**

In October 2009, FERC issued an order amending Article 52 and Exhibit S of the FERC license for Project No. 2426. The order was issued in response to DWR's 2005 application for an amendment to revise the minimum stream flow requirements and fish stocking practices in Piru Creek below Pyramid Dam. The stream flow revisions were requested to reduce impacts on the listed Arroyo Toad and other special-status species. FERC's order also acknowledged the Department of Fish and Wildlife and NOAA Fisheries deliberations on future fish stocking practices in Piru Creek and provided 120 days for DWR to file a plan and schedule for providing catchable Rainbow Trout. DWR filed the plan with FERC on May 27, 2010. On August 26, 2010, FERC issued an order modifying and approving DWR's Arroyo Toad and sensitive species monitoring plan for Piru Creek. On October 11, 2011, DWR filed an application to amend Ordering Paragraph (D) and defer development of the fish stocking program until the completion of the biological opinion regarding fish stocking practices in Piru Creek. On February 20, 2012, FERC issued an order amending Article 52 and Exhibit S consistent with DWR's application with an additional requirement that DWR provide status reports every 6 months. On March 8, 2012, California Trout and Friends of the River requested a rehearing of FERC's order. FERC denied the rehearing request on September 20, 2012.

### **Existing SWP Power Facilities**

Figure 10-1 shows the names, locations, and nameplate capacities of DWR's primary power facilities.





**Figure 10-1 Names, Locations, and Nameplate Capacities of Primary Long-term Power Facilities**

## Hydroelectric

Economic hydroelectric generation provides the largest share of SWP power resources. The combined Hyatt Pumping-Generating Plant and Robie Thermalito Pumping-Generating Plant (Hyatt-Thermalito) generate about 2.2 billion kilowatt hours (kWh) of energy in a median water year, while the 3 MW from the Thermalito Diversion Dam Powerplant adds another 24 million kWh per year.

Generation at California Aqueduct recovery plants—Alamo, Devil Canyon, Gianelli, Mojave Siphon, and Warne—varies with the amount of water conveyed. These five plants generate about one-sixth of the total energy used by the SWP.

## Coal

Since July 1983, under the *Participation Agreement Reid Gardner Unit No. 4* between DWR and NV Energy (NVE), DWR has received energy from Reid Gardner Powerplant, a coal-fired facility in Nevada. Reid Gardner Powerplant consists of four units. DWR owns 67.8 percent of Unit 4, and NVE owns the remainder of Unit 4, as well as all of Units 1, 2, and 3. Under this agreement, DWR receives up to 235 MW from Unit 4, subject to NVE's limited right to interrupt DWR's energy deliveries. Whenever NVE interrupts DWR's scheduled energy, DWR receives payment based on NVE's combustion turbine costs. The Reid Gardner agreement expires in July 2013, and DWR will not extend or renew this agreement.

## DWR Power Planning Activities

In 2011, DWR completed a power planning study of the economic viability of a second unit at the Alamo Powerplant, which would be a qualified renewable small hydroelectric facility. The project was shown to provide substantial energy and greenhouse gas reduction benefits to DWR. Following the power planning study, DWR initiated a design study to determine whether a surge

chamber would be required and to conclude the project cost estimates. A project implementation decision will be made following completion of the design and cost studies.

DWR also studied two projects, the San Luis Transmission Project and the Delta Hub Transmission Project, that would have changed the interconnection of several SWP facilities from CAISO to the Western Area Power Authority. Connecting to the Western Area Power Authority was determined to have the potential to lower transmission costs. However, the studies concluded that reductions in transmission costs were more than offset by increases in energy and operations costs. Consequently, DWR decided not to proceed with the interconnection change.

In May 2012, the DWR CEQA (California Environmental Quality Act) Climate Change Committee oversaw the completion of DWR's Climate Action Plan (CAP) Phase I: Greenhouse Gas (GHG) Emissions Reduction Plan that established DWR's overall GHG emissions strategy. The CAP assesses the GHG emissions from on-going activities, sets goals for GHG reductions that will exceed State GHG mandates, and presents plans for how emissions reductions will be achieved. The SWP is DWR's largest source of GHG emissions, and the CAP memorialized the previously approved SWP Renewable Energy Procurement Plan (February 2010) as the method to achieve the SWP's CAP emission reduction goals.

## Contractual Resource Arrangements

Through joint development, DWR obtains a significant amount of capacity and energy for SWP operations from other utilities throughout California and the Southwest. However, with the implementation of the CAISO MRTU in April 2009, and implementation of CAISO's power markets that provide access to affordable day-ahead

and real-time energy, DWR is less reliant on marketers and other utilities to meet its net energy needs.

### **Joint Developments**

In 1966, DWR entered into a contract with the Los Angeles Department of Water and Power (LADWP) for joint development of the West Branch of the California Aqueduct. LADWP constructed and operates Castaic Powerplant, which is a pumped-storage facility connected to the LADWP transmission system at the Sylmar Substation. DWR receives capacity and energy at the Sylmar Substation based on weekly water schedules through the West Branch.

Gianelli Pumping-Generating Plant is a joint-use facility of DWR and the Bureau of Reclamation. DWR's share is 222 MW, and the Bureau of Reclamation's share is 202 MW.

### **Long-term Purchase Agreements**

In 1979, DWR entered into a contract with Kings River Conservation District to receive the output of the 165 MW hydroelectric Pine Flat Powerplant. The power plant supplies the SWP with about 400 million kWh of energy in median water years.

DWR also contracts for the energy output of five hydroelectric plants totaling 30 MW owned and operated by The Metropolitan Water District of Southern California (Metropolitan).

In May 2010, DWR entered into an agreement with the Northern California Power Agency (NCPA) and various public agencies to finance, construct, operate, and maintain the Lodi Energy Center—a new 280 MW natural gas combined cycle combustion turbine generation facility that NCPA would own and operate, and from which DWR would receive 33.5 percent of the output. Construction of the Lodi Energy

Center began in July 2010 and continued on schedule through 2011. The facility achieved its commercial operation date on November 27, 2012.

In support of its Renewable Energy Procurement Plan, DWR issued a request for proposal in January 2012 to procure renewable resources. DWR received more than 200 responses from 46 proposers by the February 21, 2012, due date. This resulted in the selection of the Recurrent Energy Columbia project. The Power Purchase Agreement is currently being developed and is expected to be executed in early 2013.

In an effort to make initial progress to “green” the energy portfolio of the SWP, DWR entered into a renewable Power Purchase Agreement with Alameda Municipal Power. The agreement term is October 15, 2012, through December 31, 2016. The new contract will provide certified renewable energy, with 28.3 MW from an existing geothermal project and 5.3 MW from landfill gas energy. Under this agreement, DWR will receive an estimated 183,000 megawatt hours (MWh) of annual generation. The geothermal plants are owned and operated by NCPA and are located at The Geysers geothermal field in Middletown, California. The landfill gas energy under the new contract will come from the Republic Services' Ox Mountain Landfill gas-to-energy plant in Half Moon Bay. The plant is owned and operated by a subsidiary of Ameresco, Inc. Landfill gas is created when organic waste decomposes, producing methane—the primary ingredient in natural gas and a greenhouse gas. The new energy contract will move DWR closer to its goal of reducing emissions by 50 percent below 1990 levels by 2020.

### **Short-term Purchase Agreements**

DWR typically transacts with member utilities and energy marketers of the WSPP. In 2012, these transactions included



capacity to meet the requirements of resource adequacy, which is a planning and procurement process to ensure adequate resources. In addition to transactions under the WSPP master agreement, DWR can purchase surplus energy from Metropolitan's Colorado River Aqueduct system according to the terms of the 1988 Coordination Agreement between DWR and Metropolitan. This agreement also provides for monthly surplus firm and economy energy sales from DWR to Metropolitan and energy exchanges between DWR and Metropolitan.

### Load Management

DWR operates its pumps through an extensive computerized network. This control system, coupled with the operating flexibility of DWR's pumping and generating plants provided by storage reservoirs, allows DWR to maximize pumping during off-peak periods when power costs are lower—usually at night—and maximize power generation during on-peak periods when power costs are higher. By taking advantage of this scheduling flexibility, when not restricted by operating requirements, SWP pump load and generation are optimized to reduce the net cost of power needed for SWP water deliveries.

### Demand Response

DWR is the largest single supplier of demand response in the CAISO market via a Participating Load Agreement under which DWR bids SWP load to be curtailed by CAISO when the price of energy in the CAISO market reaches DWR's bid price. Due to DWR's water delivery priority, these bids are normally restricted to contingency events.

### Contractual Transmission Agreements

DWR has contracts with CAISO, PG&E, and SCE for both transmission interconnections and network transmission service for SWP's power resources and pumping loads.

Under the Comprehensive Agreement with PG&E, DWR interconnects SWP power resources and pumping loads and receives 1,300 MW of firm network transmission service over the PG&E transmission system to serve SWP pump loads and power resources in Northern and Central California. Upon implementation of CAISO's MRTU on April 1, 2009, transmission service to serve SWP under the Comprehensive Agreement was redefined as point-to-point service. The remaining transmission service in Northern and Central California, which cannot be provided through the point-to-point service under the Comprehensive Agreement, is received from CAISO. Through the Comprehensive Agreement, DWR also provides a Remedial Action System to PG&E whereby certain SWP pumping and generating plants can be instantaneously curtailed under certain predefined emergency events.

In Southern California, DWR receives transmission service for SWP loads and resources through CAISO, and DWR has an interconnection agreement with SCE. Additionally, DWR has wholesale distribution service agreements with SCE for service over SCE's distribution transmission system from the CAISO interchange points to SWP loads and resources.

Under the participation agreement with NVE, DWR receives 235 MW of firm transmission service over NVE's transmission system between Reid Gardner Unit 4 and the El Dorado Substation. Under the Firm Transmission Service Agreement between SCE and DWR, which terminated at the end of 2012, DWR received 235 MW of firm transmission service over SCE's transmission system between El Dorado Substation and the Pastoria and Vincent substations. Effective January 1, 2013, CAISO's transmission service is used in place of SCE's firm transmission service.

## SWP Power Operations in 2012

Tables 10-1 through 10-4 present historical information about SWP power operations for calendar year 2012, including energy consumed, generated, purchased, and sold.

Please note that, in some instances, the tables in this chapter may not sum due to rounding.

### Energy Consumed

In 2012, energy used at the 29 SWP pumping and generating plants totaled 7.41 million MWh. According to the terms and conditions of various water conveyance contracts and exchange agreements, some water belonging to the Central Valley Project is pumped through Banks and Dos Amigos pumping plants and Gianelli Pumping-Generating Plant. The Bureau of Reclamation furnishes additional energy for this purpose.

Table 10-1 shows the amount of energy used each month at SWP pumping and power generating plants to operate the SWP in 2012, excluding transmission losses.

### Energy Generated and Purchased

Table 10-2 shows the amounts of energy generated at SWP facilities in 2012, as well as energy purchased for SWP operations.

#### Hydroelectric and Coal

The Hyatt-Thermalito power complex in Oroville generated 1.64 million MWh of energy in 2012.

Energy generated at SWP aqueduct recovery plants—Gianelli, Alamo, Devil Canyon, Mojave Siphon, and Warne—totaled 1.53 million MWh.

The SWP share of energy generated at the coal-fired Reid Gardner Unit 4 in Nevada totaled 1.03 million MWh.

## Contractual Resource Arrangements

SWP power operations rely on contractual arrangements as well as SWP facilities. These contractual arrangements include joint development projects and energy purchases.

### Joint Developments

Through the *West Branch Cooperative Development Agreement* with LADWP, DWR receives energy based on the amount of water scheduled through the West Branch. In 2012, LADWP provided 608,586 MWh for DWR's share of energy generated at Castaic Powerplant.

DWR's share of Gianelli Pumping-Generating Plant used 104,932 MWh and generated 143,287 MWh of energy.

### Purchases and Costs

Table 10-3 shows amounts of energy, transmission, and other services purchased in 2012, and the costs of purchases. Amounts include contractual short-term and long-term purchases. They also include transactions of energy, transmission, capacity, and ancillary services with CAISO.

DWR purchased 2.51 million MWh of energy at a cost of \$30.92 million after a total CAISO purchase offset of \$51 million. Other SWP-related costs, including transmission, operation, maintenance, and CAISO charges totaled \$257.98 million. This amount included: (1) \$4.36 million for debt service and \$4.77 million for operations and maintenance, both associated with Pine Flat Powerplant; (2) \$2.05 million for transmission service from Reid Gardner Unit 4 to El Dorado Substation and \$62.48 million for operations, maintenance, fuel, insurance, waste removal, and property taxes at Reid Gardner Unit 4; and (3) \$3.21 million for debt service and \$5.10 million for capital improvement, fuel, management, operation, maintenance, greenhouse gas allowance,



**Table 10-1 Energy Used at Pumping Plants and Power Plants in 2012, by Month (megawatt-hours)**

<b>Pumping Plants and Power Plants</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Total</b>
Hyatt-Thermalito Pumping-Generating Plant (station service)	94	116	174	164	75	3	0	388	78	2	3	3	1,099
North Bay Interim Pumping Plant	0	0	0	0	0	0	0	0	0	0	0	0	0
Cordelia Pumping Plant	658	127	60	159	548	1,018	1,056	1,073	1,476	1,342	1,034	811	9,362
Barker Slough Pumping Plant	443	64	61	82	370	1,063	1,211	1,109	1,346	976	873	267	7,865
South Bay Pumping Plant	793	6,121	6,169	10,810	14,905	13,491	14,584	15,953	13,628	6,662	1,388	2,813	107,316
Del Valle Pumping Plant	30	26	29	167	216	49	40	151	104	15	23	29	879
Banks Pumping Plant	63,865	29,178	25,347	22,192	28,421	25,386	97,746	102,033	74,295	58,316	50,482	73,418	650,681
Gianelli Pumping-Generating Plant (SWP share)	18,347	648	15,492	4,789	0	0	74	270	7,647	4,891	11,419	41,354	104,932
Dos Amigos Pumping Plant (SWP share)	26,565	20,100	6,141	19,911	31,053	27,736	60,540	57,944	37,424	36,429	26,461	11,745	362,049
Buena Vista Pumping Plant	30,218	17,548	19,714	32,891	51,604	42,432	42,551	41,461	41,706	43,741	39,821	23,591	427,278
Teerink Pumping Plant	30,772	18,475	22,037	35,633	52,881	40,120	40,325	39,973	42,244	45,129	42,369	25,226	435,184
Chrisman Pumping Plant	72,260	39,548	48,281	79,024	116,028	86,726	87,408	87,576	93,686	100,825	95,146	56,478	962,985
Edmonston Pumping Plant	267,424	144,255	175,966	290,164	424,008	312,202	313,352	315,204	340,496	367,238	351,122	208,451	3,509,882
Alamo Powerplant (station service)	0	1	4	7	16	58	63	58	44	49	48	60	408
Pearblossom Pumping Plant	43,076	22,531	19,119	41,814	67,371	53,586	50,193	48,033	55,230	71,331	46,971	17,938	537,193
Pine Flat Powerplant (station service) <sup>a</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0
Mojave Siphon Powerplant (station service)	4	14	23	13	0	0	5	0	3	1	16	35	113
Devil Canyon Powerplant (station service)	0	6	11	5	0	0	0	0	0	0	0	10	33
Oso Pumping Plant	12,165	6,586	11,666	15,802	20,551	13,009	13,698	14,269	14,648	12,297	21,624	16,455	172,770
Warne Powerplant (station service)	148	247	253	185	88	307	247	298	247	213	49	308	2,589
Las Perillas Pumping Plant	344	271	377	747	1,085	1,353	1,466	1,579	1,016	561	137	164	9,100
Badger Hill Pumping Plant	897	704	989	1,921	2,742	3,403	3,572	3,897	2,563	1,411	331	407	22,836
Devil's Den Pumping Plant	956	898	1,096	1,153	1,733	1,944	1,992	2,104	1,951	1,584	402	806	16,618
Bluestone Pumping Plant	895	843	1,027	1,078	1,620	1,810	1,846	1,952	1,813	1,460	379	757	15,481
Polonio Pass Pumping Plant	977	919	1,116	1,173	1,751	1,954	2,005	2,118	1,950	1,586	411	822	16,782
Greenspot Pump Station	879	56	844	899	1,241	1,614	1,689	1,686	1,759	1,405	1,310	1,112	14,495
Crafton Hills Pump Station	1,230	27	1,165	1,229	1,472	1,891	1,950	1,654	1,848	1,691	1,535	1,486	17,178
Cherry Valley Pump Station	136	14	125	130	135	132	143	149	173	169	162	165	1,633
<b>Total Energy Required for SWP<sup>b</sup></b>	<b>573,173</b>	<b>309,323</b>	<b>357,285</b>	<b>562,140</b>	<b>819,915</b>	<b>631,288</b>	<b>737,756</b>	<b>740,931</b>	<b>737,376</b>	<b>759,326</b>	<b>693,518</b>	<b>484,710</b>	<b>7,406,740</b>

<sup>a</sup> Pine Flat station service energy provided by CAISO under MRTU operation.<sup>b</sup> Totals may not sum due to rounding.

**Table 10-2 Energy Generated and Purchased in 2012, by Month (megawatt-hours)**

Sources of Energy	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>SWP Energy Sources</b>													
Hyatt-Thermalito Powerplant	90,654	77,890	71,042	47,264	150,716	136,124	246,713	254,359	192,909	154,361	133,376	87,771	1,643,179
Gianelli Pumping-Generating Plant (SWP share)	3,935	11,596	112	23,808	37,433	27,564	23,716	9,027	1,883	2,376	1,838	0	143,287
Alamo Powerplant	7,789	4,383	3,850	6,602	7,053	0	0	0	0	0	0	0	29,677
Mojave Siphon Powerplant	4,606	2,192	1,854	4,545	7,419	5,545	5,279	5,272	6,169	7,926	5,360	1,660	57,825
Devil Canyon Powerplant	72,850	40,261	38,664	77,468	115,235	95,670	89,216	86,621	95,629	121,248	77,238	30,935	941,034
Reid Gardner Unit 4	79,446	19,371	19,675	36,846	0	5,696	137,068	129,069	153,290	143,851	150,479	153,958	1,028,749
Warne Powerplant	26,002	14,067	24,279	32,618	41,895	27,131	29,103	29,391	30,331	24,762	44,315	30,627	354,522
<i>Subtotal</i>	<i>285,283</i>	<i>169,760</i>	<i>159,475</i>	<i>229,152</i>	<i>359,751</i>	<i>297,729</i>	<i>531,095</i>	<i>513,738</i>	<i>480,210</i>	<i>454,524</i>	<i>412,606</i>	<i>304,951</i>	<i>4,198,274</i>
<b>Energy Sources from Long-term Agreements</b>													
Castaic Powerplant	39,339	23,960	40,624	55,668	74,280	47,634	49,631	51,602	53,125	44,357	74,670	53,696	608,586
Metropolitan Small Hydro Generation	6,909	3,633	8,849	11,259	14,459	14,465	11,036	12,842	12,807	12,065	9,205	6,409	123,937
Pine Flat Powerplant (Kings River Conservation District)	0	2,577	997	17,811	39,227	90,008	80,569	16,532	216	0	0	0	247,937
Energy to Metropolitan for CRA <sup>a</sup> Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy from Metropolitan for CRA <sup>a</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodi Energy Center	0	0	0	0	0	0	0	0	0	0	3,383	36,480	39,863
<b>Purchases</b>													
Purchases (Firm and WSPP Contracts)	154,865	185,065	147,790	157,603	216,020	164,275	173,400	177,600	212,400	166,865	186,543	189,931	2,132,357
CAISO Energy <sup>b</sup>	166,778	(55,672)	75,150	140,647	188,978	89,976	(57,974)	22,617	36,217	81,515	7,111	(106,757)	588,587
<i>Subtotal</i>	<i>367,891</i>	<i>159,563</i>	<i>273,410</i>	<i>382,989</i>	<i>532,963</i>	<i>406,358</i>	<i>256,662</i>	<i>281,193</i>	<i>314,765</i>	<i>304,802</i>	<i>280,912</i>	<i>179,759</i>	<i>3,741,267</i>
Total Resources	653,173	329,323	432,885	612,140	892,715	704,088	787,756	794,931	794,976	759,326	693,518	484,710	7,939,540
Less Energy Sales	(80,000)	(20,000)	(75,600)	(50,000)	(72,800)	(72,800)	(50,000)	(54,000)	(57,600)	0	0	0	(532,800)
<b>Total Energy Provided to the SWP<sup>c</sup></b>	<b>573,173</b>	<b>309,323</b>	<b>357,285</b>	<b>562,140</b>	<b>819,915</b>	<b>631,288</b>	<b>737,756</b>	<b>740,931</b>	<b>737,376</b>	<b>759,326</b>	<b>693,518</b>	<b>484,710</b>	<b>7,406,740</b>

<sup>a</sup> Contractual Resource Arrangement.

<sup>b</sup> Energy provided by CAISO for balancing the total SWP loads and resources.

<sup>c</sup> Totals may not sum due to rounding.

**Table 10-3 Energy, Transmission, and Related Costs in 2012**

Category	Energy Purchased (MWh)	Energy Cost (in dollars)	Transmission Cost Outside CAISO (in dollars)	Other Energy-related Costs (in dollars)	Total Cost (in dollars)
CAISO–Bilaterals (Purchase Offset)		(51,001,515)			(51,001,515)
CAISO–Other <sup>a</sup>				176,109,325	176,109,325
Energy Marketers–Bilaterals (WSPP)	2,099,500	71,577,271		1,949,010	73,526,281
Long-term Contracts <sup>b</sup>	371,873	8,970,687	18,886,142	79,925,580	107,782,409
Renewable Energy (WSPP) <sup>c</sup>	41,494	1,369,302			1,369,302
<b>Total</b>	<b>2,512,867</b>	<b>30,915,745</b>	<b>18,886,142</b>	<b>257,983,915</b>	<b>307,785,802</b>

<sup>a</sup> Transmission, capacity, imbalance energy, etc.

<sup>b</sup> Kings River Conservation District, The Metropolitan Water District of Southern California, NV Energy, Northern California Power Agency, Pacific Gas & Electric Company, and Southern California Edison.

<sup>c</sup> Alameda Municipal Power.

**Table 10-4 Energy Sold in 2012 and Revenues from Sales per Contract Agreements**

Category	Energy Sold (MWh)	Revenue from Energy Sales (in dollars)	Other Energy-related Revenue (in dollars)	Total Sales (in dollars)
CAISO–Bilaterals (Sale Offset)		(16,020,064)		(16,020,064)
CAISO–Other <sup>a</sup>			100,189,708	100,189,708
Energy Marketers–Bilaterals (WSPP)	532,800	15,929,340	883,026	16,812,366
Long-term Contracts <sup>b</sup>	42,588	1,540,429	2,502,568	4,042,997
<b>Total</b>	<b>575,388</b>	<b>1,449,705</b>	<b>103,575,302</b>	<b>105,025,007</b>

<sup>a</sup> Transmission, capacity, imbalance energy, etc.

<sup>b</sup> Los Angeles Department of Water and Power, Northern California Power Agency, NV Energy, City of Santa Clara, and Western Area Power Administration.

and transmission-related charges connected to the Lodi Energy Center Project.

**Long-term Purchase Agreements.** According to terms of the Kings River Conservation District contract, DWR receives the total output of the 165 MW Pine Flat Powerplant. In 2012, the power plant provided 247,938 MWh of energy to the SWP at an energy component cost of \$1.90 million.

Under the Metropolitan Small Hydro contract, DWR purchased 123,935 MWh of energy in 2012 from five small hydroelectric power plants on the Metropolitan system at a cost of \$7.07 million.

Also, under the Lodi Energy Center Power Sales Agreement with Northern California Power Agency, DWR received a purchase credit of \$1.44 million based on 39,863 MWh

generated at the Lodi Energy Center plant during November and December 2012. For reporting purposes, these amounts are part of the total revenues listed in Table 10-4.

#### **Short-term Energy Purchase Agreements.**

Existing resources and long-term power and transmission contracts ensure that the SWP has enough power to meet long-term needs.

When SWP power requirements exceed resources during daily operations, short-term purchases make up the difference. In 2012, the SWP purchased 2.14 million MWh of short-term energy under the WSPP agreement from 10 WSPP marketers and 2 public electric utilities at a cost of \$72.95 million. However, after applying adjustments associated with CAISO purchase offsets, the total cost was \$21.95 million.

## Contractual Sales of Excess Power

In 2012, DWR sold 575,388 MWh of energy for a total of \$17.47 million. However, after applying CAISO sale offset adjustments, the total revenue was \$1.45 million. These sales include 532,800 MWh of energy with revenue of \$15.93 million transacted through WSPP and sold to four marketers and three electric utilities. DWR also received \$103.57 million in revenues for capacity and other energy related services. This value includes, among other things, \$100.19 million for ancillary services transactions made through CAISO. It also includes \$299,917 for ancillary service fees collected from the U.S. Department of Energy, Western Area Power Administration, associated with a June 27, 2012, contract with DWR for CAISO Scheduling Coordinator Services. Under the terms of this contract, DWR acts as a scheduling coordinator for the joint-use facilities of the San Luis Unit and certain DWR pumping facilities occasionally used to pump federal water. See Table 10-4 for information about energy and other services sold and revenue received.

## Forecasting Power Operations

Each year, after reviewing the SWP water contractors' water delivery requests and the construction schedule for future facilities, DWR forecasts the associated energy consumption and generation through 2035. Short-term power requirements, based on actual water supply and reservoir storage levels, are determined for the current and two ensuing years of operation. Long-term operational studies for the remaining years are based on median-year water supply conditions and optimal reservoir storage levels. The forecast also includes losses in reservoirs and aqueducts, recreation water, and water to replace storage in reservoirs south of the Delta.

Actual SWP power requirements may vary significantly from the forecast amounts.

Those variations are due to the amount of water available and delivered in a given year. For example, dry conditions in Northern California could result in a reduction in the amount of water available for delivery and for generation. If full deliveries could not be made, less power would be used. Power requirements could also decrease during a wet year because of the availability of local water in the San Joaquin Valley or Southern California.

Conversely, power requirements could exceed the amount originally forecast if actual water deliveries are greater than the amounts estimated. For example, if additional pumping is needed to refill reservoirs south of the Delta after an unexpectedly dry year, more power would be used.







## **Chapter 11**

# **Facilities Maintenance**

*Silverwood Lake and Cedar Springs Dam.*

## Significant Events in 2012

An inspection at the Thermalito Afterbay's river outlet structure was completed with divers. The inspection included the upstream and downstream surfaces of the radial gates, concrete apron, and energy dissipators.

The Bureau of Reclamation (Reclamation) performed a Periodic Facility Review for the joint-use facilities (Sisk Dam, O'Neill Dam and Forebay, Los Banos Detention Basin, and Little Panoche Detention Dam).

An independent consulting Director's Safety Review Board and Potential Failure Mode Workshop were held for Antelope, Frenchman, and Grizzly Valley dams.

Frenchman Dam outlet works pipeline inspection was completed. Construction of Dyer Reservoir, one of the facilities associated with the South Bay Aqueduct Enlargement and Improvement projects, was completed.

Maintenance work was completed on Cedar Springs Dam left abutment access road. Refurbishment work on Castaic Dam's low-level outlet gate and stems was completed.

*Information for this chapter was provided by the Division of Operations and Maintenance, the Division of Safety of Dams, the Division of Integrated Regional Water Management, and the State Water Project Analysis Office.*



The Department of Water Resources (DWR), through the Division of Operations and Maintenance (O&M), monitors all State Water Project (SWP) facilities to ensure safety and reliability. DWR is required, by federal and State law, to contract periodically with independent consultants to review the safety of SWP dams and power facilities.

## Inspecting and Maintaining Project Dams

DWR conducts several types of inspections of SWP facilities to ensure that each dam is safe for continued operation. O&M staff collect and evaluate data regarding the performance of each facility. The Division of Safety of Dams (DSOD) has several programs to ensure the safety of SWP dams. DSOD engineers inspect SWP dams annually, on a fiscal year basis, to ensure they remain safe, are performing as intended, and are not developing problems. These annual inspections also include in-depth instrumentation review of dam surveillance data. Engineers from DSOD also evaluate proposed modifications to existing dams, as well as designs for any proposed new jurisdictional dams. DSOD also oversees construction activities to ensure work is performed in accordance with the approved plans and specifications. The Federal Energy Regulatory Commission (FERC) inspects all licensed SWP facilities annually. These inspections include a review of significant events, instrumentation data, and the visual appearance of each dam, penstock, or power plant. In addition, under FERC and California Water Code requirements, consulting engineers and geologists are retained to evaluate SWP dam facilities every 5 years.

DWR contracts periodically with independent consultants to review the safety of SWP dams and power facilities, except for Pearblossom Spill Basin. Pearblossom Spill Basin Dam was originally designed to be used during misoperation at the Pearblossom Pumping Plant; the spill basin was never fully completed and has never been used.

## Routine Inspections

During 2012, DSOD, along with O&M staff, inspected Antelope, Frenchman, and Grizzly Valley dams in the Upper Feather River area as part of the Director's Safety Review Board; Thermalito Forebay, Thermalito Afterbay, and Feather River Fish Barrier dams in the Oroville Field Division; Bethany, Clifton Court Forebay, Del Valle, Dyer, and Patterson dams in the Delta Field Division; and Castaic, Crafton Hills, Cedar Springs, and Devil Canyon Second Afterbay dams in the Southern Field Division.

Oroville, Bidwell Bar Saddle, Parish Camp Saddle, and Thermalito Diversion dams, along with Perris and Pyramid dams in the Southern Field Division, were inspected during calendar year 2011 and will be inspected in calendar year 2013, as part of DSOD's fiscal year reporting cycle.

## Joint-use Facility Inspection

The four dams in the San Luis Field Division (Sisk Dam, O'Neill Dam, Los Banos Detention Dam, and Little Panoche Detention Dam) are used jointly with the Bureau of Reclamation (Reclamation) and are not under DSOD jurisdiction. Every 6 years, Reclamation conducts a Comprehensive Facility Review (CFR) of these joint-use facility dams. The CFRs for Sisk Dam, O'Neill Dam, Los Banos Detention Dam, and Little Panoche Detention Dam occurred in 2009. Periodic Facility Reviews (PFRs) are also conducted by Reclamation every 6 years using an alternate schedule spaced between the CFRs. PFRs were conducted for the joint-use facilities in 2012.

## Independent Reviews

### California Water Code Reviews

To comply with the California Water Code and the California Code of Regulations, DWR is required to retain a consulting board to review: (1) the adequacy of the design of any dam or reservoir DWR proposes to construct and (2) the safety of the completed construction, including the terms and conditions for the Certificate of Approval.

These provisions require DWR to retain a board of three consultants to meet at least once every 5 years to review the operational performance of DWR-owned dams and more frequently when consulting on new dams. The board of consultants independently reviews and assesses safety conditions of SWP dams.

Consultants are selected based on their knowledge of geotechnical, structural, and civil engineering, including their experience evaluating dam performance. Their independent assessments include the review of dam performance during earthquakes, evaluation of instrumentation data, inspection of each dam, and evaluation of studies performed by DWR. The consultants then prepare reports on each dam, approving dams as safe for continued operation and making recommendations. Based on these recommendations, DWR prepares action plans.

In 2012, an independent consulting Director's Safety Review Board was held for Antelope, Frenchman, and Grizzly Valley dams. The independent consultants also participated in a Potential Failure Mode Workshop for these dams.

### FERC Reviews

FERC reviews and the FERC Part 12D safety inspections, which may be conducted by one or more consultants, are scheduled every 5 years. No Part 12D safety inspections

occurred for SWP dams in 2012. As a supplement to the FERC Part 12D safety inspection, FERC's Dam Safety Performance Monitoring Program requires that a Potential Failure Mode Analysis be performed for FERC-licensed dams. The Potential Failure Mode Analysis involves document review and site visits to develop a comprehensive list of potential failure modes at each dam. From this review process, three documents are generated: the FERC Part 12D Safety Inspection Report; the Potential Failure Mode Analysis Report; and the Supporting Technical Information document, which summarizes the project elements and details that do not change significantly over time.

## Arroyo Pasajero Program

The Arroyo Pasajero and its tributaries drain approximately 530 square miles of the Diablo Range of the coastal mountains west of the California Aqueduct in Fresno County. Its downstream juncture with the San Luis Canal segment of the California Aqueduct, between Highway 198 and Avenal Cutoff Road, poses a particularly difficult operational and maintenance problem for the SWP. Reclamation designed and constructed the San Luis Canal segment of the California Aqueduct, while DWR operates and maintains it, with all costs shared 45 percent and 55 percent, respectively.

During periods of heavy rainfall, high flows in the Arroyo Pasajero and its tributaries transport heavy sediment loads eroded from the Arroyo Pasajero watershed. Over a vast amount of time, sediment transported by arroyo floods formed a 450-square-mile alluvial fan extending from its apex at the eastern margin of Pleasant Valley (Anticline Ridge) to the San Joaquin Valley trough. The California Aqueduct traverses the arroyo's alluvial fan and forms a barrier to arroyo flood flows. Flood control facilities, designed to accommodate Arroyo Pasajero floodwater, include the West Side Detention Basin (designed to store floodwater and

sediment west of the California Aqueduct), an evacuation culvert to release floodwater east of the California Aqueduct, and drain inlets to release floodwater into the California Aqueduct.

Since the floods of 1969, when nearly all of the detention basin's planned 50-year sediment storage capacity was filled by deposition, DWR and Reclamation have worked to mitigate the effects of heavy flooding and the diminished storage capacity of the detention basin. In 1980, asbestos discovered in The Metropolitan Water District of Southern California's water supply was traced to runoff from the Arroyo Pasajero and other Diablo Range streams. This discovery, in conjunction with the high cost of removing sediment from the California Aqueduct, led DWR to adjust operating procedures to minimize runoff entering the California Aqueduct. The volume of runoff and sediment transported by the Arroyo Pasajero is roughly 400 percent greater than was originally estimated during the design of the detention basin in the mid-1960s.

### **DWR and DWR/Reclamation Alternative Long-term Solution**

Construction to restore the storage capacity of the West Side Detention Basin started in August 2004, and many of the designed improvements were completed by the summer of 2005. These improvements restored the storage capacity to the detention basin and added control over releases of floodwater into the California Aqueduct and onto private farmland. The intended 50-year level of protection is achieved by raising levees, adding a control structure equipped with an inflatable rubber dam, installing flood gates, and acquiring flood easements. As of 2012, the basin's flood control features continued to function as expected.

In 2009, DWR signed the certificate of acceptance for the deeds for the easements and lands acquired via litigation. The deeds

were recorded, and the process to transfer the rights to Reclamation, as required by the joint-use agreement, was initiated. In 2011, the transfer documents were completed and submitted to Reclamation for acceptance. In 2012, DWR worked with Reclamation staff to address issues with the transfer documents. The biggest issue was the State's use of Director's deeds to transfer the titles verses warranty deeds that are required by Reclamation.

The West Side Detention Basin is an area of interest in the U.S. Environmental Protection Agency (EPA) Atlas Mine Area Operable Unit Record of Decision issued by the EPA in 1991. Five-year reviews of the Atlas Mine Area Operable Unit began in 2001, and have continued every 5 years since. In fall 2010, as a part of the upcoming 2011 review cycle, DWR toured the basin with representatives from the EPA and inspected all of the basin flood control features as well as soil berms, gates, locks, and signs used to deter soil disturbing activities. The EPA released its Five-Year Review Report in August 2011. The report contained various recommendations for DWR to take into consideration while operating the basin. As of 2012, DWR continued its standard operating procedures within the basin to comply with the EPA's Comprehensive Environmental Response Compensation and Liability Act (Superfund law).

In September 2011, the California Department of Transportation (Caltrans) informed DWR that it had funding through final design on the proposed bridge project at Lassen Avenue (State Route 269) over Arroyo Pasajero. DWR provided comments on the current project study report in October 2011, which focused on flood control and the ongoing O&M needs of DWR's field division staff to properly maintain the channel. During 2012, Caltrans requested clarification of DWR's previously recommended borrow sites. Due to concerns over flood impacts and O&M operations, DWR provided



Caltrans with a new recommended borrow site located within the Westside Detention Basin land already owned in fee title.

## Related Activities

Planning for a restoration project similar to the West Side Detention Basin restoration project began in 2006 for the Cantua Creek Stream Group detention basins. The project goal is to improve aqueduct flood protection and water quality.

A feasibility-level study for the Cantua Creek Stream Group Improvement Project, completed in April 2011, identified actions such as raising embankments, making modifications to structures, and acquiring flood easements to provide a 50-year level of protection for the California Aqueduct at the Cantua Creek Stream Group. Improving water quality in the aqueduct was a significant goal of the study, since currently, several of the existing drain inlets are not gated, and sediment-laden floodwater flows directly into the aqueduct with little detention and decanting. It is widely understood that increasing flood storage and detention of this floodwater prior to releasing it into the California Aqueduct would provide a significant benefit to water quality in the aqueduct. In 2012, while DWR's Division of Engineering had the preliminary design underway, DWR's Real Estate, Geology, Surveys, and Environmental branches continued to gather information needed for the final design.

## Repairs, Modifications, and Inspections

DWR continually monitors all SWP facilities and performs repairs, modifications, and inspections as necessary to ensure safe, reliable water delivery.

In 2012, Condition Assessment Program inspections were performed on more than 20 different reaches of the SWP for more

than 178 miles of canals, pipelines, and tunnels. To aid in maintenance efforts, check structures, culverts, drain inlets, overchutes, turn-ins, turnouts, and utility crossings along the canal were inspected and rated.

In the Delta Field Division, features along 32 miles of the California Aqueduct were inspected, including portions of the North Bay Aqueduct, Del Valle Pipeline, Sunol Pipeline, and Santa Clara Pipeline.

In the San Joaquin Field Division, features along 78 miles of the California Aqueduct were inspected.

In the Southern Field Division, features along 68 miles of the West and East branches of the California Aqueduct were inspected, including the Peace Valley Pipeline.

Inspections are scheduled annually, biannually, or every 5 years. Future inspections will aim to identify trends in maintenance and aging of the SWP.

## Outages for Maintenance and Repair of Facilities

Table 11-1 presents information, arranged chronologically, about significant scheduled and unscheduled outages at SWP pumping and power plants in 2012. The table includes information about incidents resulting in outages of 14 days or more.

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2012, by Month**

1 of 7

Month	Facility	Unit	Outage Description
January	Banks Pumping Plant	1	January 23 to February 10 for Condition Assessment Program inspection and unit preventive maintenance schedule
	Banks Pumping Plant	4	January 1 to April 30 for discharge valve removal and refurbishment
	Banks Pumping Plant	5	January 1 to January 20 for low-voltage drop on start
	Banks Pumping Plant	5	January 20 to March 9 for low-voltage drop on start
	Banks Pumping Plant	8	January 23 to June 28 for 86E lockout, motor field temperature high
	Barker Slough Pumping Plant	1	January 26 to February 11 for failure to start in remote auxiliary
	Barker Slough Pumping Plant	3	January 17 to March 8 for failure to start in remote auxiliary
	South Bay Pumping Plant	3	January 1 to December 31 for pump removal/pump and motor replacement
	South Bay Pumping Plant	5	January 1 to February 9 for seismic retrofit of Surge Tank 2
	South Bay Pumping Plant	6	January 1 to February 9 for seismic retrofit of Surge Tank 2
	South Bay Pumping Plant	7	January 1 to February 9 for seismic retrofit of Surge Tank 2
	South Bay Pumping Plant	8	January 1 to February 9 for seismic retrofit of Surge Tank 2
	South Bay Pumping Plant	9	January 1 to February 9 for service
	South Bay Pumping Plant	10	January 1 to April 13 for seismic retrofit of Surge Tank 2
	South Bay Pumping Plant	11	January 1 to April 6 for seismic retrofit of Surge Tank 2
	South Bay Pumping Plant	12	January 1 to June 28 for motor pump removal; continued on December 14
	South Bay Pumping Plant	13	January 1 to January 18 for vibrations
	Hyatt Powerplant	1	January 1 to January 17 for thrust channel installation; continued on December 30
	Hyatt Powerplant	2	January 1 to December 31 for cover plate inspection; continued from February 9, 2010
	Hyatt Powerplant	3	January 1 to January 18 for thrust channel installation; continued on December 30
	Hyatt Powerplant	4	January 1 to June 30 for excess thrust bearing load; continued from May 6, 2009
	Hyatt Powerplant	5	January 21 to April 4 for inspection of turbines; repair water leak
	Hyatt Powerplant	6	January 1 to December 31 for last on/first off spiral case leakage
	Robie Thermalito Pumping-Generating Plant	4	January 1 to November 22 for refurbishment and relay replacement; continued from October 9, 2008
	Devil Canyon Powerplant	1	January 23 to February 17 for annual Condition Assessment Program

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2012, by Month**

2 of 7

Month	Facility	Unit	Outage Description
	Oso Pumping Plant	5	January 1 to May 22 for motor and impeller removal; continued from December 8, 2008
	Pearblossom Pumping Plant	1	January 1 to July 20 for overhaul; continued on October 10
	Warne Powerplant	2	January 1 to January 16 for outage on transformer KY2 and biennial Condition Assessment Program inspection
	Bluestone Pumping Plant	1	January 1 to July 2 for repair of discharge valve; continued on November 6
	Bluestone Pumping Plant	2	January 1 to October 26 for repair of discharge valve, continued on November 6
	Buena Vista Pumping Plant	4	January 1 to December 31 for complete unit refurbishment
	Edmonston Pumping Plant	2	January 17 to March 23 for coating and repairs on elbow
	Edmonston Pumping Plant	4	January 1 to January 17 for coating and repairs on suction elbow; continued on October 31
	Edmonston Pumping Plant	12	January 1 to December 31 for pump and motor refurbishment
	Las Perillas Pumping Plant	5	January 1 to March 14 for motor refurbishment; continued on October 7
	Polonio Pass Pumping Plant	3	January 1 to September 3 for failure to start; continued on December 2
	Polonio Pass Pumping Plant	4	January 1 to June 19 for outboard bearing replacement
	Chrisman Pumping Plant	2	January 1 to December 31 for motor refurbishment
	Teerink Pumping Plant	1	January 1 to December 31 for annual pump and motor refurbishment
	Giannelli Pumping-Generating Plant	3	January 23 to April 11 for hatch cover removal
	Giannelli Pumping-Generating Plant	4	January 23 to April 11 for hatch cover removal
	Giannelli Pumping-Generating Plant	5	January 1 to December 31 for unit overhaul
	Giannelli Pumping-Generating Plant	7	January 1 to February 9 for head cover leakage
	Giannelli Pumping-Generating Plant	8	January 1 to February 9 for head cover leakage
	Pine Flat Powerplant	2	January 1 to February 21 for draft tube coating warranty inspection; continued on December 15
February	Banks Pumping Plant	7	February 13 to March 2 for Condition Assessment Program inspection
	Cordelia Pumping Plant	2	February 2 to September 13 for electrical problems
	South Bay Pumping Plant	1	February 8 to April 13 for seismic retrofit of Surge Tank 1

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2012, by Month**

3 of 7

Month	Facility	Unit	Outage Description
	South Bay Pumping Plant	2	February 8 to April 13 for seismic retrofit of Surge Tank 1
	South Bay Pumping Plant	4	February 8 to April 13 for seismic retrofit of Surge Tank 1
	Greenspot Pump Station	1	February 1 to March 1 for East Branch Extension Interconnect Pipeline work and Morton Canyon Valve Vault weld inspections
	Greenspot Pump Station	2	February 1 to March 1 for East Branch Extension Interconnect Pipeline work and Morton Canyon Valve Vault weld inspections
	Greenspot Pump Station	3	February 1 to March 1 for East Branch Extension Interconnect Pipeline work and Morton Canyon Valve Vault weld inspections
	Greenspot Pump Station	4	February 1 to March 1 for East Branch Extension Interconnect Pipeline work and Morton Canyon Valve Vault weld inspections
	Greenspot Pump Station	5	February 1 to March 1 for East Branch Extension Interconnect Pipeline work and Morton Canyon Valve Vault weld inspections
	Mojave Siphon Powerplant	1	February 6 to March 6 for annual Condition Assessment Program inspection
	Oso Pumping Plant	3	February 7 to February 22 for installation of fail-safe systems
	Oso Pumping Plant	4	February 7 to February 22 for installation of fail-safe systems
	Oso Pumping Plant	6	February 7 to February 22 for installation of fail-safe systems
	Pearblossom Pumping Plant	3	February 6 to March 2 for Condition Assessment Program and rotor inspections
	Warne Powerplant	1	February 6 to March 2 for Condition Assessment Program and governor Condition Assessment Program inspections
	Dos Amigos Pumping Plant	3	February 14 to February 28 for Condition Assessment Program inspection
March	Banks Pumping Plant	2	March 12 to April 5 for Condition Assessment Program preventive maintenance
	Barker Slough Pumping Plant	1	March 9 to March 30 for Travis Surge Tank pipeline inspection
	Barker Slough Pumping Plant	2	March 9 to March 30 for Travis Surge Tank pipeline inspection
	Barker Slough Pumping Plant	3	March 9 to March 30 for Travis Surge Tank pipeline inspection
	Barker Slough Pumping Plant	4	March 9 to March 30 for Travis Surge Tank pipeline inspection
	Barker Slough Pumping Plant	5	March 9 to March 30 for Travis Surge Tank pipeline inspection
	Barker Slough Pumping Plant	6	March 9 to March 30 for Travis Surge Tank pipeline inspection
	Barker Slough Pumping Plant	7	March 9 to March 30 for Travis Surge Tank pipeline inspection
	Barker Slough Pumping Plant	8	March 9 to March 30 for Travis Surge Tank pipeline inspection

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2012, by Month**

4 of 7

Month	Facility	Unit	Outage Description
	Barker Slough Pumping Plant	9	March 9 to March 30 for Travis Surge Tank pipeline inspection
	Cordelia Pumping Plant	1	March 12 to April 2 for 4160 BUS for Western Electricity Coordinating Council Compliance
	Cordelia Pumping Plant	2	March 12 to April 2 for 4160 BUS for Western Electricity Coordinating Council Compliance
	Cordelia Pumping Plant	3	March 12 to April 2 for 4160 BUS for Western Electricity Coordinating Council Compliance
	Cordelia Pumping Plant	4	March 12 to April 2 for 4160 BUS for Western Electricity Coordinating Council Compliance
	Devil Canyon Powerplant	2	March 5 to April 2 for annual Condition Assessment Program inspection
	Edmonston Pumping Plant	6	March 28 to June 28 for suction elbow repairs
	Las Perillas Pumping Plant	5	March 22 to May 3 for motor refurbishment
	Teerink Pumping Plant	2	March 19 to April 11 for transformer KYA bushing repair
	Teerink Pumping Plant	3	March 19 to April 11 for transformer KYA bushing repair
	Teerink Pumping Plant	4	March 19 to April 11 for transformer KYA bushing repair
	Teerink Pumping Plant	5	March 19 to April 11 for transformer KYA bushing repair
April	Banks Pumping Plant	3	April 17 to May 4 for failure to depress air for remote auxiliary start
	South Bay Pumping Plant	10	April 13 to December 31 for vibration testing
	South Bay Pumping Plant	13	April 13 to December 31 for vibrations
	Mojave Siphon Powerplant	2	April 9 to May 7 for Condition Assessment Program inspection
	Pearblossom Pumping Plant	7	April 16 to May 11 for Condition Assessment Program inspection
	Dos Amigos Pumping Plant	4	April 9 to July 19 for Condition Assessment Program inspection
	Giannelli Pumping-Generating Plant	3	April 11 to April 26 for leaking scroll case door
	Giannelli Pumping-Generating Plant	4	April 11 to April 26 for leaking scroll case door
	Giannelli Pumping-Generating Plant	6	April 27 to June 28 for Condition Assessment Program inspection; repair bearing cooling water and valves
May	Banks Pumping Plant	10	May 4 to December 31 unit unavailable for BA10 discharge valve removal and refurbishment
	Banks Pumping Plant	11	May 4 to May 24 unit unavailable for discharge valve removal and refurbishment
	Banks Pumping Plant	11	May 27 to June 22 for failure to start in remote auxiliary due to upper wearing ring cold water contact failure



**Table 11-1 Outages for Maintenance and Repair of Facilities in 2012, by Month**

5 of 7

Month	Facility	Unit	Outage Description
	Del Valle Pumping Plant	2	May 18 to July 23 for tripping on unit start
	Hyatt Powerplant	5	May 1 to July 10 for generator field grounding
	Reid Gardner Powerplant	4	May 5 to June 27 for major boiler/valve overhaul
	Alamo Powerplant	1	May 23 to December 31 for governor oil pump failure to shut down
	Mojave Siphon Powerplant	3	May 21 to June 15 for Condition Assessment Program inspection
	Pearblossom Pumping Plant	9	May 14 to June 6 for Condition Assessment Program inspection
	Buena Vista Pumping Plant	9	May 29 to June 1 for Condition Assessment Program inspection
	Chrisman Pumping Plant	1	May 31 to June 29 for obstruction at trash rack unit
June	Barker Slough Pumping Plant	3	June 14 to July 17 for trip on start
	Barker Slough Pumping Plant	6	June 7 to December 31 for excessive vibration
	Cordelia Pumping Plant	2	June 12 to August 1 for trip on start, remote site
	South Bay Pumping Plant	11	June 2 to June 28 for trip and lockout on unit start
	Hyatt Powerplant	3	June 29 to July 27 for transformer K3A high winding temperature
	Pearblossom Pumping Plant	8	June 11 to July 27 for Condition Assessment Program inspection and mechanical seal replacement
	Bluestone Pumping Plant	3	June 5 to August 3 for failure to synchronize with the grid
	Edmonston Pumping Plant	8	June 28 to October 2 for suction elbow repairs
	Edmonston Pumping Plant	10	June 11 to June 28 out of service; unit died for unknown reason
July	Banks Pumping Plant	3	July 23 to August 30 for Condition Assessment Program inspection and other work
	Hyatt Powerplant	1	July 12 to July 27 for inspection of thrust channels
	Hyatt Powerplant	5	July 31 to December 31 for high winding temperatures
	Pearblossom Pumping Plant	2	July 25 to December 31 for rotor and exciter inspection, amortisseur bar damage
	Dos Amigos Pumping Plant	5	July 6 to August 28 for motor guide bearing
August	Thermalito Diversion Dam	1	August 6 to September 6 for remote terminal unit replacement
	Devil Canyon Powerplant	3	August 27 to October 5 for Condition Assessment Program inspection
	Greenspot Pump Station	4	August 8 to August 24 for relay failure
	Pearblossom Pumping Plant	5	August 6 to August 31 for Condition Assessment Program inspection
	Bluestone Pumping Plant	3	August 9 to September 13 for loss of excitation

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2012, by Month**

Month	Facility	Unit	Outage Description
September	Dos Amigos Pumping Plant	5	August 28 to December 31 for motor guide bearing
	Banks Pumping Plant	5	September 4 to October 6 for Condition Assessment Program inspection
	Banks Pumping Plant	8	September 24 to October 18 for unit trip on 86 lockout, 86E, and power factor trip
	South Bay Pumping Plant	9	September 14 to December 31 for motor differential/overcurrent
	Hyatt Powerplant	4	September 17 to October 1 for rotary strainer repair
	Bluestone Pumping Plant	3	September 13 to December 31 for pump rebuild
	Polonio Pass Pumping Plant	1	September 6 to December 31 for pump rebuild
	Giannelli Pumping-Generating Plant	1	September 13 to December 31 for penstock work
October	Giannelli Pumping-Generating Plant	2	September 13 to October 12 for penstock work
	Banks Pumping Plant	6	October 15 to December 31 for Condition Assessment Program inspection and hydraulic knuckle replacement
	Cordelia Pumping Plant	3	October 9 to November 9 for protective relay and control power trouble
	South Bay Pumping Plant	12	October 16 to December 31 for motor inspection and repair
	Devil Canyon Powerplant	4	October 11 to November 16 for Condition Assessment Program inspection
	Giannelli Pumping-Generating Plant	6	October 9 to December 31 for wear ring repair
	Pine Flat Powerplant	1	October 29 to December 31 for annual switchyard maintenance
	Pine Flat Powerplant	2	October 29 to December 31 for annual switchyard maintenance
November	Pine Flat Powerplant	3	October 29 to December 31 for annual switchyard maintenance
	Cordelia Pumping Plant	2	November 8 to December 31 for motor removal and repair
	South Bay Pumping Plant	1	November 9 to November 26 for motor removal and repair
	South Bay Pumping Plant	2	November 5 to December 11 for tripping on unit start
	South Bay Pumping Plant	4	November 9 to November 26 for motor removal and repair
	Robie Thermalito Pumping-Generating Plant	1	November 22 to December 31 for fire damage
	Robie Thermalito Pumping-Generating Plant	2	November 22 to December 31 for fire damage
Robie Thermalito Pumping-Generating Plant	3	November 22 to December 31 for fire damage	

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2012, by Month**

7 of 7

Month	Facility	Unit	Outage Description
	Robie Thermalito Pumping-Generating Plant	4	November 22 to December 31 for fire damage
	Bluestone Pumping Plant	4	November 5 to November 27 for pump refurbishment
	Bluestone Pumping Plant	5	November 5 to December 7 for pump realignment
	Bluestone Pumping Plant	6	November 5 to December 13 for pump realignment
	Devil's Den Pumping Plant	1	November 5 to December 31 for discharge valve piping recoat
	Devil's Den Pumping Plant	2	November 5 to December 3 for discharge valve piping recoat
	Devil's Den Pumping Plant	3	November 5 to November 26 for discharge valve piping recoat
	Devil's Den Pumping Plant	5	November 17 to December 28 for abnormal noise at pump intake
	Teerink Pumping Plant	2	November 5 to December 31 for transformer KYA refurbishment
	Teerink Pumping Plant	3	November 5 to December 31 for transformer KYA refurbishment
	Teerink Pumping Plant	4	November 5 to December 31 for transformer KYA refurbishment
	Teerink Pumping Plant	5	November 5 to December 31 for transformer KYA refurbishment
December	Edmonston Pumping Plant	3	December 4 to December 20 for drive gear replacement
	Chrisman Pumping Plant	6	December 3 to December 31 for Condition Assessment Program inspection
	Chrisman Pumping Plant	7	December 3 to December 31 for Condition Assessment Program inspection
	Giannelli Pumping-Generating Plant	7	December 3 to December 31 for head cover leakage





## **Chapter 12**

# **Engineering, Construction, and Real Estate**

*The Curtis Landing fish release site improvement project at Sherman Island.*



## Significant Events in 2012

In 2012, engineering, construction, and real estate work to enhance, expand, repair, and protect the State Water Project (SWP) and other facilities within the State continued. Significant projects included the South Bay Aqueduct (SBA) enlargement, expansion of the South Bay Pumping Plant, Edmonston Pumping Plant refurbishment, Hyatt Powerplant pump-turbine refurbishment, Perris Dam remediation, and the East Branch Extension Phase I improvements and Phase II projects.

The Delta Habitat Conservation and Conveyance Program (DHCCP) continued with studies in 2012 to assess potential habitat restoration and water conveyance options.

*Information for this chapter was provided by the Division of Engineering.*

Initial construction of the State Water Project (SWP) facilities began in 1957 with the relocation of the Western Pacific Railroad facilities and Highway 70 near the City of Oroville to accommodate the SWP Oroville Facilities. Oroville Dam was constructed between 1961 and 1967. Construction of the South Bay Aqueduct (SBA) facilities started in 1960, and the first SWP water was delivered through the SBA in 1962 to serve Alameda County.

In 1963, work began on the California Aqueduct, and by 1968, the SWP was delivering water to long-term contractors in the San Joaquin Valley to the foot of the Tehachapi Mountains. By 1973, with the completion of Edmonston Pumping Plant at the foot of the Tehachapi Mountains and other East Branch conveyance facilities, the SWP was delivering water to Lake Perris at the southernmost point in Riverside County.

In 1974, SWP water was delivered to Los Angeles County through the West Branch facilities. SWP water was delivered to Napa County in 1968, through the first phase facilities of the North Bay Aqueduct (NBA), and to Solano County in 1988 by the second phase facilities. The first SWP water delivery through the Coastal Branch (Phase I) was made in 1968 to Kings and Kern counties.

Prior to the completion of the initial facilities in 1973, work began on the Upper Feather River facilities to supply local water, recreation, and fish enhancement. Power plants, additional pumping units, and turbine-generators that had been deferred during the initial construction of the SWP were built to ensure water quality and fish enhancement in the Delta.

From 1974 through 2012, design and construction activities included repairing concrete lining failures or potential failures of the canal system and concrete pipeline sections; replacing equipment components of existing facilities; enlarging or extending aqueduct reaches; refurbishing pump-

turbine units and adding pumps and motors to existing facilities; constructing the Devil Canyon Second Afterbay; constructing Phase II of the Coastal Branch to deliver water to San Luis Obispo and Santa Barbara counties in August 1997; extending the SWP through the East Branch Extension to the San Geronio Pass service area in San Bernardino and Riverside counties; SBA enlargement; and assessing potential habitat restoration and water conveyance options in the Delta.

## Design Activities

In 2012, work to enhance, expand, repair, and protect SWP water delivery facilities continued. Engineering activities supported more efficient water deliveries within the confines of legal constraints, environmental restraints, and power availability. Significant projects included Perris Dam remediation design, SBA enlargement, and preliminary design for the East Branch Extension Phase II projects. Table 12-1 (at the end of the chapter) provides a list of completed and ongoing design work that was undertaken in 2012.

The Department of Water Resources (DWR) Division of Engineering (DOE) continued to design projects for development into the construction phase, including awarding construction contracts. DOE staff worked with many DWR divisions and offices, as well as local, State, and federal agencies. DOE staff prepared preliminary designs and estimates; developed and administered

construction contract documents and carried out construction projects; and conducted special studies of dams, canal embankments, and other SWP facilities.

Studies, reports, and activities continued from previous reporting periods, or initiated in 2012, included the following:

- Oroville, Thermalito, and Pyramid dams radial gate structural re-evaluations—design;
- Sherman and Twitchell islands fish screens—final design;
- NBA alternate intake—study;
- Sisk Dam seismic re-evaluation—study;
- Edmonston, Chrisman, Teerink, and Buena Vista pumping plants—emergency generator replacement—design;
- Edmonston, Chrisman, Teerink, and Buena Vista pumping plants—furnish and install annunciator panels—design;
- San Joaquin Field Division—emergency generator replacement—design;
- East Branch Enlargement, Phase II—preliminary design and environmental documents;
- Perris Dam embankment remediation—design;
- Perris Dam emergency release extension—design; and
- Los Robles Bridge seismic analysis—design.

In 2012, DOE staff completed the following studies and activities:

- Brad B. Freeman Bike Trail realignment—design;
- Frank's Tract Pilot Project—design;
- SBA enlargement—69 kilovolt (kV) transmission line and Banks Switchyard—design;
- Teerink, Chrisman, and Buena Vista pumping plants—furnish and install 230 kV SF6 power circuit breakers—design;

- Edmonston, Chrisman, Teerink, and Buena Vista pumping plants—replace septic tanks, sewage piping, and pumps—design;
- South San Joaquin Division aqueduct turnouts—design and furnish platforms;
- East Branch Extension Phase II—project planning and engineering feasibility studies—design;
- Perris Dam outlet tower—study;
- Sutter Bypass motor control center replacement—design;
- Sutter Bypass—pumping plant control systems rehabilitation—design;
- early implementation program review—study;
- SWP seismic loading criteria—study; and
- Cache Creek Levee Mile 3.9 and Levee Mile 4.2 left bank emergency levee repair—design.

## Environmental Activities

Since the inception of the SWP, environmental issues have increased in magnitude with the enactment of numerous federal and State laws. DWR has complied with these laws by seeking appropriate permits, preparing environmental compliance documents, and incorporating environmental requirements and conditions into the design and execution of construction projects. Environmental scientists work with the design engineers to produce projects that meet the SWP objectives while having the least impact possible on the environment. Construction contract specifications and plans are reviewed and modified with the environmental compliance requirements and sensitive resource protection needs in mind. Ongoing construction activities are monitored to ensure compliance with requirements outlined in environmental permits for each contract. In 2012, projects requiring continuing environmental review are described below.

## Delta Habitat Conservation and Conveyance Program

In 2008, as a result of calls by the Governor and Legislature to protect the Delta, the Delta Habitat Conservation and Conveyance Program (DHCCP) was established, prompting studies to assess potential habitat restoration and water conveyance options. The DHCCP is conducting an environmental review of the Bay Delta Conservation Plan (BDCP). The lead agencies preparing the joint draft environmental impact report/environmental impact statement (EIR/EIS) for the BDCP are DWR, the Bureau of Reclamation (Reclamation), the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service.

DHCCP continued to:

- support the U.S. Army Corps of Engineers Section 408, 404, and 401(b)(1) permitting processes and alternatives analysis;
- maintain, update, and manage a database of questions, comments, and information requests related to the DHCCP and BDCP EIR/EIS;
- update the BDCP website and coordinate with other Delta-related programs regarding the DHCCP environmental and engineering process;
- develop a strategy to communicate DHCCP activities to others; and
- participate in meetings with the Department of Transportation regarding State Route 160 realignment.

The environmental component of the DHCCP includes environmental impact analysis, California Environmental Quality Act and National Environmental Policy Act document preparation, environmental surveys, mitigation, and all associated permitting requirements. Approval of the BDCP, its EIR/EIS, and associated documents is essential to obtaining required permits.

In 2012, the DHCCP accomplished the following:

- announced revisions to the BDCP (July 25, 2012, news release), which included reducing the proposed conveyance facility from five intakes to three, and from 15,000 cubic feet per second (cfs) to 9,000 cfs, and using gravity-flow tunnels;
- received Reclamation's "red flag" comments and began analyzing and preparing responses;
- released the administrative draft of the BDCP and its EIR/EIS documents and posted both documents to the website for public review;
- conducted six public meetings in Sacramento to discuss draft documents, working group meetings, and planning progress;
- resolved several issues through the Principals Group, made key decisions regarding fisheries and water operations, and supported the working group on biological goals and objectives;
- prepared a construction cost estimate for the 9,000 cfs option;
- posted new items to the BDCP website—four blogs, two fact sheets, one brochure, two background documents, and several documents related to BDCP planning agreements; and
- completed field exploration and lab testing for the first phase of the pipeline/tunnel option geotechnical exploration program.

More information can be found on the BDCP website.

## Construction Activities

DOE worked on 58 construction contracts in 2012. Projects included turbine and pump replacement, pipeline repair, trash rack upgrade at fish hatcheries, and recreational and maintenance facility improvements at dam and reservoir sites. Table 12-2



(at the end of the chapter) shows the following information for construction contracts: construction divisional facility, item, construction contract (specification number), date the contractor received the Notice to Begin Work, the expected or actual acceptance date (physical completion date is discussed in narratives below), and the actual or estimated cost (including change orders for added work). Resolution of contract claims may extend the actual contract closeout beyond the completion or acceptance date.

## **SWP—General**

### ***SWP Supervisory Control and Data Acquisition System***

A contract (Specification No. 08-12) to replace portions of the aging SWP SCADA (supervisory control and data acquisition) system began in May 2009. This contract will furnish and install 176 controller assemblies for the replacement of remote terminal units located throughout the SWP and will furnish 16 controller assemblies for Devil Canyon Powerplant and DWR's development lab at the Joint Operations Center. The controller assemblies will be assembled from components furnished by the contractor (programmable logic controllers, sequence-of-event recorders, fiber patch panels, modems, and other equipment). Work is scheduled to be completed in January 2015. Acceptance is expected in May 2015.

### ***Communication Cable***

Work began in July 2009 (Specification No. 09-02) to monitor, test, and repair approximately 450 miles of communication cable and appurtenances along the California Aqueduct. This contract, which also included provisions for emergency repairs, as directed, was completed in November 2011, and was accepted in August 2012.

## **Oroville Division**

### ***Oroville Operations and Maintenance Center***

A new garage shop was constructed and site work was performed for a temporary building under a contract (Specification No. 11-03) that began in August 2011. This work is part of the Oroville Facilities Relicensing project. Work is scheduled to be completed in September 2013. Acceptance is expected in March 2014.

### ***Oroville Wildlife Area***

A contract to construct ponds for wetland creation in the Oroville Wildlife Area began in August 2010 (Specification No. 10-07). Work included excavation of approximately 400,000 tons of aggregate from the dredger tailings, from which gravel will be separated and stockpiled at the Feather River Fish Hatchery for later use as spawning gravel. Work was completed in November 2011 and was accepted in March 2012. A material offset for excavated material reduced the net payments for this work.

## **North Bay Aqueduct**

### ***Napa Turnout Reservoir***

Replacement of the Napa Turnout Reservoir (Specification No. 07-01) began in April 2007. Work was completed in December 2011 and was expected in January 2012. The contract included replacing the existing tank with two 5-million gallon, steel covered tanks and installing piping and appurtenances. Acceptance was extended to January 2012 due to added corrosion monitoring equipment, a test station, and additional miscellaneous work at the valve vault.

## **South Bay Aqueduct**

### ***SBA Enlargement and Improvement***

The SBA Enlargement and Improvement projects will restore the first 16.38 miles of the SBA to the 300 cfs design flow and



increase the design capacity by up to 130 cfs. This work will enlarge the South Bay Pumping Plant to accommodate four additional 45 cfs units, construct a third discharge line, construct Dyer Reservoir, enlarge the canal, and modify associated structures. Projects are described below.

**Canal Modifications.** Various modifications were performed along Dyer Canal, Livermore Canal, Alameda Canal, and Del Valle Pipeline under a contract that began in October 2010 (Specification No. 09-16). Work included raising the canal lining, canal embankment, and operating roads; removing, modifying, installing, and constructing various structures, including overchutes, inlets, pipes, bridges, trash racks, siphons, check structures, water level measurement systems, radial gates, motors, control systems, flowmeters, and valves; and raising/refurbishing Patterson Reservoir. Work was completed in April 2012. Acceptance is expected in June 2014.

**Dyer Reservoir.** In late July 2009, construction began on the new 500 acre-foot (af) (425 af of active storage) Dyer Reservoir (Specification No. 09-01). Contract features included the reservoir embankment, inlet and outlet structures, installation of steel pipe, road construction, and a turnout structure. Work was completed in October 2012 and was accepted in December 2012.

**Siphon and Check Structure Modifications.** A contract (Specification No. 08-21) to fabricate 10 radial gates, radial gate hoist assemblies (with associated control systems), and electric actuators for SBA check structures began in January 2009. Work was completed in June 2011. Acceptance is expected in April 2013. Also included in this contract are the fabrication of stop logs and stop log storage racks, one trash removal system for Dyer-Altamont Check No. 2, and two trash removal systems for Del Valle Check No. 7.

**Transmission Line and Modifications to Banks Switchyard.** Construction of a new 69 kV transmission line from South Bay Pumping Plant to Banks Pumping Plant and modifications to the Banks Switchyard began in October 2009 (Specification No. 09-06). The new transmission line will increase the South Bay Pumping Plant power supply capacity and reliability while decreasing the unit cost of power. The Banks Switchyard modifications will allow a power step-down from 230 kV to 69 kV. Project work also includes installation of DWR-furnished transformers and equipment; furnishing and installing prefabricated control buildings, 13.8 kV distribution line poles and equipment, a new substation, and switchgear and equipment; and removing and disposing of existing 13.8 kV and 5 kV power distribution lines. Work was completed in November 2012. Acceptance is expected in April 2014.

**South Bay Pumping Plant.** The following contracts for the SBA Enlargement project at South Bay Pumping Plant continued throughout 2012:

- Specification No. 04-05: furnish 45 cfs pump and motor units for Unit Nos. 10 through 13 and one spare pump and motor. Work began in November 2004 and continued throughout 2012. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.
- Specification No. 04-20: furnish valves, actuators, and hydraulic power units. Work began in May 2005. The equipment was furnished in June 2007. Repairs to the butterfly valves were added to this contract by change order. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.
- Specification No. 05-10: furnish switchyard equipment. Work began in September 2005 and was completed in 2012. Additional work added by a contract change order furnished equipment for the Banks Switchyard

expansion to accommodate the new 69 kV transmission line from Banks Pumping Plant to South Bay Pumping Plant in 2013. Acceptance is expected in February 2014.

- Specification No. 05-05: furnish 5 kV switchgear. Work began in October 2005 and is expected to be completed in 2014. Acceptance is expected in June 2014.
- Specification No. 06-04: enlarge pumping plant initial facilities. Work began in August 2006 and is expected to be completed in 2014. Acceptance is expected in June 2014.
- Specification No. 07-02: furnish power transformers. Work began in April 2007 and was completed in September 2008. Acceptance is expected in January 2013.
- Specification No. 07-18: added work included repairs to a water system pipeline adjacent to Banks Pumping Plant. Work began in December 2007 and is expected to be completed in 2014. Acceptance is expected in June 2014.

**Surge Tanks.** Work to seismically retrofit Surge Tank Nos. 1 and 2 (Specification No. 11-11) began in October 2011 and was completed in October 2012. Acceptance is expected in February 2013. Work included modifying existing footings to add post-tensioned rock anchors, replacing steel pipe and sleeve couplings, and adding steel cladding at the existing surge tanks. Additionally, reinstallation/replacement of cross connection piping, earthwork, electrical work, application of coatings, abatement of lead-based paint, and installation of miscellaneous metalwork such as grating, ladders, cages, handrails, and hatches was performed.

**Del Valle Dam.** Bulkhead installation and removal (Specification No. 12-14) began in October 2012. Original contract work included labor, materials and construction equipment, hauling of construction equipment for installation and removal of

DWR-furnished bulkhead gate, repairing cracks inside the flood control outlet works tunnel, applying coatings to bulkhead gate and flood control outlet works tunnel slide gates, painting station markings on the inside of the Del Valle spillway tunnel, and installing a metal walkway. In addition to the original contract work, additional tasks were performed under change order. These tasks included:

- urgent repair of a leak on the SBA Pipeline at Mileposts 38.90, 33.83, and 35.34;
- Thermalito Powerplant recovery efforts;
- Clifton Court Forebay gate repair;
- open channel flowmeter at Dyer Reservoir;
- Del Valle floodgate repair;
- Hyatt Powerplant clean up;
- Oroville emergency drought river outlet valve system; and
- furnish WEKO-SEALs (internal joint seals).

Work is expected to be completed in December 2012. Acceptance is expected in January 2013.

## North San Joaquin Division

### *Skinner Fish Science Building*

The Delta Fish Survival Improvements Program (Specification No. 12-15) began in December 2012. Work consisted of construction of a cold-formed steel frame building with restroom, office space, and break room facilities. The project included the demolition of existing items, as specified: earthwork, including excavation, backfill, and grading; asphalt concrete paving; concrete and reinforcing steel; structural steel framing; steel roof trusses and metal deck; steel siding and roofing; light gauge metal framing; exterior and interior doors, windows, and skylights; rigid and batt insulation; plumbing system, fixtures, and water piping; heating, ventilating,

and air conditioning system; architectural work with cabinets and lockers; coating and painting; lighting and electrical work with exterior transformer and generator, including buried electrical conduits; debris screen system and water intake structure; chain-link fencing; traffic gates; metal beam guardrail; and precast trench drain system. Work is expected to be completed in September 2013. Acceptance is expected in October 2013.

## **San Luis Division**

### ***Dos Amigos Pumping Plant***

A contract (Specification No. 08-06) to design, manufacture, deliver, install, and test one complete automatic trash rake system and to manufacture, deliver, and install trash racks began in January 2009. Work was completed in November 2012. Acceptance is expected in February 2013.

### ***Gianelli Pumping-Generating Plant***

Heating, ventilation, and air conditioning systems will be replaced under a contract (Specification No. 10-22) that began in April 2011. Work is scheduled to be completed in January 2013. Acceptance is expected in March 2013.

### ***San Luis Canal***

Two damaged steel irrigation pipes that cross the California Aqueduct at Mileposts 113.02R and 113.44L were replaced by one high-density polyethylene pipe at Milepost 113.02 under a contract that began in September 2011 (Specification No. 11-09). Work included directional drilling, repairs to the canal liner at the existing undercrossings, grouting, and abandonment of the existing pipes. Work was completed in January 2012 and was accepted in June 2012.

### ***Chowchilla Canal Bypass Structure***

Radial gate modifications (Specification No. 12-17) began in September 2012. Work included stoplog and sandbag removal,

coatings, paint and coating removal, and radial gate modifications. Work was completed in November 2012. Acceptance is expected in February 2013.

## **Tehachapi Division**

### ***Edmonston Pumping Plant***

A contract to replace pump Units W2, W4, W6, and W8 (Specification No. 02-10) began in June 2003. Work was completed in March 2011. Delivery of additional spare parts was later added to the contract through a change order. Delivery and acceptance is expected in November 2015. Work consisted of:

- designing, fabricating, and testing a four-stage pump model and a single-stage pump model, and furnishing a pump model test program report;
- designing, manufacturing, delivering, storing, and installing four pumps to replace existing pumps;
- furnishing spare parts, auxiliary equipment, tools, and templates;
- modifying existing pump foundations, if required, for the new pumps;
- applying coatings;
- providing liaison services; and
- furnishing additional spare parts requested via change order.

Under a contract (Specification No. 11-02) that began in June 2011, the contractor will furnish and deliver spare parts for the seven Baldwin-Lima-Hamilton pumps and discharge valves at Edmonston Pumping Plant. Spare parts include labyrinth seals, shaft seals, casing and impeller wear rings, shaft sleeves, wear plates, valve seal rings and pistons, and patch bolts. Work is expected to be completed in February 2013. Acceptance is expected in June 2013.

### ***Edmonston Pumping Plant, Teerink Pumping Plant, and Control Buildings at Various Sites***

Roofing replacement (Specification No. 12-06) began in October 2012. The work includes the removal and replacement of the existing roof assemblies at Edmonston and Teerink pumping plants, Devil Canyon Penstock Control Building, and 15 other control buildings. Work is expected to be completed in 2013. Acceptance is expected in October 2013.

### ***Chrisman and Devil's Den Pumping Plants***

Site improvements (Specification No. 12-12) began in December 2012. The work included:

- repairing and coating water discharge pipe sleeve couplings and expansion joints;
- constructing temporary scaffolds with containment structures for sandblasting and cleaning the joints;
- removing sandblast dust and debris; and
- removing and replace 160 feet of 12-inch diameter steel pipe.

Work is expected to be completed in June 2013. Acceptance is expected in July 2014.

### ***Mojave Division Reaches 18A and 22B***

Work began in July 2010 to seal and pave roads and parking areas in the Southern Field Division (Specification No. 10-03). Work was completed in May 2012. Acceptance is expected in January 2013. Added work included:

- sealing and paving roads on the California Aqueduct, West Branch, Reach 29G (Los Alamos Campground Access Road, Gorman Creek Siphon, Pyramid Lake Road, and Vaquero Campground parking lot) and

- asbestos abatement and/or testing at Chrisman Pumping Plant.

### ***Cedar Springs Dam***

A contract to replace conduits and perform miscellaneous work at Cedar Springs Dam began in March 2011 (Specification No. 10-06). Work was completed in July 2012. Acceptance is expected in January 2013.

### ***Pearblossom Pumping Plant***

A contract to construct a new 20,000 square-foot Pearblossom Administration Building near Pearblossom Pumping Plant began in February 2011 (Specification No. 10-23). The new building, which was designed and will be operated to attain the Leadership in Energy and Environmental Design gold rating, will be occupied by Southern Field Division staff and Lancaster Project Headquarters personnel. Completion is scheduled for February 2013. Acceptance is expected in June 2014.

### ***Santa Ana Division East Branch Extension Phase I Improvements***

The Phase I improvements will provide additional operational flexibility, system reliability, and will reduce on-peak energy demands.

### ***Crafton Hills Reservoir Enlargement.***

A construction contract (Specification No. 11-12) to increase the reservoir's operating storage from 85 af to approximately 225 af began in December 2011 and is scheduled to be completed in November 2013. Acceptance is expected in June 2014. The work includes an earthen embankment dam with rock slope protection, access roads, grouting, a seepage collection system, geotechnical instrumentation, and mechanical aerators.



## **East Branch Extension Phase II**

Phase II of the East Branch Extension will complete the planned capacity increase for the East Branch Extension. Phase II will allow San Geronio Pass Water Agency to receive its maximum annual Table A water and allow the San Bernardino Valley Municipal Water District to increase its distribution system capacity to its Redlands and Yucaipa Valley service areas. Principal Phase II features include approximately 6 miles of new 72-inch and 66-inch diameter pipe, a new reservoir (Citrus Reservoir), a new 160 cfs pump station (Citrus Pump Station), expansion of the existing Crafton Hills Pump Station, and installation of an additional pump at Cherry Valley Pump Station.

**Citrus Reservoir.** Construction of Citrus Reservoir (Specification No. 12-02) began in June 2012 and is scheduled to be completed in 2014. Acceptance is expected in October 2014. The work to construct the reservoir includes selective demolition, excavation, compacted soil liner, hydraulic asphalt concrete, inlet works, and environmental protection.

**Mentone Pipeline.** Construction of Mentone Pipeline (Specification No. 12-03) began in July 2012 and is scheduled to be completed in 2014. Acceptance is expected in December 2014. The work to construct the pipeline includes approximately 2 miles of 72-inch buried steel pipe from Foothill Pump Station to Citrus Reservoir and approximately 3.5 miles of 66-inch buried steel pipe from Citrus Pump Station to Crafton Hills Pump Station.

**Valves.** Manufacturing, testing, and delivery of three energy dissipating valve assemblies (including electric actuators) for Citrus Reservoir began in September 2010 (Specification No. 10-10). The valves were delivered to the site in October 2012. Work is scheduled to be completed in March 2013.

Acceptance is expected in June 2014. Spare parts and special tools are included in the contract work.

Manufacturing, testing, and delivery of 14 ANSI (American National Standards Institute) butterfly valve assemblies with actuators for Citrus Pump Station, Crafton Hills Pump Station, and Cherry Valley Pump Station began in January 2011 (Specification No. 10-16). Work is scheduled to be completed in mid-2013. Acceptance is expected in June 2014. Spare parts and special tools are included in the contract work.

Manufacturing, testing, and delivery of 12 AWWA (American Water Works Association) butterfly valve assemblies with actuators for Crafton Hills Pump Station, Cherry Valley Pump Station, and Mentone Pipeline began in February 2011 (Specification No. 10-17). Work is scheduled to be completed in mid-2013. Acceptance is expected in June 2014. Spare parts and special tools are included in the contract work.

Manufacturing, testing, and delivery of 12 ANSI ball valve assemblies with actuators and 4 actuators for Citrus Pump Station, Crafton Hills Pump Station, and Cherry Valley Pump Station began in January 2011 (Specification No. 10-18). The valves were delivered to the site in October 2012. Work is scheduled to be completed in July 2013. Acceptance is expected in June 2014. Spare parts and special tools are included in the contract work.

**Transformers.** Transformers, accessories, tools, and spare parts will be manufactured, tested, and delivered for Citrus Pump Station under a contract (Specification No. 10-20) that began in March 2011. Work is scheduled to be completed in May 2015. Acceptance is expected in August 2015.



### ***Santa Ana Pipeline***

Thirteen sections (Nos. 1859–1871) of the 108-inch inside diameter Santa Ana Pipeline were repaired under a contract (Specification No. 11-07) to install a 102-inch outside diameter steel liner inside the existing pipeline. The sections are located under Burlington Northern Santa Fe railroad tracks in the city of Colton. The upper half of one additional section (No. 1858) was removed to provide a launching cradle for the steel liner. After installation of the liner, Section No. 1858 was removed and replaced with a steel section. Repairs began in August 2011. Work was completed in January 2012 and accepted in July 2012.

Construction to repair the Santa Ana Pipeline (Milepost 422.5) under Warm Creek (Specification No. 12-11) began in September 2012 and is scheduled to be completed in January 2013. Acceptance is expected in September 2013. Work includes the repair of approximately 306 feet of 102.5-inch outside diameter steel liner inside prestressed concrete cylinder pipe.

### ***Crafton Hills and Citrus Pump Stations***

Construction on the Crafton Hills Pump Station expansion and Citrus Pump Station initial work (Specification No. 12-10) began in October 2012. Work is scheduled to be completed in March 2014. Acceptance is expected in August 2014. Work includes construction of a prestressed concrete forebay water tank and pump station buildings; earthwork and shoring, demolition; installation of a hydraulic asphalt concrete liner, steel pipe and appurtenances, DWR-furnished materials, and equipment; application of coatings; and testing.

### ***West Branch***

#### ***West Branch (Reach 29G) General***

Under a change order to Specification No. 10-03, the following work began in July 2011 and was completed in May 2012.

Acceptance is expected in January 2013. Work included:

- Los Alamos Campground Road: paving, striping, signage, shoulder repair, and drainage improvements;
- Gorman Creek Siphon: embankment erosion repair along the shoulder of Pyramid Lake Road; and
- Vaquero Parking Lot: parking lot refurbishment.

### ***Oso Pumping Plant***

Work began in December 2007 to construct a 14,400 square-foot civil maintenance and mobile equipment building at Oso Pumping Plant (Specification No. 07-22). Work is scheduled to be completed in 2014. Acceptance is expected in June 2014; however, required added work, including a water treatment facility, may delay occupancy until late 2014.

## **Construction Activities in Multiple Divisions**

### ***Delta Facilities, Suisun Marsh Facilities, and California Aqueduct***

Work on a multiyear (2010 through 2012) contract to install and remove seasonal temporary rock barriers in designated South Delta waterways, provide temporary agricultural pumping facilities, place and remove flashboards at the Suisun Marsh Salinity Control Structure, dredge areas of the South Delta, and remove aquatic weeds in Clifton Court Forebay and other Delta waterways began in March 2010 (Specification No. 09-21). Work is scheduled to be completed in February 2013. Acceptance is expected in October 2013. The temporary barriers are installed to enhance water levels and circulation in the South Delta for local agricultural diversion, to assist fish migration, and to gather hydraulic data

for the design of future permanent barriers. Added work includes:

- Delta Facilities: installation of a nonphysical barrier at Georgiana Slough;
- Delta Facilities: modifications to the fish release facility at Curtis Landing;
- Delta Facilities: removal of trees at Horseshoe Bend;
- Suisun Marsh Facilities: urgent repairs to the Roaring River Slough levee;
- North San Joaquin Division: repair of cracks in the embankment of the California Aqueduct, vicinity of Milepost 88.96; and
- South San Joaquin Division: repair of a boil in the California Aqueduct, vicinity of Milepost 248.97, Reach 13B.

### ***Banks Pumping Plant and Teerink Pumping Plant***

A contract to furnish spare coils and materials for Banks and Teerink pumping plants (North San Joaquin and South San Joaquin divisions, respectively) began in February 2007 (Specification No. 06-27). The contract was extended to furnish one set of spare coils for a 30,000 horsepower motor at Pearblossom Pumping Plant (Mojave Division). Work was completed in June 2012 and accepted in August 2012.

### ***Buena Vista Pumping Plant and Chrisman Pumping Plant***

Roofing repairs at Buena Vista and Chrisman pumping plants (South San Joaquin Division) and at Warne Powerplant (West Branch) (Specification No. 10-19) began in October 2010. Work was completed in 2011. Acceptance is expected in January 2013.

### ***San Luis Canal and Coastal Branch***

Due to subsidence that caused buckling and cracking in the canal lining, a contract to remove and replace damaged portions of the concrete lining along the California Aqueduct between Mileposts 56.40 and 164.90 began

in November 2007 (Specification No. 07-20). Work was completed in May 2011 and was accepted in November 2012. Added work included:

- San Luis Canal—construction of a stability berm at Milepost 88.30;
- San Luis Canal—a dive survey and repairs at California Aqueduct Mileposts 89.02 and 138.96;
- Coastal Branch—repairs (Devil's Den Forebay);
- Coastal Branch—repairs between Mileposts 1.16 and 4.27; and
- San Luis Canal—repair of irrigation crossings at Mileposts 113.02R and 113.44L.

### ***San Joaquin and Southern Field Divisions***

Construction to seal and pave roads within the San Joaquin and Southern field divisions (Specification No. 12-08) began in August 2012. Work is scheduled to be completed in December 2013. Acceptance is expected in February 2014.

### ***Delta, San Luis, San Joaquin, and Southern Field Divisions***

Construction of the copper communications cable (Specification No. 12-04) began in June 2012. Work is scheduled to be completed in January 2014. Acceptance is expected in March 2014.

### ***Miscellaneous Construction Activities***

The following non-SWP construction activities are categorized as miscellaneous.

### ***Erosion Repair and Bank Protection***

Work began in September 2011 (Specification No. 11-06) to repair erosion along the San Joaquin River (River Mile 71.5R). The work includes fencing; protection of native trees; removal of trees, brush, and debris; earthwork; rock slope protection; installation

of erosion control fabric; asphalt, concrete, and pavement repairs; planting, seeding, and irrigation; in-stream woody materials; and plant establishment. Work is scheduled to be completed in December 2013. Acceptance is expected in March 2014.

A minor contract to repair levee erosion along the Sacramento River at Miles 36.8L, 46.7L, and 56.6L (Specification No. 12-09) began in August 2012. Work was completed in November 2012. Acceptance is expected in January 2013.

### **Habitat Restoration**

A contract to restore habitat (Specification No. 08-13) at the Colusa Sacramento River State Recreation Area began in October 2008. Work was completed in May 2012 and accepted in August 2012. This work to mitigate the Tisdale Bypass sediment removal project (Specification No. 07-14 [see Bulletin 132-09]) included planting approximately 34,000 oak trees and other plants, as well as irrigation.

In October 2010, work began on a contract (Specification No. 10-14) to restore the Sycamore Creek habitat as a condition of the nationwide permit for the Sycamore Creek sediment removal project (Specification No. 10-13). Work is scheduled to be completed and accepted in July 2014. The work includes seeding, plantings, an irrigation system, signage, and monitoring of vegetation until the plants are established.

A contract (Specification No. 11-05) to restore habitat and public access at Jensen River Ranch (Phase III) began in September 2011, was completed in March 2012, and was accepted in May 2012. This phase of the work included new decomposed granite pedestrian and horse trails, paving of an existing trail designed to accommodate users with limited mobility, wetland creation, new fencing and gates, a new irrigation system, and new corrugated metal pipe culverts to improve drainage.

### **Pumping Plant Control System Rehabilitation**

Replacement of the motor control centers and the control systems at Sutter Bypass Pumping Plants Nos. 1 through 3 will be performed under a contract that began in December 2010 (Specification No. 10-09). The contractor will remove and dispose of the existing control structures and will furnish and install new control structures, switchgear, nonsegregated busses, relays, SCADA systems, ground grids, and generators. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.

### **Replacements**

A contract (Specification No. 10-05) to replace the existing fish ladder structure and flow control structures at Willow Slough, Sutter Bypass, began in June 2010. Work is scheduled to be completed in October 2013. Acceptance is expected in December 2013.

A project to replace Weir No. 2 in the East Borrow Canal in the Sutter Bypass began in April 2011 (Specification No. 10-08). The work includes a new weir structure and fish ladder approximately 100 feet downstream from the existing weir and a control building on the levee. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.

### **Knights Landing Outfall Gates**

A project to rehabilitate the structure and update the communications system for the operation of the gates began in January 2012 (Specification No. 11-13). The structure provides controlled drainage of flood and irrigation waters into the Sacramento River, controls irrigation levels within Colusa Drain and Knights Landing Ridge Cut, and acts as a barrier for flood waters within the Sacramento River from entering the Colusa Drain and Ridge Cut. The structure's gate system and required extensive maintenance.

Consistent damage to the telephone line compromised control system reliability, and frequent malfunction of the debris boom damaged the boom's structure, causing debris to clog the gates or prevent gate closure. Work is scheduled to be completed and accepted in December 2013.

## Real Estate Activities

DWR processed a net total of \$2.6 million in payments in 2012 in support of right-of-way activities required for the construction, operation, and maintenance of the SWP. This amount represents direct payments made for the cost of fee title and easements acquired in support of SWP projects; damage payments to property owners and tenants resulting from SWP project construction activities; fees incurred for temporary permits, licenses, and leases acquired in support of SWP projects; and fair, uniform, and equitable costs to relocate utilities, businesses, and residences as required in support of SWP projects.

DWR conducted the following real estate activities from January 1 through December 31, 2012.

### SWP Acquisitions

Activities related to acquisitions were as follows:

- executed one agreement for the California Irrigation Management Information System program;
- executed an agreement with Conoco Phillips for the Milepost 62 Pipeline Relocation Project;
- executed an agreement with a landowner in Butte County to install a seismic monitoring station for the Delta Seismic Stability Evaluation Project;
- obtained a San Bernardino County excavation permit for Opal Avenue work as part of the East Branch Extension Phase II project;
- obtained a permit and executed a future revision to the permit from San Bernardino County Flood Control District for the East Branch Extension Phase II project;
- closed escrow on Parcels EBX-3 and EBX-6 from The Metropolitan Water District of Southern California for the East Branch Extension Phase II project;
- secured consent from five utilities impacted by construction of the East Branch Extension Phase II project;
- secured consent from Southern California Edison for three of four proposed crossings/sites of impact for the East Branch Extension Phase II project;
- executed two owner-initiated appraisal agreements with San Bernardino County for the East Branch Extension Phase II project;
- negotiated the fee purchase of Jacinto property on behalf of project sponsor, San Bernardino Valley Municipal Water District, for additional mitigation land to be used for the East Branch Extension Phase II project;
- obtained permits from the City of San Jose, Alameda County Water District, and Eastside Union High School District to install new anodes along Piedmont Road as part of the SBA Enlargement and Improvement Project;
- executed a right-of-way agreement for damages and processed necessary payment to replace a fence as part of the SBA Enlargement and Improvement Project;
- executed the Dyer Road chip seal agreement with Alameda County related to necessary repairs to Dyer Road caused by construction activities associated with the SBA Enlargement and Improvement Project;
- executed 18 right-of-way agreements for damages to property and reimbursement of expenses with landowners affected by the unintentional release of water as part



- of the SBA Milepost 33.83 Emergency Response Project;
- processed 60 claims for damages to property and reimbursement of expenses and the submittals for payment;
- scheduled and coordinated five site inspections with each affected landowner (once with an adjuster), and initial and follow-up inspections by a licensed property inspector and mold experts to establish baseline conditions and data and determine potential impacts of accidental water discharge at SBA Milepost 33.83;
- executed a power usage agreement with a private landowner as part of the 2012 Georgiana Slough nonphysical fish barrier study;
- executed an amended license agreement with Union Pacific Railroad to construct the Brad B. Freeman bike trail under an existing train trestle crossing the Thermalito Diversion Pool;
- obtained a quitclaim deed from Towne Exploration Company to clear rights over Parcel 322 in the Suisun Marsh and DWR Parcel No. SML-144 as part of the Fish Restoration Program Agreement;
- coordinated, tracked, and scheduled approximately 150 site visits by technical staff in support of the NBA Alternate Intake Project in Solano and Yolo counties;
- obtained an encroachment permit from Reclamation District 341 to conduct studies at SWP fish release sites (Curtis Landing);
- obtained State Lands Commission approval to conduct studies at SWP fish release sites (Curtis Landing); and
- obtained an encroachment permit from San Bernardino County Flood Control District necessary for the Santa Ana Pipeline Repair Project, 2012.

## Temporary Permits

DWR obtained 41 temporary permits including:

- Doughty Cut Flow Monitoring Project, 2;
- East Branch Extension Phase II project, 1;
- River restoration project, 15;
- SBA Improvement and Enlargement Project, 2;
- North Central Region Office—coordinated temporary entry permits, 3;
- Temporary Barriers Project, 4;
- South Delta Improvements Program—water seepage monitoring stations, 2;
- Del Valle Fault Survey Project, 1;
- Lake Perris Dam Remediation Project, 3;
- Prospect Island Restoration Project, 1;
- Roaring River Slough Distribution System Project, 2;
- South Delta Improvements Program—predatory fish study, 1; and
- Cantua Creek Stream Group Improvements Project, 4.

## SWP Property Management

Property management activities during 2012 were as follows:

- managed leasing activities of SWP nonoperating properties, which produced \$878,276;
- processed 25 encroachment permit applications and executed 26;
- collected fees of \$333,000 for review and inspection costs related to encroachment permit applications; and
- coordinated review of 12 tentative tract map developments within 1 mile of the California Aqueduct.

## SWP Appraisals

In calendar year 2012, 26 percent of total appraisal assignments (12 of 46) completed



by DWR were exclusively for the SWP. These assignments included the following:

- Alameda County Flood Control and Water Conservation District, Zone 7 conveyance project, one appraisal;
- rock storage and transfer facilities, five appraisals and one review;
- East Branch Extension Phase II, reviewed one owner-initiated appraisal;
- Arroyo Pasajero, Water Detention Basin Project, Phase II, one appraisal;
- Milepost 62 relocation, two appraisals; and
- DHCCP, one appraisal update.

**Table 12-1 Design Activities, January 1, 2012, through December 31, 2012, by Division**

Division and Facility	Design Activity	Date Design Began	Design Actual/ Estimated Completion Date
<b>Oroville Division</b>			
Brad B. Freeman Bike Trail	Bike trail realignment—design	January 2009	May 2012
Oroville and Thermalito dams	Radial gates structural re-evaluation	July 2011	June 2013
<b>Delta Facilities</b>			
Fish screens at Sherman and Twitchell islands	New fish screens at existing siphons—10 sites	September 2007	On hold
Frank’s Tract	Pilot project—design	November 2007	December 2012
<b>North Bay Aqueduct</b>			
North Bay Aqueduct	Alternate intake study	October 2008	February 2014
<b>South Bay Aqueduct</b>			
South Bay Aqueduct Enlargement	Furnish and install 69 kV transmission line and 13.8 kV distribution line and Banks switchyard modifications	October 2006	September 2012
<b>San Luis Division</b>			
Sisk Dam	Seismic re-evaluation study	July 2007	March 2013
<b>South San Joaquin Division</b>			
Teerink, Chrisman, and Buena Vista pumping plants	Furnish and install 230 kV SF6 power circuit breakers	October 2009	March 2012
Edmonston, Chrisman, Teerink, and Buena Vista pumping plants	Replace septic tanks, sewage piping, and pumps	August 2007	April 2012
	Replace emergency generator, San Joaquin Field Division	June 2012	September 2014
	Furnish and install annunciator panels	February 2012	September 2013
Aqueduct Turnouts	Design and furnish platforms	July 2011	November 2012
San Joaquin Field Division	Emergency generator replacement	October 2012	On hold
<b>East Branch Enlargement</b>			
East Branch Enlargement Phase II	Preliminary design and environmental documents	March 2007	On hold
<b>Santa Ana Division</b>			
East Branch Extension Phase II	Project planning and engineering feasibility studies	July 2008	September 2012
Perris Dam	Embankment remediation	January 2007	March 2013
	Emergency release extension	October 2006	December 2013
	Outlet tower study	January 2007	December 2012
<b>West Branch</b>			
Pyramid Dam	Radial gates structural re-evaluation	July 2011	June 2013
<b>Miscellaneous</b>			
Sutter Bypass	Motor control center replacement	August 2008	December 2012
	Pumping plant control systems rehabilitation	August 2008	September 2012

**Table 12-1 Design Activities, January 1, 2012, through December 31, 2012, by Division**

<b>Division and Facility</b>	<b>Design Activity</b>	<b>Date Design Began</b>	<b>Design Actual/ Estimated Completion Date</b>
Early implementation program	Review	October 2008	June 2012
State Water Project	Seismic loading criteria study	January 2010	June 2012
Los Robles Bridge (not part of seismic program)	Seismic analysis	August 2005	March 2013
Cache Creek Levee Mile 3.9 and Levee Mile 4.2	Emergency levee repair	January 2007	December 2012

**Table 12-2 Construction Activities, January 1, 2012, through December 31, 2012, by Division**

Sheet 1 of 3

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (Notice to Begin Work)	Acceptance Date (expected or actual)	Contract Costs (in thousands of dollars)
<b>State Water Project—General</b>				
State Water Project Supervisory Control and Data Acquisition System	Replace remote terminal units (08-12)	May 2009	May 2015	12,112
Communication Cable	Monitor, test, and repair copper communication cable and voice and data equipment (09-02)	July 2009	August 2012	1,173
<b>Oroville Division</b>				
Oroville Operations and Maintenance Center	Build new garage shop and perform site work (11-03)	August 2011	March 2014	1,427
Oroville Wildlife Area	Construct ponds for wetland creation (10-07)	August 2010	March 2012	0
<b>North Bay Aqueduct</b>				
Napa Turnout Reservoir	Replace reservoir (07-01)	April 2007	January 2012	11,055
<b>South Bay Aqueduct</b>				
South Bay Aqueduct Enlargement and Improvement				
Dyer Canal, Livermore Canal, Alameda Canal, and Del Valle Pipeline	Perform canal modifications (09-16)	October 2010	June 2014	26,302
Dyer Reservoir	Construct Dyer Reservoir (09-01)	July 2009	December 2012	16,666
Siphon and Check Structure Modifications	Furnish check structure equipment (08-21)	January 2009	April 2013	3,387
Transmission Line and Modifications to Banks Switchyard	Construct 69 kV transmission line and modify Banks Switchyard (09-06)	October 2009	April 2014	8,143
South Bay Pumping Plant	Furnish 45 cfs pump and motor units and one spare pump and motor (04-05)	November 2004	June 2014	7,370
	Furnish valves, actuators, and hydraulic power unit (04-20)	May 2005	June 2014	2,258
	Furnish switchyard equipment (05-10)	September 2005	February 2014	1,303
	Furnish 5 kV switchgear (05-05)	October 2005	June 2014	3,608
	Construct pumping plant enlargement—initial facilities (06-04)	August 2006	June 2014	16,704
	Furnish power transformers (07-02)	April 2007	January 2013	4,647
Surge Tanks	Complete pumping plant enlargement (07-18)	December 2007	June 2014	22,401
	Seismically retrofit Surge Tank Nos. 1 and 2 (11-11)	October 2011	February 2013	4,503
Del Valle Dam	Bulkhead installation and removal (12-14)	October 2012	January 2013	76,658
<b>North San Joaquin Division</b>				
Skinner Fish Science Building	Delta Fish Survival Improvements Program (12-15)	December 2012	October 2013	5,498
<b>San Luis Division</b>				
Dos Amigos Pumping Plant	Replace trash rake system and trash racks (08-06)	January 2009	February 2013	3,396

**Table 12-2 Construction Activities, January 1, 2012, through December 31, 2012, by Division**

Sheet 2 of 3

<b>Construction Division and Facility</b>	<b>Construction Contract (Specification Number)</b>	<b>Starting Date (Notice to Begin Work)</b>	<b>Acceptance Date (expected or actual)</b>	<b>Contract Costs (in thousands of dollars)</b>
Gianelli Pumping-Generating Plant	Replace heating, ventilation, and air conditioning system (10-22)	April 2011	March 2013	574
San Luis Canal	Replace irrigation crossings, Milepost 113 (11-09)	September 2011	June 2012	242
Chowchilla Canal Bypass Structure	Radial gate modifications (12-17)	September 2012	February 2013	213
<b>Tehachapi Division</b>				
Edmonston Pumping Plant	Replace pumps, Units W2, W4, W6, and W8 (02-10)	June 2003	November 2015	35,000
	Furnish and deliver spare parts (11-02)	June 2011	June 2013	5,431
Edmonston Pumping Plant, Teerink Pumping Plant, and Control Buildings, various sites	Roofing replacement (12-06)	October 2012	October 2013	1,979
Chrisman Pumping Plant and Devil's Den Pumping Plant	Site improvements (12-12)	December 2012	July 2014	4,359
<b>Mojave Division</b>				
California Aqueduct Reaches 18A and 22B	Seal and pave roads and parking areas (10-03)	July 2010	January 2013	3,149
Cedar Springs Dam	Replace conduits and perform miscellaneous work (10-06)	March 2011	January 2013	929
Pearblossom Pumping Plant	Construct 20,000 square-foot Leadership in Energy and Environmental Design gold-rated administration building (10-23)	February 2011	June 2014	13,586
<b>Santa Ana Division</b>				
East Branch Extension Phase I Improvements				
Crafton Hills Reservoir Enlargement	Increase operating storage of the reservoir (11-12)	December 2011	June 2014	8,377
East Branch Extension Phase II				
Citrus Reservoir	Construct new reservoir (12-02)	June 2012	October 2014	19,654
Mentone Pipeline	Construct pipeline from Foothill Pump Station to Citrus Reservoir and from Citrus Pump Station to Crafton Hills Pump Station (12-03)	July 2012	December 2014	42,729
Valves				
	Manufacture, test, and deliver 3 energy dissipating valves for Citrus Reservoir (10-10)	September 2010	June 2014	700
	Manufacture, test, and deliver 14 ANSI butterfly valves for Citrus, Crafton Hills, and Cherry Valley pump stations (10-16)	January 2011	June 2014	1,320
	Manufacture, test, and deliver 12 AWWA butterfly valves for Crafton Hills and Cherry Valley pump stations and Mentone Pipeline (10-17)	February 2011	June 2014	550
	Manufacture, test, and deliver 12 ANSI ball valves for Citrus, Crafton Hills, and Cherry Valley pump stations (10-18)	January 2011	June 2014	3,300
Transformers	Manufacture, test, and deliver transformers and accessories for Citrus Pump Station (10-20)	March 2011	August 2015	793



**Table 12-2 Construction Activities, January 1, 2012, through December 31, 2012, by Division**

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (Notice to Begin Work)	Acceptance Date (expected or actual)	Contract Costs (in thousands of dollars)
Santa Ana Pipeline	Repair 13 sections of pipeline (11-07)	August 2011	July 2012	1,419
	Repair pipeline, Mileposts 422.5 & 425.3, under Warm Creek (12-11)	September 2012	September 2013	2,955
Crafton Hills Pump Station and Citrus Pump Station	Pump station expansion and initial construction (12-10)	October 2012	August 2014	25,566
<b>West Branch</b>				
West Branch (Reach 29G) General	Construct road and embankment improvements (10-03 change order)	July 2011	January 2013	3,149
Oso Pumping Plant	Construct civil maintenance and mobile equipment building (07-22)	December 2007	June 2014	4,048
<b>Multiple Divisions</b>				
Delta Facilities, Suisun Marsh Facilities, and California Aqueduct	Install and remove temporary rock barriers—2010 to 2012 (09-21)	March 2010	October 2013	19,530
Banks Pumping Plant and Teerink Pumping Plant	Furnish spare coils and materials (06-27)	February 2007	August 2012	2,551
Buena Vista Pumping Plant and Chrisman Pumping Plant	Roofing repairs (10-19)	October 2010	January 2013	1,041
San Luis Canal	Repair canal lining, Mileposts 56.40 to 164.90 (07-20)	November 2007	November 2012	8,386
San Joaquin and Southern field divisions	Seal and pave roads (12-08)	August 2012	February 2014	4,918
Delta, San Luis, San Joaquin, and Southern field divisions	Copper communications cable—voice and data equipment—monitoring, testing, and repair—California Aqueduct (12-04)	June 2012	March 2014	953
<b>Miscellaneous Activities (Non-SWP)</b>				
San Joaquin River Mile 71.5R	Repair levee erosion and protect banks (11-06)	September 2011	March 2014	3,571
Sacramento River Miles 36.8L, 46.7L, and 56.6L	Levee erosion repair; minor contract (12-09)	August 2012	January 2013	311
Colusa Sacramento River State Recreation Area	Restore habitat (08-13)	October 2008	August 2012	942
Sycamore Creek	Restore habitat (10-14)	October 2010	July 2014	428
Jensen River Ranch (Phase III)	Restore habitat (11-05)	September 2011	May 2012	733
Sutter Bypass	Replace motor control centers and control system at Pumping Plant No. 1, Pumping Plant No. 2, and Pumping Plant No. 3 (10-09)	December 2010	June 2014	6,830
Sutter Bypass, Willow Slough	Replace existing fish ladder (10-05)	June 2010	December 2013	3,340
Sutter Bypass, East Borrow Canal	Replace Weir No. 2 (10-08)	April 2011	June 2014	6,570
Knights Landing Outfall Gates	Replace gates, valves, seals, motor controls, and related apparatus (11-13)	January 2012	December 2013	2,066



## Chapter 13 Recreation

*Windsurfing on Lake Perris.*

## Significant Events in 2012

The Department of Water Resources (DWR), along with the California Department of Parks and Recreation (California State Parks), Central California Irrigation District, San Luis & Delta-Mendota Water Authority, San Joaquin River Water Authority, Bureau of Reclamation (Reclamation), and the San Joaquin River Exchange Contractors hosted the first C.A.S.T. (Catch A Special Thrill) for Kids fishing event at O'Neill Forebay, which paired 16 children with special needs with local fishermen for a day of fishing.

DWR and California State Parks helped support, through a contract with the Oroville Chamber of Commerce, the annual Oroville Salmon Festival. This one-day fall event was held at the Feather River Fish Hatchery, downtown Oroville, and the Feather River Nature Center, and was attended by an estimated 10,000 participants.

The Davis-Dolwig Act (DDA) was amended to continuously appropriate \$10 million per year to DWR—\$2.5 million for past unreimbursed State Water Project (SWP) Recreation and Fish and Wildlife Enhancement (RFWE) costs, incurred by DWR through December 31, 2011, and the remaining \$7.5 million primarily to fund DWR's ongoing annual joint SWP RFWE costs.

*Information for this chapter was provided by the Division of Integrated Regional Water Management, Public Affairs Office, Division of Environmental Services, and the State Water Project Analysis Office.*



The State Water Project (SWP) is a multipurpose project that provides recreational benefits to millions of Californians. In addition to providing water supply, flood control, and habitat for fish and wildlife, the SWP offers extensive and varied recreational opportunities—tours, sightseeing, fishing, hunting, picnicking, camping, boating, water skiing, bicycling, hiking, and swimming. Under the Davis-Dolwig Act (DDA), these recreational opportunities, as well as fish and wildlife enhancements, are not allocable as water and power costs to the SWP water contractors. They are financed by Department of Water Resources' (DWR) existing authorities under the Burns-Porter Act and appropriations from the Legislature specifically for these purposes.

## Recreation Areas

The SWP has 37 developed recreation areas, or sites, throughout California, including 18 developed fishing access sites. Figure 13-1 shows the name and location of each area.

## Recreation Use

Since the SWP began delivering water in 1962, nearly 231 million recreation days have been recorded at SWP recreation facilities. A recreation day is defined as one individual user visiting a recreation site along the SWP within all or part of a one-day period.

In 2012, SWP facilities supported an estimated 4.1 million recreation days of use (see Table 13-1), up less than one percent from 2011 and down slightly from the 4.3 million days reported in 2010.

Most SWP recreation use was concentrated at the lakes and major reservoirs, with 37 percent occurring in the Oroville Field Division and 45 percent occurring in the Southern Field Division.

Attendance was mixed at SWP reservoirs. The largest two increases in attendance in 2012 occurred at Lake Davis (40 percent) and Silverwood Lake (28 percent). Lake Perris also experienced an 11 percent increase in

use from 2011 despite the continued low water levels implemented and maintained as a result of Perris Dam safety concerns. This was after a 6.8 percent decrease in attendance between 2010 and 2011.

Two of the three visitors centers experienced large increases in visitation. Romero and Vista del Lago saw a 5.7 percent and 6.8 percent increase, respectively.

Visitation at DWR's three SWP educational visitor centers totaled:

- 82,400 recreation days at Lake Oroville Visitors Center;
- 143,100 recreation days at Romero Overlook Visitors Center, San Luis Reservoir; and
- 166,500 recreation days at Vista del Lago Visitors Center, Pyramid Lake.

Overall, recreation usage of approximately 4.1 million recreation days at the SWP reservoirs listed in Table 13-1 contributed significantly to the more than 64 million day-use visitors reported at the 280 units of the California State Park System in fiscal year 2012–2013.



Figure 13-1 Names and Locations of SWP Recreation Areas



**Table 13-1 Estimated Recreation Days in 2012, by Field Division and Facility**

Field Division and Facility	Recreation Days (rounded)	
<b>Oroville Field Division</b>		
Frenchman Lake	59,700	e
Antelope Lake	29,400	e
Lake Davis	34,500	e
Lake Oroville and Thermalito Forebay	829,100	
Thermalito Afterbay and Oroville Wildlife Area	290,900	
Feather River Fish Hatchery	189,300	
Lake Oroville Visitors Center	82,400	
<b>Subtotal</b>	<b>1,515,300</b>	
<b>Delta Field Division</b>		
Lake del Valle	407,700	
Bethany Reservoir	8,200	e(1)
Fishing Access Site:		
Niels Hansen	100	e(1)
California Aqueduct:		
Walk-in Fishing	100	e(1)
Bikeway	100	e(1)
White Slough Wildlife Area	12,500	e(1)
<b>Subtotal</b>	<b>428,700</b>	
<b>San Luis Field Division</b>		
San Luis Reservoir SRA: San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	173,300	
Romero Overlook Visitors Center	143,100	
California Aqueduct:		
Walk-in Fishing	200	e(2)
Wildlife Areas	500	e(2)
<b>Subtotal</b>	<b>317,100</b>	
<b>San Joaquin Field Division</b>		
Fishing Access Sites: Kettleman City, Lost Hills, Buttonwillow, and California Aqueduct Walk-in Fishing	17,900	e
<b>Subtotal</b>	<b>17,900</b>	
<b>Southern Field Division</b>		
Silverwood Lake	333,000	
Lake Perris	630,100	
Vista del Lago Visitors Center	166,500	
Pyramid Lake	117,100	
Castaic Lake and Castaic Lagoon	582,400	
Fishing Access Sites:		
Quail Lake	1,600	e(1)
77th Street East	30	e(1)
Longview Road	200	e(1)
California Aqueduct:		
Walk-in Fishing	1,900	e(1)
Bikeway	6,200	e(1)
<b>Subtotal</b>	<b>1,839,030</b>	
<b>Total for Recreational Sites</b>	<b>3,726,030</b>	
<b>Total for Visitors Centers</b>	<b>392,000</b>	
<b>Grand Total</b>	<b>4,118,030</b>	

Note: These values are provided by facility operators, and numerous other sources, and vary in their degree of accuracy. Recreation days are based on counts except where marked "e," which are based on partial data: e(1) these locations are not regularly monitored and are visually monitored only. It is likely that these areas are used significantly more than what is represented here, but it is difficult to ascertain a realistic annual use; e(2) fishing access on or adjacent to the dams has been eliminated due to security concerns resulting in a significant decrease in attendance in the general area. Beginning in 2011, all locations within the Southern Field Division are being reported on a calendar-year basis.

## Facilities

### Planning

#### Lake Oroville State Recreation Area

DWR and the California Department of Parks and Recreation (California State Parks) made the following plans in 2012 for future improvements to the facilities at Lake Oroville State Recreation Area (LOSRA):

- install new energy efficient lighting in the lobby and overhead lighting in the storage bays at the North Forebay Aquatic Center;
- replace 22 failing 480-watt light fixtures with bi-level, energy efficient fixtures using 130- and 70-watt light fixtures in the Lime Saddle marina parking lot;
- perform asphalt repairs and maintenance at Bidwell Canyon Campground; and
- realign the Brad B. Freeman Trail under the Union Pacific Railroad bridge over the Thermalito Diversion Pool.

#### Silverwood Lake State Recreation Area

California State Parks has four projects to improve accessibility for users with limited mobility. These project plans concentrate on improving the Cleghorn Day Use Area, Sawpit Day Use Area, and Mesa Campground.

In addition, the California State Parks Southern Service Center is working on design plans for permanent exhibits for the Silverwood Nature Center, which is tentatively scheduled for installation during the spring of 2014.

### New Facilities

#### Lake Davis Recreation Area

DWR funded and installed a new single-vault restroom to accommodate users with limited mobility. The restroom is near the Lake Davis informational kiosk on the Grizzly Valley Dam.

### **Lake Oroville State Recreation Area**

California State Parks was able to fund two projects in 2012. A sewage treatment plant was installed at the Lake Oroville Marina at Lime Saddle. California State Parks also completed the Bloomer equestrian campsite and made the final connection of the North Fork Trail to the campsites; this was grant funded.

### **Lake del Valle State Recreation Area**

East Bay Regional Park District added a new storage area to their storage yard near the park offices.

### **Silverwood Lake State Recreation Area**

California State Parks added three new modular residences to its residential area for State employee housing in 2012.

## **Improvements to Facilities**

### **Lake Oroville State Recreation Area**

California State Parks made significant trail improvements during 2012 at LOSRA. This included completion of the Potters Ravine Loop trail connector. DWR and California State Parks worked together on the realignment of the Brad B. Freeman Trail along the Diversion Pool of the Feather River. Additionally, three new steel pedestrian bridges replaced three wooden bridges along this bike trail north of the Power Canal.

DWR also began construction of the Upper Overlook Day Use Project at Oroville Dam, which included a 32-foot shade ramada, an interpretive panel, and hardscape and landscape improvements. The project was partially funded by a Land and Water Conservation Fund grant. This long-term project is scheduled for completion in late 2013.

A stairway installation project was initiated at Monument Hill. The stairway will connect the lower boat ramp parking lot to the upper parking lot and restroom facilities.

This project is scheduled for completion in early 2013.

Interior LED lighting was installed at the Lake Oroville Visitors Center exhibit area.

Additionally, California State Parks rebuilt and replaced redwood benches at the Loafer Creek Campfire Center.

The Fuel Load Management Plan for Federal Energy Regulatory Commission (FERC) Project No. 2100 lands was finalized in September 2012. This plan identifies fuel load reduction treatments and locations to provide land and resource managers with a strategic approach to minimize the potential for wildfire within the FERC Project Boundary. Approximately 31 percent of land uses in the FERC Project Boundary are recreation related—including boating, fishing, camping, picnicking, horseback riding, hunting, etc. By reducing the amount of wildfire fuels, the likelihood of a catastrophic wildfire is minimized.

### **Lake del Valle State Recreation Area**

East Bay Regional Park District replaced two water fountains, one at the east concession area and the other at Gray Pine. Both were replaced with high/low water fountains that accommodate users with limited mobility.

A section of asphalt pathway was replaced from Oak Point to the east concession area.

An ongoing campground improvement project was completed at Hetch Hetchy, Venados, and Cedar campgrounds.

Windows were added to both lifeguard stations at the swim beach, and dual-pane windows were installed at the park office. The park office electrical service was also upgraded, and a new HVAC system was installed.

### ***Pyramid Lake Recreation Area***

Parks Management Company (PMC) began managing the recreation facilities at Pyramid Lake Recreation Area on January 1, 2011. This allowed Vaquero Beach to be open to the public seven days a week for the first time in 5 years. PMC also placed the campgrounds on a reservation system, making them more widely available. Major repairs and improvements to the facilities continued through 2012.

PMC began offering 5 gas-powered and 10 non-motorized boat rentals at Emigrant Landing. More gas-powered vessels will be added in 2013.

In addition, the following repairs were completed in 2012:

- Vaquero Beach restrooms were repaired and painted, including the installation of new partitions, lighting, and signage. Both Emigrant Landing restrooms and all campground restrooms received new lighting and hardware;
- In 2011, PMC planted more than 100 trees throughout the Pyramid Lake and Los Alamos campgrounds. In 2012, the irrigation system was completed and additional trees were planted at Vaquero Beach;
- New information boards, roadway and facility signs, partitions, and lighting were completed in 2012. In addition, all new site markers and reflectors were installed in the campgrounds;
- New pedestal barbecues were installed at Spanish Point, Serrano, and Emigrant Landing. Group pedestal barbecues were also installed in locations where they had been previously missing or damaged.

### ***Silverwood Lake State Recreation Area***

California State Parks made substantial improvements at Silverwood Lake State Recreation Area during 2012, with an

emphasis on making improvements for visitors with limited mobility. Three campsites were modified and improved for Americans with Disabilities Act compliance in the Old Mesa Campground. Twenty-four picnic sites were renovated and upgraded—15 to accommodate users with limited mobility. Additionally, nine picnic tables were replaced with redwood tables.

The interior lobby of the Sector Office received improvements to create a lobby/customer service area for park visitors.

Temporary exhibits were also installed at the new Silverwood Lake State Recreation Area Nature Center.

California State Parks also improved the sewer system with the removal and replacement of four lift stations and upgraded the lift station alarm system in the entire park. A back-up power system was also replaced with a new one.

### ***Lake Perris State Recreation Area***

In 2012, California State Parks performed the following improvements at Lake Perris State Recreation Area:

- recoated and painted a 5,000 gallon potable water tank on the Bernasconi side of the park;
- recoated, repaired, and painted the 250,000 gallon potable water tank on the developed side;
- completed upgrades required by Cal/OSHA to the potable water tanks, which included relocating entry hatches and upgrading the ladder safety devices;
- upgraded an electrical panel for the irrigation system raw water pumps;
- demolished the old snack bar building and constructed two new group picnic sites with shade structures;
- sealed cracks in roadways, applied slurry, and repainted road markings on the entrance road of the campground

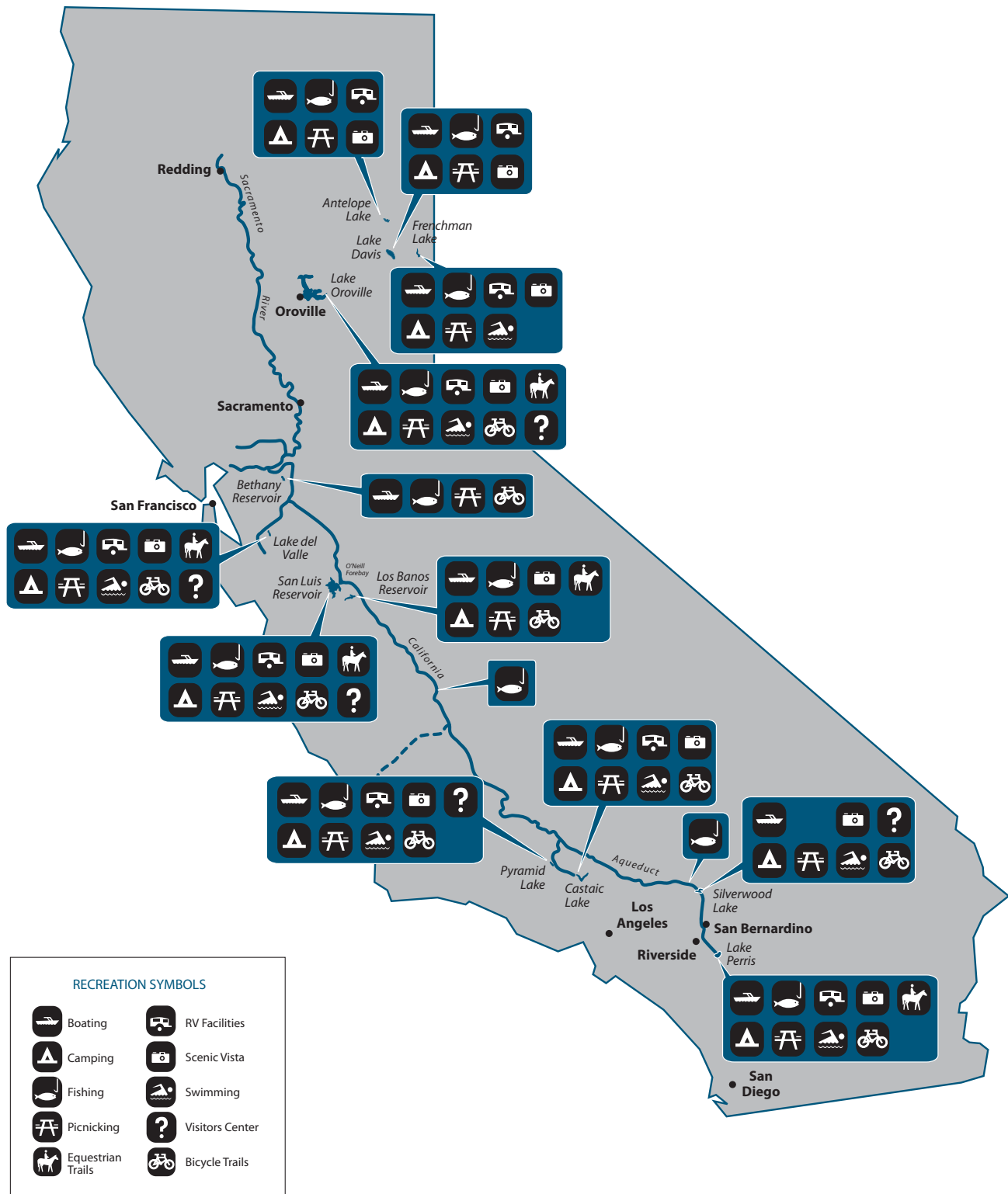


Figure 13-2 Types of Recreation along the SWP

and up to one-half mile of Vista Del Lago Road; and

- remodeled and repainted the Ranger Quad.

## Recreation Activities

The SWP, with its many reservoirs and hundreds of miles of aqueducts, offers Californians many recreational opportunities. From Antelope Lake in Northern California to Lake Perris in Southern California, the SWP includes facilities for anglers, boaters, campers, hikers, cyclists, and many others. While DWR manages the routing of water through the reservoirs, the recreational facilities are operated variously by federal, State, and local agencies and, in many cases, their private concessionaires. Visitors to these facilities can swim, water ski, picnic, and enjoy many other activities as well. See Figure 13-2 for the various types of recreation available along the SWP.

### Lake Oroville State Recreation Area

DWR, California State Parks, and other agencies sponsored a number of activities at LOSRA in 2012.

DWR co-hosted a Jack Splash Fit-N-Fun Day with the Oroville YMCA and the Feather River Rowing Club at the North Forebay Aquatic Center. Three hundred eighty-eight children came to learn the value of exercise and healthy eating habits through various activities with staff.

DWR and California State Parks helped support, through a contract with the Oroville Chamber of Commerce, the annual Oroville Salmon Festival. This one-day fall event was held at the Feather River Fish Hatchery, downtown Oroville, and the Feather River Nature Center, and was attended by an estimated 10,000 participants.

DWR co-hosted a two-week Aquatic Adventure Camp program, with the Feather River Recreation and Parks District and the

Chico Area Recreation District, for 36 local children. The children were educated in sailing, canoeing, sailboarding, proper use of safety equipment, water safety, and rescue techniques by North Forebay Aquatic Center staff.

DWR, California State Parks, and the Department of Forestry and Fire Protection hosted a C.A.S.T. (Catch A Special Thrill) for Kids fishing event for 40 children with special needs. In addition, 217 volunteers from around Oroville and Chico came to help make this event a success.

California State Parks held a trail clean-up day. It was estimated that 25 cubic yards of trash was removed from the area by 36 volunteers from the public and California State Parks.

California State Parks hosted Bidwell Bar Days at Bidwell Canyon Campground. The event was attended by 480 park visitors who were treated to a day in the life of the old west.

California State Parks hosted Frontier Christmas at the Lake Oroville Visitors Center. Visitors learned how to make pioneer crafts and pan for real gold. An estimated 755 people attended the event.

In April, approximately 300 visitors attended a wildflower festival.

A Native Ways Celebration was also held in April with 500 attendees.

Kiwanis hosted a "Hooked on Fishing, Not on Drugs" free kids' fishing day at Bedrock Park in the spring with support from DWR's Public Affairs Office and Oroville Field Division staff. More than 1,300 people attended the half-day event.

DWR's Public Affairs Office staff and Oroville Field Division staff participated in a booth, as



did the YMCA and Oroville Salmon Festival organizers, to support Feather Fiesta Days.

DWR and California State Parks partnered with several other State and local agencies and organizations to support a Fourth of July fireworks show at Lake Oroville, which was attended by several thousand people.

### Lake del Valle State Recreation Area

East Bay Regional Park District sponsored the following activities in 2012:

- Newfoundland dog water tests;
- Tri-Valley Masters Open Water Swim, which attracted 650 swimmers;
- Ohlone 50k trail run, with 300 attendees;
- Badger Cove Half Marathon/10K/5K run, with more than 1,000 participants;
- Two Day Town music festival with 1,500 attendees;
- 15 campfire programs, which served 2,233 attendees;
- 29 school programs, which served 1,263 children;
- 10 Regional in Nature (RIN) programs led by naturalists serving 180 individuals, and 26 non-RIN programs, which served 557 individuals;
- a Community Overnight Camping Program, which served 214 campers;
- a “Park’n It” Summer Day Camp Program, which served 355 children;
- Coastal Cleanup 2012, where 175 volunteers cleaned up the lake shoreline contributing more than 612 hours and removing 402 pounds of trash;
- two fishing programs, which served 14 participants;
- with DWR, the Richmond Police Athletic League, the City of Antioch, and the Livermore Area Recreation and Park District, co-sponsored four Aquatic Adventure Camps that served 160 children; and

- with DWR, hosted the annual C.A.S.T. for Kids fishing event, which paired 35 children with special needs with experienced fishermen for a day of fishing on Lake del Valle.

### San Luis State Recreation Area

DWR, along with California State Parks, the Central California Irrigation District, San Luis & Delta-Mendota Water Authority, San Joaquin River Water Authority, Bureau of Reclamation, and the San Joaquin River Exchange Contractors hosted the first-ever C.A.S.T. for Kids fishing event on O’Neill Forebay, which paired 16 children with special needs with local fishermen for a day of fishing.

### Pyramid Lake Recreation Area

Parks Management Company held two night fishing events on Pyramid Lake.

### Castaic Lake State Recreation Area

The County of Los Angeles Department of Parks and Recreation and the Friends of Castaic Lake sponsored the following activities:

- two Junior Lifeguard Programs for 487 participants ages 9 to 17 who learned lifeguarding, first aid, CPR skills, and water safety;
- three Aquatic Adventure Camp sessions for 400 participants;
- five moonlight kayak classes with 104 participants ages eight and older. The participants learned about the environment at Castaic Lake, the SWP, water safety, and boat safety;
- “Splash in the Water” events with 451 children ages 7 to 14 who learned about water safety, kayaking, canoeing, standup paddleboarding, and sailing;
- one session of a FamCamp program for 35 participants to teach them about camping, leave-no-trace principles, water safety, and kayaking;

- 31 standup paddleboarding classes to a total of 370 participants every Saturday from May through October, with an average class size of 10 to 25 participants;
- 64 kayak clinics for a total of 553 participants every Saturday from May through October, teaching about water safety, boating safety, and the environment at Castaic Lake, for participants aged eight and older; and
- a C.A.S.T. for Kids fishing event for 41 children with special needs, which was co-hosted by DWR.

### Silverwood Lake State Recreation Area

California State Parks sponsored the following activities at Silverwood Lake State Recreation Area:

- Bald Eagle Barge Tours on Saturdays and Sundays from January through March, where monthly eagle counts were taken;
- one Adopt-a-School program for 100 participants;
- five school barge tours for approximately 105 participants each;
- a Coastal Cleanup Day with 12 volunteers that cleaned up the lake shoreline;
- 10 campfire programs with 75 or more visitors each;
- the Second Annual Apple Festival, held near the Silverwood Historic Apple Orchard, which included apple picking, demonstrations of an antique apple press, and apple cooking and canning demonstrations. Live music, a barbecue lunch, a raffle, and a preview of exhibits in the Silverwood Lake State Recreation Area Nature Center were available to the 250 participants;
- several Outdoor Youth Connection events at Silverwood Lake for teens ages 13 to 17 to experience outdoor activities, teambuilding, and camping, and to develop leadership and life skills; and

- a C.A.S.T. for Kids fishing event, which paired 26 children with special needs with experienced fishermen for a day of fishing on the lake, co-hosted by DWR.

### Lake Perris State Recreation Area

In 2012, California State Parks sponsored the following activities at Lake Perris State Recreation Area:

- 12 Junior Ranger Programs conducted by a State Park Interpreter for participants ages 3 to 15. Programs were held Saturday mornings from Memorial Day weekend through Labor Day;
- 12 campfire programs, with 20 to 65 attendees at each program;
- a 4-week Junior Lifeguard Program for 26 participants, ages 8 to 15. Participants learned about natural and cultural resources, first aid, CPR, and aquatic safety education;
- a National Bald Eagle count;
- three sessions of Aquatic Adventure Camp, co-hosted by DWR, with more than 150 children learning basic first aid, CPR, basic aquatic emergency management, swimming strokes, and enjoying a variety of aquatic recreation activities; and
- a C.A.S.T. for Kids fishing event, co-hosted by DWR, which paired 30 children with special needs with experienced fishermen for a day of fishing on the lake.

### Oroville Recreation Plan

The Oroville Facilities, including Lake Oroville State Recreation Area, Oroville Wildlife Area, and adjacent DWR facilities, are operated in conformance with the 1993 Amended Recreation Management Plan that was approved by FERC in its 1994 Order 2100-054. In 2006, DWR and its Settlement Agreement signatories submitted a new Settlement Agreement Recreation Management Plan (SARMP, March 2006) for

FERC approval. The approved SARMP will be implemented when the new hydropower license is issued by FERC, currently expected sometime in 2014 or later.

Additional need-based recreation improvements identified and proposed in the SARMP are anticipated to be constructed after the new FERC license is issued. The new license terms and conditions are expected to be consistent with the proposed SARMP. In the meantime, DWR and its Davis-Dolwig Act (DDA) collaborating partners, California State Parks, California State Parks' Division of Boating and Waterways (formerly the Department of Boating and Waterways), and the Department of Fish and Wildlife (DFW), will continue to operate Oroville Facilities' recreational installations consistent with the existing FERC license (renewed annually) and its associated 1993 Amended Recreation Management Plan.

## Fish Plantings

In 2012, DFW planted 826,600 fish in SWP reservoirs (see Table 13-2). This was 8.6 percent more than the 761,200 fish planted in 2011. In 2010, DFW planted 538,500 fish; and 879,500 fish were planted in 2009. Over a 3-year period, DFW averaged 708,767 fish planted per year.

## SWP Deliveries for Recreation

DWR has an agreement with California State Parks to provide onshore recreation water at several SWP facilities in an amount prorated to the yearly SWP Table A allocation. Per the 65 percent SWP Table A allocation for 2012, maximum diversion amounts under the onshore recreation agreement were allocated at 65 percent, or a total of 4,409 acre-feet (af), as follows: 1,788 af at San Luis Reservoir; 260 af at Lake del Valle; 1,515 af at Castaic Lake and Castaic Lagoon; 813 af at Lake Perris; and 50 af at Bethany Reservoir. Actual deliveries under

the agreement totaled 845 af as follows: 9 af at San Luis Reservoir; 150 af at Lake del Valle; 375 af at Castaic Lake; 207 af at Lake Perris; 0 af at Bethany Reservoir; and deliveries to California State Parks of 91 af at Silverwood Lake and 13 af at Pyramid Lake. Details about these deliveries is provided in Chapter 9, Water Contracts and Deliveries.

## Recreation Financing

Prior to 2001, DWR reported capital costs allocated to fish and wildlife enhancement and recreation in Bulletin 132, Appendix D, *Costs of Recreation and Fish and Wildlife Enhancement (RFWE)*. This report is no longer mandated by the Legislature. DWR initially began reporting recreation capital cost information in this bulletin for fiscal year 2000–2001.

The approach to financing RFWE in connection with the SWP is provided in the DDA (California Water Code [CWC] Sections 11900–11925, 1961) and the Burns-Porter Act (CWC Section 12937, 1959). Additionally, as early as 1953, financing for RFWE was addressed in CWC Sections 233, 345, 346, 12581, and 12582. These statutes declare that recreation at the SWP is a benefit to all the people of California and that the associated costs should be borne by all Californians. While this intent is cited in the DDA, no specific appropriation or funding source was defined. Consequently, Assembly Bill (AB) 12 in 1966, Senate Bill (SB) 1268 in 1970, and the Environmental Water Act, AB 1441 and AB 1442 in 1989, were all enacted to provide the necessary State funding for this SWP purpose. The DDA does, however, explicitly preclude DWR from including RFWE costs in the SWP charges for water and power billed to the public water agencies contracting for SWP water supply.

The Legislature has intermittently appropriated monies to meet State obligations to fund RFWE at the SWP. AB 12 appropriated \$5 million per year to DWR

**Table 13-2 Fish Planted by Department of Fish and Wildlife in 2012 (thousands)<sup>a</sup>**

Location and Size	Eagle Lake Trout	Brook Trout	Rainbow Trout	Coho Salmon	Chinook Salmon	Kokanee Salmon	Total for Lake
<b>Antelope Lake</b>							45.8
Catchables	15.3	12.0	18.5				
<b>Lake Davis</b>							178.9
Fingerlings			149.6				
Catchables	29.3						
<b>Frenchman Lake</b>							117.4
Fingerlings			83.4				
Catchables	34.0						
<b>Lake Oroville</b>							289.6
Catchables				289.6			
<b>Thermalito Forebay</b>							5.0
Catchables					5.0		
<b>Lake del Valle</b>							53.3
Fingerlings					15.0	29.9	
Catchables			8.4				
<b>Los Banos Reservoir<sup>b</sup></b>							
<b>Pyramid Lake</b>							25.5
Catchables	2.0		23.5				
<b>Castaic Lake</b>							32.4
Catchables			32.4				
<b>Castaic Lagoon<sup>b</sup></b>							
<b>Silverwood Lake</b>							39.6
Catchables	12.2		27.4				
<b>Lake Perris</b>							39.2
Catchables	6.6		32.6				
<b>Total</b>	<b>99.4</b>	<b>12.0</b>	<b>375.8</b>	<b>289.6</b>	<b>20.0</b>	<b>29.9</b>	<b>826.7</b>

<sup>a</sup> Information provided by DFW, using the following size classes: fingerlings = 16.1 or more fish per pound; sub-catchables = 6.1 to 16 fish per pound; catchables = 1 to 6 fish per pound; super-catchables = 0.99 to 0.34 fish per pound; and trophy = fewer than 0.32 fish per pound.

<sup>b</sup> No fish planted in 2012.

from \$90 million in tidelands oil and gas revenues. By the early 1980s, DWR had expended the entire \$90 million toward funding SWP RFWE obligations. SB 1268 appropriated \$55 million to California State Parks and \$5 million to DFW specifically for their responsibilities under the DDA at SWP facilities. Finally, AB 1442 appropriated \$172 million to reimburse DWR for SWP RFWE costs incurred over the previous 12 years as an offset to DWR's California

Water Fund repayment, and an additional \$30 million for SWP RFWE through 1994.

In the fiscal year 2012–2013 State budget, passed by the Legislature and effective July 1, 2012, the DDA was amended to continuously appropriate \$10 million per year to DWR. The funding was sourced from the Harbors and Watercraft Revolving Fund that is funded by fuel taxes at marinas statewide; this continuous SWP RFWE funding is



essentially a user-funded source. Of the \$10 million, \$2.5 million per year is for past unreimbursed SWP RFWE costs incurred by DWR through December 31, 2011, and the remaining \$7.5 million per year is primarily intended to fund DWR's ongoing annual joint SWP RFWE costs that are generated through DWR's statutory mandate to allocate SWP costs to their respective purposes including RFWE. These joint costs are those for facilities such as dams, which were constructed to provide multiple benefits such as flood control, water supply, power generation, and RFWE. The dam, however, cannot be physically separated into discrete elements for cost-sharing purposes, so DWR, by statute, must determine and allocate shares of such facilities to all of the respective purposes. Moreover, and by law (the DDA), the SWP RFWE purpose costs cannot be included in charges for water and power to SWP customers, so the 2012 DDA amendment fills a long-standing shortfall in SWP RFWE funding and will help ensure the great benefit provided to all Californians in the form of 5 million or more visitors per year to SWP facilities with water-focused recreation and sport-fishing opportunities.

The 2012 DDA amendment is the result of several years of close, cooperative solution development that involved the Natural Resources Agency Secretary's Office, the Department of Finance, the Legislative Analyst's Office, legislative staff, DWR, and many of DWR's long-term SWP water supply contracting public water agencies.

### Capital Cost Allocations

Table 13-3 shows capital costs allocated to RFWE and overall costs of lands acquired for recreation development through 2012. Total capital costs increased by \$1,666,055 since Bulletin 132-12 due to an increase of \$1,747,782 in 2012 and a downward adjustment of \$81,727 in years prior to 2012. The increase in 2012 included \$1,692,555 in joint costs and \$55,227 in specific costs. These costs are budgeted by DWR from funds

available for financing project construction costs. Recreation and enhancement costs not reported in this table are budgeted by several State departments and are financed by appropriations from a variety of funds.

### Accrued Interest Charges

Table 13-4 details accrued interest charges included in the costs shown in Table 13-3 and reimbursements through December 2012. These interest accruals were calculated through October 2001 on the portion of annual disbursements financed by the California Water Resources Development Bond Fund, based on the weighted average interest costs of Burns-Porter and Water System Revenue Bonds sold to date, and are reported here for historical reference. The reimbursements were included in DWR's budget as appropriations from the General Fund and are used by DWR to pay for operations, maintenance, power, and replacement costs associated with operating the SWP for RFWE.

For a more detailed discussion of these legislative provisions, and DWR's procedures for reporting and tabulating recreation and enhancement costs, please see the last Appendix D (to Bulletins 132-98, 132-99, 132-00, and 132-01).



**Table 13-3 Recreation and Enhancement Costs of the State Water Project (in dollars)**

Facility	Joint Costs Allocated to Recreation and Enhancement					B132-12 Costs	Increase/Decrease
	1952-2011 Updated	2012	Subtotal	Interest	Total		
<b>Frenchman Dam and Lake (78.5%)</b>							
California Water Resources Development Bond Fund	102,997	0	102,997	2,097	105,094	105,094	0
All Other Funds	2,719,915	3	2,719,918	0	2,719,918	2,719,915	3
<b>Antelope Dam and Lake (100%)</b>							
California Water Resources Development Bond Fund	1,033,261	0	1,033,261	113,788	1,147,049	1,147,049	0
All Other Funds	4,625,798	6	4,625,804	0	4,625,804	4,625,780	24
<b>Grizzly Valley Dam and Lake Davis (99.0%)</b>							
California Water Resources Development Bond Fund	4,003,092	0	4,003,092	486,754	4,489,846	4,489,846	0
All Other Funds	4,110,232	7	4,110,239	0	4,110,239	4,110,232	7
<b>Other Feather River Projects<sup>a</sup></b>							
California Water Resources Development Bond Fund	0	0	0	0	0	0	0
All Other Funds	746,172	1	746,173	0	746,173	746,171	2
<b>Delta Facilities</b>							
California Water Resources Development Bond Fund	0	0	0	0	0	0	0
All Other Funds	13,326,055	246,234	13,572,289	0	13,572,289	13,326,053	246,236
<b>San Luis Dam and Reservoir, O'Neill Forebay, and Los Banos Reservoir (3.4%)</b>							
California Water Resources Development Bond Fund	988,910	0	988,910	169,085	1,157,995	1,157,995	0
All Other Funds	3,533,288	5,957	3,539,245	0	3,539,245	3,533,287	5,958
<b>California Aqueduct Delta to Dos Amigos Pumping Plant (3.4%)</b>							
California Water Resources Development Bond Fund	4,467,667	0	4,467,667	897,406	5,365,073	5,365,073	0
All Other Funds	4,844,971	83,212	4,928,183	0	4,928,183	4,800,950	127,233
<b>Oroville Division (2.9%)</b>							
California Water Resources Development Bond Fund	5,725,216	0	5,725,216	1,790,491	7,515,707	7,515,707	0
All Other Funds	6,072,028	117,667	6,189,695	0	6,189,695	6,072,028	117,667
<b>Del Valle Dam and Lake del Valle (48.0%)</b>							
California Water Resources Development Bond Fund	10,546,762	0	10,546,762	6,813,560	17,360,322	17,360,322	0
All Other Funds	4,218,963	62,481	4,281,444	0	4,281,444	4,218,964	62,480
<b>California Aqueduct Dos Amigos Pumping Plant to Termini (5.7%)</b>							
California Water Resources Development Bond Fund	48,382,162	0	48,382,162	75,353,773	123,735,935	123,735,935	0
All Other Funds	91,826,836	1,176,987	93,003,823	0	93,003,823	91,952,605	1,051,218
<b>Subtotal</b>	<b>211,274,325</b>	<b>1,692,555</b>	<b>212,966,880</b>	<b>85,626,954</b>	<b>298,593,834</b>	<b>296,983,006</b>	<b>1,610,828</b>
<b>Specific Costs of Acquiring Land for Recreation Development</b>							
<b>Frenchman Dam and Lake</b>							
California Water Resources Development Bond Fund	3,379	0	3,379	160	3,539	3,539	0
All Other Funds	49,950	0	49,950	0	49,950	49,950	0
<b>Grizzly Valley Dam and Lake Davis</b>							
California Water Resources Development Bond Fund	204,475	0	204,475	17,573	222,048	222,048	0
All Other Funds	554,246	0	554,246	0	554,246	554,246	0
<b>Abbey Bridge Dam and Reservoir</b>							
California Water Resources Development Bond Fund	9	0	9	0	9	9	0
All Other Funds	9,921	0	9,921	0	9,921	9,921	0
<b>Antelope Dam and Lake</b>							
California Water Resources Development Bond Fund	3,167	0	3,167	0	3,167	3,167	0
All Other Funds	201,137	0	201,137	0	201,137	201,137	0
<b>San Luis Dam and Reservoir, O'Neill Forebay, and Los Banos Reservoir</b>							
California Water Resources Development Bond Fund	395,284	0	395,284	33,467	428,751	428,751	0
All Other Funds	867,243	0	867,243	0	867,243	867,243	0
<b>California Aqueduct Delta to Dos Amigos Pumping Plant</b>							
California Water Resources Development Bond Fund	422,681	0	422,681	158,456	581,137	581,137	0
All Other Funds	(91,879)	0	(91,879)	0	(91,879)	(91,879)	0
<b>Oroville Division</b>							
California Water Resources Development Bond Fund	7,809,509	0	7,809,509	3,673,041	11,482,550	11,482,550	0
All Other Funds	5,965,278	55,227	6,020,505	0	6,020,505	5,965,278	55,227
<b>Del Valle Dam and Lake del Valle</b>							
California Water Resources Development Bond Fund	519,425	0	519,425	448,292	967,717	967,717	0
All Other Funds	(32,202)	0	(32,202)	0	(32,202)	(32,202)	0
<b>California Aqueduct Dos Amigos Pumping Plant to Termini</b>							
California Water Resources Development Bond Fund	478,971	0	478,971	915,217	1,394,188	1,394,188	0
All Other Funds	419,088	0	419,088	0	419,088	419,088	0
<b>Castaic Dam and Lake</b>							
California Water Resources Development Bond Fund	1,954,297	0	1,954,297	3,856,203	5,810,500	5,810,500	0
All Other Funds	951,352	0	951,352	0	951,352	951,352	0
<b>Cedar Springs Dam and Silverwood Lake</b>							
California Water Resources Development Bond Fund	424,966	0	424,966	817,173	1,242,139	1,242,139	0
All Other Funds	370,164	0	370,164	0	370,164	370,164	0
<b>Perris Dam and Lake Perris</b>							
California Water Resources Development Bond Fund	1,022,313	0	1,022,313	2,033,799	3,056,112	3,056,112	0
All Other Funds	4,939,976	0	4,939,976	0	4,939,976	4,939,976	0
<b>Subtotal</b>	<b>27,442,750</b>	<b>55,227</b>	<b>27,497,977</b>	<b>11,953,381</b>	<b>39,451,358</b>	<b>39,396,131</b>	<b>55,227</b>
<b>Total Recreation and Enhancement Costs</b>							
California Water Resources Development Bond Fund	88,488,543	0	88,488,543	97,580,335	186,068,878	186,068,878	0
All Other Funds	150,228,532	1,747,782	151,976,314	0	151,976,314	150,310,259	1,666,055
<b>Total</b>	<b>238,717,075</b>	<b>1,747,782</b>	<b>240,464,857</b>	<b>97,580,335</b>	<b>338,045,192</b>	<b>336,379,137</b>	<b>1,666,055</b>

<sup>a</sup> Actual capitalized costs for facilities not yet constructed.

**Table 13-4 Calculation of Interest Accruals on California Water Resources Development Bond Fund Disbursements (in dollars at 4.610% per annum)**

Facility	1952-2011					2012					2013 Beginning of Year Balance to be Reimbursed				
	Disbursements		Reimbursements		Interest Accrual <sup>a</sup>	Disbursements		Reimbursements		Interest Accrual <sup>a</sup>	Disbursements		Reimbursements		Interest Accrual <sup>a</sup>
	WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds		WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds		WRD Bond Funds	All Other Funds	WRD Bond Funds	All Other Funds	
Frenchman Dam and Lake	102,997	2,719,915	104,900	2,719,468	2,097	0	3	0	0	0	102,997	2,719,918	104,900	2,719,468	2,097
Antelope Dam and Lake	1,033,261	4,625,798	1,140,322	4,478,932	113,788	0	6	0	0	0	1,033,261	4,625,804	1,140,322	4,478,932	113,788
Grizzly Valley Dam and Lake Davis	4,003,092	4,110,232	4,444,594	2,568,667	486,754	0	7	0	0	0	4,003,092	4,110,239	4,444,594	2,568,667	486,754
Oroville Division	5,725,216	6,072,028	7,324,529	4,570,269	1,790,491	0	117,667	0	0	0	5,725,216	6,189,695	7,324,529	4,570,269	1,790,491
Other Feather River Projects	0	746,172	0	0	0	0	1	0	0	0	0	746,173	0	0	0
Delta Facilities	0	13,326,055	0	0	0	0	246,234	0	0	0	0	13,572,289	0	0	0
Del Valle Dam and Lake del Valle	10,546,762	4,218,963	16,463,934	3,130,016	6,813,560	0	62,481	0	0	0	10,546,762	4,281,444	16,463,934	3,130,016	6,813,560
California Aqueduct Delta to Dos Amigos Pumping Plant	4,467,667	4,844,971	5,267,351	4,092,435	897,406	0	83,212	0	0	0	4,467,667	4,928,183	5,267,351	4,092,435	897,406
Sisk Dam, San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	988,910	3,533,288	1,938,244	2,725,578	169,085	0	5,957	0	0	0	988,910	3,539,245	1,938,244	2,725,578	169,085
California Aqueduct Dos Amigos Pumping Plant to Termini	48,382,162	91,826,836	113,035,518	49,410,851	75,353,773	0	1,176,987	0	0	0	48,382,162	93,003,823	113,035,518	49,410,851	75,353,773
<b>Subtotal</b>	<b>75,250,067</b>	<b>136,024,258</b>	<b>149,719,392</b>	<b>73,696,216</b>	<b>85,626,954</b>	<b>0</b>	<b>1,692,555</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>75,250,067</b>	<b>137,716,813</b>	<b>149,719,392</b>	<b>73,696,216</b>	<b>85,626,954</b>
<b>Specific Costs of Acquiring Land for Recreation Development</b>															
Frenchman Dam and Lake	3,379	49,950	3,520	49,947	160	0	0	0	0	0	3,379	49,950	3,520	49,947	160
Grizzly Valley Dam and Lake Davis	204,475	554,246	220,423	554,244	17,573	0	0	0	0	0	204,475	554,246	220,423	554,244	17,573
Abbey Bridge Dam and Reservoir	9	9,921	9	9,921	0	0	0	0	0	0	9	9,921	9	9,921	0
Antelope Dam and Lake	3,167	201,137	0	0	0	0	0	0	0	0	3,167	201,137	0	0	0
Oroville Division	7,809,509	5,965,278	11,028,039	649,733	3,673,041	0	55,227	0	0	0	7,809,509	6,020,505	11,028,039	649,733	3,673,041
Del Valle Dam and Lake del Valle	519,425	(32,202)	917,078	(32,200)	448,292	0	0	0	0	0	519,425	(32,202)	917,078	(32,200)	448,292
Sisk Dam, San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	395,284	867,243	425,700	415,610	33,467	0	0	0	0	0	395,284	867,243	425,700	415,610	33,467
California Aqueduct Delta to Dos Amigos Pumping Plant	422,681	(91,879)	603,887	(137,494)	158,456	0	0	0	0	0	422,681	(91,879)	603,887	(137,494)	158,456
California Aqueduct Dos Amigos Pumping Plant to Termini	478,971	419,088	1,271,912	398,349	915,217	0	0	0	0	0	478,971	419,088	1,271,912	398,349	915,217
Castaic Dam and Lake	1,954,297	951,352	5,291,258	951,070	3,856,203	0	0	0	0	0	1,954,297	951,352	5,291,258	951,070	3,856,203
Cedar Springs Dam and Silverwood Lake	424,966	370,164	1,132,207	370,137	817,173	0	0	0	0	0	424,966	370,164	1,132,207	370,137	817,173
Perris Dam and Lake Perris	1,022,313	4,939,976	2,780,487	4,867,247	2,033,799	0	0	0	0	0	1,022,313	4,939,976	2,780,487	4,867,247	2,033,799
<b>Subtotal</b>	<b>13,238,476</b>	<b>14,204,274</b>	<b>23,674,520</b>	<b>8,096,564</b>	<b>11,953,381</b>	<b>0</b>	<b>55,227</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,238,476</b>	<b>14,259,501</b>	<b>23,674,520</b>	<b>8,096,564</b>	<b>11,953,381</b>
<b>Total</b>	<b>88,488,543</b>	<b>150,228,532</b>	<b>173,393,912</b>	<b>81,792,780</b>	<b>97,580,335</b>	<b>0</b>	<b>1,747,782</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>88,488,543</b>	<b>151,976,314</b>	<b>173,393,912</b>	<b>81,792,780</b>	<b>97,580,335</b>

<sup>a</sup> Accrued interest not calculated since October 2001 when SB 1191 amended CWC Section 11912 so that DWR was no longer required to report these costs annually to the Legislature or to submit cost allocations to the California State Parks' Division of Boating and Waterways, California State Parks, and the Department of Fish and Wildlife.



## **Chapter 14**

# **Financial Analysis**

*Clifton Court Forebay.*



## Significant Events in 2012

On March 13, the Department of Water Resources (DWR) delivered \$36.370 million of Water System Revenue Bonds, series AK. The proceeds were presold on February 28 to refinance commercial paper and previously issued bonds, finance long-term construction expenditures, and pay bond financing costs.

On September 5, DWR delivered \$105.875 million of Water System Revenue Bonds, series AL. The proceeds were presold on February 28 to refinance previously sold bonds and to pay bond financing costs.

The proceeds of Water System Revenue Bonds, series AM, were also presold on February 28 to refinance previously sold bonds and to pay bond financing costs. However, DWR will not deliver the \$183.96 million bond until March 5, 2013.

On September 27, DWR delivered \$49.525 million of Water System Revenue Bonds, series AN and \$317.505 million of Water System Revenue Bonds, series AO. The proceeds of series AN were presold on September 19 to refinance commercial paper and previously issued bonds, finance long-term construction expenditures, and pay bond financing costs. The proceeds of series AO were also presold on September 19 to refinance previously sold bonds and to pay bond financing costs.

*Information for this chapter was provided by the State Water Project Analysis Office in conjunction with the Division of Fiscal Services.*

This chapter presents both a summary and a detailed explanation of the State Water Project's (SWP) current financial analysis, capital costs and requirements, revenues and expenses, and bond activities for years 2012 through 2022.

The Department of Water Resources (DWR) performs a financial analysis annually to ensure the SWP financing program will have sufficient funds to meet construction obligations; project operation, maintenance, power, and replacement costs; and debt service payments for bonds expended for construction. The results of the current financial analysis, dated December 31, 2012, are presented in Tables 14-1 and 14-2, located at the end of this chapter. (Please note that, in some instances, the tables in this chapter may not sum due to rounding.)

Future contingencies may change the financial analysis, some of which include:

- alterations in schedules of currently planned construction for future facilities;
- changes in economic conditions, including changes in interest rates and in SWP water contractor Table A amounts due to changes in amounts of water needed, conserved, or reclaimed;
- development of additional sources of water not foreseen at this time;
- deviations from the assumptions regarding actual rates of price escalations for future construction from those currently assumed for cost estimates;
- increases in capital costs related to additional conservation facilities; and
- outcome of lawsuits now pending before the courts.

## Capital Requirements and Financing

In conducting the current financial analysis, DWR projected future construction costs through the year 2022 plus reimbursement of \$103 million interim financing for prior expenditures will total \$1.19 billion. Special capital requirements for revenue bond financing of these construction costs are projected at \$115 million for a total capital requirement of \$1.31 billion. This projection includes construction and financing costs for the following significant SWP projects planned for completion by 2022:

- Perris Dam remediation;
- Phase II enlargement of the East Branch of the California Aqueduct;
- Phase I improvements to the East Branch Extension;
- Phase II of the East Branch Extension;
- enlargement of and improvement to the South Bay Aqueduct (SBA); and
- a new intake to the North Bay Aqueduct.

Most of these capital requirements will be financed from the projected sale of \$1.26 billion of revenue bonds. The remaining \$45 million will be financed from capital resources revenues and the transfer of excess revenues not needed for operation costs or debt service.

The analysis of capital requirements and financing presented in Table 14-1 does not include the costs and financing of all facilities needed to develop the remaining yield necessary to meet the



total 4.2 million acre-foot contractual commitment to long-term SWP water contractors. Table 14-1 also does not include the costs of associated work essential for realizing full benefits from the SWP, but financed and constructed by local interests or State agencies other than DWR. Those facilities include on-shore recreational developments at SWP facilities and local distribution facilities.

The allocation of capital expenditures for various SWP purposes is detailed in Table 14-3.

## Capital Requirements

Lines 1 through 20 in Table 14-1 show actual and projected SWP capital requirements through 2022. Estimates of future capital expenditures include allowances for construction cost escalation of 5 percent per year from 2013 through 2022. Right-of-way costs are escalated at 4 percent per year from 2013 through 2022. Capital expenditures for the SWP also include requirements other than those for construction, such as disbursements made as part of the Davis-Grunsky Act Program (Line 16) and special capital requirements under revenue bond financing (Line 17). DWR will decide whether to construct facilities only after examining alternatives and completing environmental documentation and other review processes.

*Line 1, Initial Project Facilities*, includes only those facilities completed in the initial construction program, which concluded December 31, 1973 (see Bulletin 132-74, Chapter 2). Additional costs after 1973, and estimated costs of remaining work on the initial SWP facilities, are not included.

*Line 2, North Bay Aqueduct*, consists of the estimated costs for improvements and the historical costs for Phase II. Operational in May 1988, Phase II connected with the Phase I facilities, which were completed in 1968 (Phase I costs are included in the initial

project facilities discussed in Line 1). Phase II included costs for pipelines, pumping plants, and a small reservoir necessary to divert water from the western Delta to Napa and Solano counties for urban use. The improvements consist of replacing the existing tank with two 5-million gallon tanks. Construction of the new tanks began in 2007 and was completed in 2010.

*Line 3, Delta and Suisun Marsh Facilities*, shows historical costs that include planning for general Delta facilities and the previously planned peripheral canal and overland water delivery facilities for the western Delta. Also included are historical planning costs for Suisun Marsh as well as construction costs for the Suisun Marsh Salinity Control Gates and an access road. The projected amounts include projected planning costs plus projected costs for fish screens at Sherman and Twitchell islands.

*Line 4, Final Four Units at Banks Pumping Plant*, includes costs of the final four 1,067 cubic feet per second units, which became operational in spring 1992.

*Line 5, Coastal Branch Aqueduct*, includes all costs for the planning, design, and construction of Phase II of the Coastal Branch of the California Aqueduct. Phase II construction began in October 1993 and was completed in 1997. Water deliveries from Phase II facilities began in July 1997.

*Line 6, West Branch Aqueduct*, shows costs for all facilities on the West Branch except Warne Powerplant. Those costs are included in Line 11.

*Line 7, East Branch Enlargement*, includes expenditures for Phases I and II of the East Branch Enlargement. Phase I included the enlargement share of power plant costs at Mojave Siphon and Devil Canyon. (The remaining power plant costs are included in Line 11.) East Branch Enlargement costs for Phase I, by facility, are presented in

**Table 14-3 Allocation of Capital Expenditures (in thousands of dollars)**

Facilities and Construction Divisions	Expenditures Incurred Through 2012	Future Expenditures	Total	Preliminary Allocation Among Project Purposes			
				Water Supply and Power Generation	Flood Control <sup>a</sup>	Recreation and Fish and Wildlife Enhancement	Other <sup>b</sup>
<b>Project Construction Expenditures</b>							
Upper Feather Division	19,926	–	19,926	1,558	0	18,368	0
Oroville Division (excludes Small Hydro)	650,913	83,239	734,152	636,702	71,690	25,761	0
Delta Facilities Division	429,820	55,281	485,101	468,136	0	16,965	0
North Bay Aqueduct	109,170	407,875	517,045	517,045	0	0	0
South Bay Aqueduct	374,593	4,987	379,580	356,025	8,239	15,315	0
California Aqueduct							
North San Joaquin Division	277,850	30,072	307,922	297,226	0	10,696	0
San Luis Division	283,515	7,542	291,057	277,702	0	13,354	0
South San Joaquin Division	330,031	6,720	336,751	318,968	0	17,783	0
Tehachapi Division	374,378	3,471	377,849	356,917	0	20,932	0
Mojave Division (excludes Small Hydro)	359,761	7,700	367,461	327,148	0	40,313	0
Santa Ana Division	297,969	152,746	450,715	407,761	0	42,954	0
West Branch	558,763	4,252	563,015	530,417	0	32,598	0
Coastal Branch	492,509	6,134	498,643	498,643	0	0	0
<i>Subtotal, California Aqueduct</i>	<i>2,974,775</i>	<i>218,638</i>	<i>3,193,413</i>	<i>3,014,783</i>	<i>0</i>	<i>178,630</i>	<i>0</i>
Other Project Facilities							
Small Hydroelectric Power							
Generating Facilities	99,798	0	99,798	99,798	0	0	0
Off-Aqueduct Power							
Generating Facilities	491,573	0	491,573	491,573	0	0	0
East Branch Enlargement	461,807	318	462,125	462,125	0	0	0
East Branch Extension	191,225	178,746	369,971	369,971	0	0	0
Coastal Power Allocation	30,708	0	30,708	30,708	0	0	0
Agricultural Drainage Facilities	81,852	17,200	99,052	0	0	0	99,052
Planning and Pre-operations	67,106	31,700	98,806	98,806	0	0	0
Unassigned/Miscellaneous	56,051	90,200	146,251	0	0	0	146,251
<i>Subtotal, Project Construction Expenditures</i>	<i>6,039,318</i>	<i>1,088,185</i>	<i>7,127,502</i>	<i>6,547,231</i>	<i>79,929</i>	<i>255,040</i>	<i>245,303</i>
<b>Other Capital Requirements</b>							
Davis-Grunsky Act Program	130,000	0	130,000	0	0	0	130,000
<b>Total Capital Expenditures</b>	<b>6,169,318</b>	<b>1,088,185</b>	<b>7,257,502</b>	<b>6,547,231</b>	<b>79,929</b>	<b>255,040</b>	<b>375,303</b>

<sup>a</sup> Reflects DWR's allocation to this purpose, irrespective of federal payments.

<sup>b</sup> Includes costs currently unassigned to purpose, planning costs of deleted features of project facilities, initial costs of inventoried items, and costs assigned to the Davis-Grunsky Act Program.

Table 14-4. Costs for Alamo Powerplant consist of expenditures for Unit 1 facilities allocated to enlargement. Construction of Unit 2 was deferred.

Work on the environmental impact report, mapping, and preliminary design for Phase II of the enlargement began in March 2007. Construction is projected to be completed in 2021. Project costs include raising the canal embankment and concrete lining, constructing additional siphon barrels, adding bays to check structures, constructing Unit 2 at Alamo Powerplant, and adding two pump/motor units and a discharge line at Pearblossom Pumping Plant.

All costs in Line 7 are allocated to and repaid by the seven Southern California contractors participating in the East Branch Enlargement.

*Line 8, East Branch Improvements*, shows all aqueduct costs on the East Branch not allocated to the enlargement project. Those costs include improvements constructed concurrently with the enlargement work, the reconstruction of the San Bernardino Tunnel Intake, and the construction of the Tehachapi East Afterbay. Costs for power plant construction at Alamo, Mojave Siphon, and Devil Canyon are not included in this line.

*Line 9, East Branch Extension*, shows expenditures for Phases I and II of the extension of the East Branch of the California Aqueduct. The East Branch Extension extends the California Aqueduct east from the Devil Canyon Powerplant to a terminus at Noble Creek near Beaumont in Riverside County. The extension provides water service to the San Geronio Pass Water Agency and the San Bernardino Valley Municipal Water District. Construction of Phase I began in February 1999 and was completed in 2003. Phase I improvements include enlargement of the Crafton Hills Reservoir and construction of the Yucaipa Connector Pipeline. Construction of this phase is to be completed in 2013. Phase II will increase

the pumping capacity to 100 percent of design capacity. Construction of Phase II began in 2012. All costs in Line 9 will be allocated to and repaid by the two participating contractors.

*Line 10, South Bay Aqueduct Improvements and Enlargement*, shows expenditures for providing additional capacity required to meet increases in water demands for the service area of Alameda County Flood Control and Water Conservation District, Zone 7, and increasing the existing capacity of the SBA to its original design capacity. Construction began in 2006 and is scheduled to be completed in 2013.

*Line 11, Power Generation and Transmission Facilities*, does not include the East Branch Enlargement share of costs for Alamo, Mojave Siphon, and Devil Canyon powerplants shown in Line 7 of Table 14-1. The capital costs for facilities included in Line 11 are shown in Table 14-5.

*Line 12, Additional Conservation Facilities*, shows projected costs to plan and study additional conservation facilities. Specific planning activities and projected spending amounts for 2013 through 2022 are shown in Table 14-6. Expenditures for these items are being reviewed. Construction costs of additional conservation facilities are not included in the financial analysis.

Line 12 does not include the Bay Delta Conservation Plan costs. DWR's share of the Bay Delta Conservation Plan expenditures for preliminary planning and environmental impact report preparation are currently financed by participating contractors.

*Line 13, Agricultural Drainage Facilities*, includes projected costs of the Agricultural Drainage Program. The activities in this program are monitoring, evaluating, reducing, and treating drainage, as well as investigating treatment and reuse of drainage water.

**Table 14-4 East Branch Enlargement Capital Costs by Facility**

Facility	Amount (in millions of dollars)
Aqueduct and Siphons	128.1
Pearblossom Pumping Plant	70.1
Alamo Powerplant	5.0
Mojave Siphon Powerplant	47.3
Devil Canyon Powerplant and Second Afterbay	202.9
<b>Total</b>	<b>453.4</b>

**Table 14-5 Estimated Capital Costs for Power Generation and Transmission Facilities**

Power Plants and Transmission Lines	Amount (in millions of dollars)
<b>Power Plants</b>	
Reid Gardner, Unit 4	311.3
Bottle Rock	120.9
South Geysers	49.6
Devil Canyon	36.8
Warne	84.5
Alamo	44.9
Mojave Siphon	40.8
Thermalito Diversion Dam	14.1
<i>Subtotal</i>	<i>702.9</i>
<b>Transmission Lines</b>	
Midway–Wheeler Ridge	10.7
Geysers–Lakeville	6.9
<i>Subtotal</i>	<i>17.6</i>
<b>Total</b>	<b>720.5</b>

**Table 14-6 Estimated Future Costs for Planning Additional Conservation Facilities**

Activity	Amount (in millions of dollars)
SWP Future Water Supply	31.7
Other Planning Costs	0.0
<b>Total</b>	<b>31.7</b>

DWR assumes that future costs of the drainage program will be financed by revenue transfers (Line 36).

*Line 14, Other Costs*, includes items such as general design and construction costs, costs of completing operation and maintenance facilities, and costs of other completion activities for the initial facilities of the California Aqueduct. Portions of those costs ultimately will be allocated to California Aqueduct units described in the preceding paragraphs.

*Line 15, Subtotal Project Construction Expenditures*, is the total of Lines 1 through 14.

*Line 16, Davis-Grunsky Act Program Costs*, shows costs of the Davis-Grunsky Act Program, a financial assistance program to provide grants and loans to public agencies for constructing local water projects.

As of December 31, 2012, DWR had disbursed \$130 million (including \$8.5 million for administration) in grants and loans to local agencies throughout the State.

*Line 17, Special Capital Requirements Under Revenue Bond Financing*, presents special capital requirements at the time revenue bonds are sold. The financial analysis assumes that proceeds from any future revenue bonds will be used to pay for bond discounts, bond issuance costs, and debt service reserve requirements.

Information about the application of proceeds to these special requirements for actual and assumed revenue bond sales is presented in Table 14-7.

*Line 18, Total Capital Requirements*, is the total of Lines 15, 16, and 17.

*Line 19, Power Facilities Capital Requirements*, shows the total capital requirements for power facilities included in Line 18.

*Line 20, Water Facilities Capital Requirements*, shows the total capital requirements for water facilities included in Line 18.

## Capital Financing

The SWP was constructed using three general types of financing: Burns-Porter Act, revenue bonds, and capital resources. Lines 21 through 37 of Table 14-1 present specific information about these financing sources.

### Burns-Porter Act

Burns-Porter Act financing is derived from the sale of California Water Resources Development Bonds (general obligation bonds) and State tideland oil revenues deposited in the California Water Fund as authorized by the Burns-Porter Act (California Water Code Sections 12930–12944), approved by voters in November 1960. The Burns-Porter Act authorized an issuance of \$1.75 billion of general obligation State bonds, which are repaid by revenues received according to the water supply contracts. Of that authorization, \$130 million was reserved specifically for the Davis-Grunsky Act Program.

Proceeds from the sale of general obligation bonds were deposited in the California Water Resources Development Bond Fund—Bond Proceeds Account, from which monies were expended only for the construction of SWP facilities and for the Davis-Grunsky Act Program. Approximately 26 percent of the expenditures through 2012 for construction and the Davis-Grunsky Act Program were financed with general obligation bonds.

Monies deposited in the California Water Fund were appropriated for purposes outlined in the Burns-Porter Act. Such deposits were derived from a portion of the



**Table 14-7 Application of Revenue Bond Proceeds (in millions of dollars)**

Bond Series <sup>a</sup>	Construction Expenditures	Other Capital Requirements				Subtotal	Total Principal Amount of Bonds
		Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Financing and Refunding Costs <sup>b</sup>		
Oroville	218.0	2.6	19.9	1.5	3.0	27.0	245.0
Devil Canyon-Castaic	126.4	0.0	10.0	0.7	2.1	12.8	139.2
Pyramid Series A	74.0	0.0	19.2	1.0	1.6	21.8	95.8
Reid Gardner Series B	146.1	0.0	41.9	0.0	12.0	53.9	200.0
Reid Gardner Series C	91.1	0.0	17.9	7.9	8.1	33.9	125.0
Small Hydro-South Geysers Series D	49.6	0.0	19.9	0.0	5.5	25.4	75.0
Bottle Rock Series E	96.9	0.0	22.0	3.7	2.4	28.1	125.0
Alamo-South Geysers Series F	59.1	0.0	14.2	0.0	1.7	15.9	75.0
Reid Gardner Series G	1.6	0.0	0.0	0.0	237.9	237.9	239.5
Power Facilities Series H	22.2	0.0	0.0	0.0	184.5	184.5	206.7
East Branch Enlargement Series A	108.3	0.0	12.6	0.0	11.1	23.7	132.0
Water System Facilities Series B	97.4	0.0	0.0	0.0	2.6	2.6	100.0
Water System Facilities Series C	0.6	0.0	0.0	0.0	8.4	8.4	9.0
Water System Facilities Series D	95.9	0.0	2.9	0.0	1.2	4.1	100.0
Water System Facilities Series E	0.4	0.0	0.0	0.0	8.6	8.6	9.0
Water System Facilities Series F	0.0	0.0	0.0	0.0	160.0	160.0	160.0
Water System Facilities Series G	86.8	0.0	4.6	0.0	8.6	13.2	100.0
Water System Facilities Series H	85.5	0.0	5.7	0.0	8.8	14.5	100.0
Water System Facilities Series I	158.9	0.0	5.8	0.0	15.3	21.1	180.0
Water System Facilities Series J	0.0	0.0	0.0	0.0	649.8	649.8	649.8
Water System Facilities Series K	88.6	0.0	3.1	0.0	8.3	11.4	100.0
Water System Facilities Series L	0.0	0.0	0.0	0.0	537.8	537.8	537.8
Water System Facilities Series M	166.3	0.0	9.9	0.0	13.8	23.7	190.0
Water System Facilities Series N	137.4	0.0	6.0	0.0	8.6	14.6	152.0
Water System Facilities Series O	156.5	0.0	8.4	0.0	170.1	178.5	335.0
Water System Facilities Series P	141.6	0.0	5.2	0.0	13.2	18.4	160.0
Water System Facilities Series Q	135.0	0.0	8.0	0.0	123.6	131.6	266.6
Water System Facilities Series R	0.0	0.0	0.0	0.0	20.7	20.7	20.7
Water System Facilities Series S	78.2	0.0	5.8	0.0	116.2	122.0	200.2
Water System Facilities Series T	0.0	0.0	0.0	0.0	135.7	135.7	135.7
Water System Facilities Series U	98.7	0.0	5.3	0.0	103.2	108.5	207.2
Water System Facilities Series V	0.0	0.0	0.0	0.0	20.6	20.6	20.6
Water System Facilities Series W	41.0	0.0	1.3	0.0	218.7	220.0	261.0
Water System Facilities Series X	0.0	0.0	0.0	0.0	160.2	160.2	160.2
Water System Facilities Series Y	0.0	0.0	0.0	0.0	329.9	329.9	329.9
Water System Facilities Series Z	0.0	0.0	0.0	0.0	170.7	170.7	170.7
Water System Facilities Series AA	0.0	0.0	0.0	0.0	108.7	108.7	108.7
Water System Facilities Series AB	92.2	0.0	3.9	0.0	93.6	97.5	189.7
Water System Facilities Series AC	13.7	0.0	0.6	0.0	257.7	258.3	272.0
Water System Facilities Series AD	12.4	0.0	0.9	0.0	99.1	100.0	112.4
Water System Facilities Series AE	383.9	0.0	9.5	0.0	239.5	249.0	632.9
Water System Facilities Series AF	33.4	0.0	1.3	0.0	253.1	254.4	287.7
Water System Facilities Series AG	9.9	0.0	0.4	0.0	158.8	159.2	169.1
Water System Facilities Series AH	71.7	0.0	3.6	0.0	22.3	26.0	97.7
Water System Facilities Series AI	0.0	0.0	0.0	0.0	92.3	92.3	92.3

**Table 14-7 Application of Revenue Bond Proceeds (in millions of dollars)** *(continued)*

Bond Series <sup>a</sup>	Construction Expenditures	Other Capital Requirements				Subtotal	Total Principal Amount of Bonds
		Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Financing and Refunding Costs <sup>b</sup>		
Water System Facilities Series AJ	69.3	0.0	3.7	0.0	143.9	147.6	216.9
Water System Facilities Series AK	32.0	0.0	0.9	0.0	3.4	4.3	36.4
Water System Facilities Series AL	0.0	0.0	0.0	0.0	105.9	105.9	105.9
Water System Facilities Series AN	44.8	0.0	0.3	0.0	4.4	4.7	49.5
Water System Facilities Series AO	0.0	0.0	0.0	0.0	317.5	317.5	317.5
<i>Subtotal</i>	3,325.5	2.6	274.8	14.8	5,384.7	5,676.9	9,002.3 <sup>c</sup>
Future East Branch Enlargement Bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Future East Branch Extension Bonds	178.8	0.0	8.1	0.0	10.2	18.3	197.1
Future SBA Enlargement Bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Future Water System Facilities Bonds	967.7	0.0	42.8	0.0	54.4	97.2	1,064.9
<b>Total</b>	<b>4,471.9</b>	<b>2.6</b>	<b>325.6</b>	<b>14.8</b>	<b>5,449.3</b>	<b>5,792.3</b>	<b>10,264.3</b>

<sup>a</sup> Actual bond issue for all except future East Branch Enlargement, future East Branch Extension, future South Bay Aqueduct Improvements and Enlargement, and future Water System Facilities bonds.  
<sup>b</sup> Bond financing and refunding costs include funds applied to debt service reserve requirements.  
<sup>c</sup> Includes \$5,009.6 million of refunded principal, leaving a net principal obligation of \$3,992.7 million.

State tideland oil revenues, in accordance with a continuing authorization. The California Water Fund was used to finance \$508 million, or approximately 8 percent, of the construction expenditures through 2012.

**Revenue Bonds**

Revenue bond financing is derived from the sale of revenue bonds as authorized by the Central Valley Project Act (California Water Code Sections 11100–11925). DWR’s authority to issue revenue bonds was confirmed by a decision of the California Supreme Court in 1963 (*Warne v. Harkness*, 60 Cal. 2d 579).

Proceeds from the sale of revenue bonds are deposited in the Central Valley Water Project Construction Fund, from which money is expended only for purposes specified in the resolution authorizing each bond sale. Those purposes, in addition to paying construction, planning, and right-of-way costs, may include funding the Debt Service Reserve Account, paying interest on bonds, and paying water system operating expenses during a specified period.

As of December 31, 2012, DWR had sold \$9.0 billion of revenue bonds. That amount includes \$5.0 billion of refunded bonds, leaving a total principal obligation of \$4.0 billion.

**Capital Resources**

Capital resources financing is derived from payments and appropriations (including a portion of the State tideland oil revenues) authorized by a variety of special contracts, cost-sharing agreements, and legislative actions concerning the SWP, plus accrued interest on these funds. Capital resources revenues are deposited in the Central Valley Water Project Construction Fund and may be expended for interest on general obligation bonds and costs of constructing SWP facilities.

According to DWR’s financial management policy, the capital resources revenues are used first to cover any general obligation bond debt service that exceeds available revenues.

## Capital Financing Sources

Capital financing sources include power revenue bonds, East Branch Enlargement bonds, East Branch Extension bonds, SBA Enlargement bonds, water system facilities bonds, initial project facilities bonds, bond proceeds from the Davis-Grunsky Act Program, California Water Fund monies, and capital resources revenues.

*Line 21, Power Facilities Revenue Bonds through Series H*, includes the proceeds applied from power revenue bonds for Oroville, Devil Canyon, Castaic, Warne, Reid Gardner, Bottle Rock, Alamo, South Geysers, and small hydro projects.

No future power revenue bond sales are projected for this financial analysis.

*Line 22, East Branch Enlargement, Current Bonds*, shows that \$474 million of Water System Revenue Bond proceeds has been applied to the East Branch Enlargement project through December 31, 2012. Of this total, \$417 million was used for construction expenditures and \$57 million was used for bond discounts, interest costs, and debt service reserve requirements.

*Line 23, East Branch Enlargement, Future Bonds*, shows DWR's estimate of bonds required to complete construction of the East Branch Enlargement Phase II.

*Line 24, East Branch Extension, Current Bonds*, shows that \$204 million of Water System Revenue Bond proceeds has been spent through December 31, 2012.

*Line 25, East Branch Extension, Future Bonds*, shows DWR's estimate of \$197 million of additional bonds required to complete construction of the East Branch Extension and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

*Line 26, South Bay Aqueduct Enlargement, Current Bonds*, shows that \$195 million of Water System Revenue Bond proceeds had been spent through December 31, 2012.

*Line 27, South Bay Aqueduct Enlargement, Future Bonds*, shows DWR's estimate of bonds required to complete construction of the SBA Enlargement and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

*Line 28, Water System Facilities, Current Bonds*, shows that through December 31, 2012, \$1.9 billion of proceeds from Water System Revenue Bonds, Series A through Series AO, was applied to SWP projects other than the East Branch Enlargement, the East Branch Extension, and the SBA Enlargement. Of this total, \$1.7 billion was used to pay for construction expenditures and \$0.2 billion was used to pay for bond discounts, capitalized interest, and debt service reserve requirements.

*Line 29, Water System Facilities, Future Bonds*, shows that \$1.1 billion of future water revenue bonds is needed to provide \$968 million for construction of SWP water system facilities and \$97 million for bond discounts, interest costs, and debt service reserve requirements.

*Line 30, Subtotal, Water System Revenue Bonds*, is the total of Lines 22 through 29.

*Line 31, Initial Project Facilities Bond Proceeds*, shows the amount of general obligation bonds sold to provide financing costs for initial SWP facilities and for costs of planning certain additional conservation facilities.

Financing initial facilities from general obligation bonds was completed in mid-1972 and totaled \$1.444 billion—\$1.750 billion Burns-Porter Act authorization less \$130 million reserved for the Davis-Grunsky Act Program and \$176 million "offset" for additional conservation facilities. (The

Burns-Porter Act provides that to the extent California Water Fund monies are expended, an equal amount of general obligation bonds are reserved [offset] for financing the construction of additional conservation facilities in certain watersheds.)

In mid-1972, the reservation of offset bonds was effectively limited to \$176 million, the total amount of California Water Fund monies expended up to that time. By mid-1972, all general obligation bonds authorized by the Burns-Porter Act had been offset, reserved for the Davis-Grunsky Act Program, or used for SWP construction.

Approximately \$8.5 million of the offset bonds was used to finance planning studies of the Middle Fork Eel River Development. This financial analysis is not based on the use of any offset bond proceeds to meet capital requirements. If, at some time, the State constructs an additional conservation facility, as specified in California Water Code Section 12938, the remaining offset bonds could be sold.

*Line 32, Davis-Grunsky Act Program Bond Proceeds*, shows, for simplification, the entire \$130 million of capital expenditures authorized for the Davis-Grunsky Act Program, according to the Burns-Porter Act, as being funded by proceeds from the sale of general obligation bonds. In fact, \$102 million originated from bond proceeds while \$28 million from the California Water Fund was used for the program in lieu of bond proceeds prior to 1969. Since the final offset in 1994, DWR has accumulated \$44.6 million in capital costs through fiscal year 2006–2007.

*Line 33, Application of California Water Fund Monies*, shows the amount of SWP costs financed under the Burns-Porter Act. The act provides that any available money in the California Water Fund must be used for construction in lieu of proceeds from the sale of general obligation bonds.

When the Burns-Porter Act became effective in late 1960, approximately \$97 million had been accumulated in the fund. That balance, plus subsequent appropriations, interest earnings, and other miscellaneous income to the fund through December 31, 2012, was used to finance a total of \$508 million of SWP costs.

*Line 34, Interim Financing*, shows the net annual amounts of funds flowing into and out of the Water Revenue Commercial Paper Notes program. This program was established in March 1993 to provide an ongoing source of interim financing for water system projects prior to permanent financing from the sale of long-term revenue bonds. DWR has authority to issue up to \$150.0 million of Water Revenue Commercial Paper Notes. A positive number indicates money borrowed from the program to finance construction costs. A negative number indicates money repaid to the program. The financial analysis assumes that all funds borrowed from the program will be repaid before the end of the analysis period.

*Line 35, Application of Capital Resources Revenues to Construction*, presents the Capital Resources Revenues applied for capital expenditures.

*Line 36, Revenue Transfers Applied*, shows monies assumed to be transferred to the California Water Fund, according to provisions of the Burns-Porter Act, and subsequently reappropriated to construction (see Line 40 of Table 14-2). Projected amounts for the years 2013 through 2022 include funds to finance expenditures for agricultural drainage facilities, as indicated in Line 13 of Table 14-1, and expenditures for additional conservation facilities, as indicated in Line 12.

*Line 37, Subtotal, Other Capital Financing*, is the total of Lines 31 through 36.

*Line 38, Total Financing of Capital Requirements*, totals Lines 21, 30, and 37.



## Annual Revenues and Expenditures

After financial analysis of SWP operations, DWR concluded that projected payments by contractors and other revenues will be adequate to pay annual operations, maintenance, power, and replacement costs and meet all repayment obligations on funds used to finance SWP construction and other authorized costs during the period 2013 through 2022. Data on annual revenues and expenditures are presented in Table 14-2. A detailed discussion of each line item follows.

### Project Revenues

Project revenues primarily consist of SWP water contractor payments required under their individual long-term water supply contracts. Those revenues are deposited in two funds: the Central Valley Water Project Revenue Fund, where all revenues pledged to revenue bonds are placed, and the California Water Resources Development Bond Fund—Systems Revenue Account, where all other SWP operating revenues are placed. Use of those funds is limited to paying operating costs and debt service; except that revenues in excess of those costs may be deposited to a reserve for future SWP construction, since the California Water Fund has been repaid (see Line 39).

*Line 1, Capital Resources Revenues*, includes the following:

- federal payments for SWP capital expenditures;
- appropriations for capital costs allocated to recreation;
- appropriations for SWP capital expenditures prior to passage of the Burns-Porter Act and according to Senate Bill 261 (1968);
- payments from Los Angeles Department of Water and Power for Castaic power development;

- advances from contractors for construction of requested work;
- investment earnings on the Capital Resources Account; and
- investment earnings on unexpended revenue bond proceeds.

Historically, appropriations for capital costs allocated to recreation and fish and wildlife enhancement have amounted to \$5 million per year and have been appropriated by the California Legislature from the State tideland oil revenues. There have been no appropriations from this fund since 1985.

Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to recreation and fish and wildlife enhancement against the amount the SWP owed to the California Water Fund (see Line 39). Since the final offset in 1994, DWR has accumulated \$67.2 million in capital costs through fiscal year 2011–2012.

In 2012, the Davis-Dolwig Act was amended to appropriate \$10 million per fiscal year from the Harbors and Watercraft Revolving Fund to cover the OMP&R and capital costs allocated to recreation and fish and wildlife enhancement. Starting in fiscal year 2012–2013, \$7.5 million is being appropriated for on-going OMP&R and capital costs and \$2.5 million is being appropriated to reimburse for past unreimbursed OMP&R and capital costs.

*Lines 2 through 12, Water Contractor Payments*, show amounts of the separate elements of water contractor payments.

Amounts in Line 4 also include revenues sufficient to cover costs associated with sales of excess power. Appendix B of this bulletin presents a detailed explanation of payments identified in Lines 2 through 12.

Operations, maintenance, power, and replacement (OMP&R) costs are repaid



**Table 14-8 Revenue Bond Proceeds Affecting Project Interest Rate (in millions of dollars)**

Project	Proceeds Included in Project Interest Rate				Total Principal Amount of Bonds	Percentage of Total Amount Included in Calculating Project Interest Rate [4] / [5]
	Applied to Construction Costs	Less Portion of Proceeds Derived from Interest Earnings Prior to Delivery of Bonds	Plus Bond Financing and Refunding Costs	Subtotal, Proceeds Included in Calculating Project Interest Rate [1] - [2] + [3]		
	[1]	[2]	[3]	[4]		
Devil Canyon-Castaic Project Revenue Bonds	125.3	1.5	1.4	125.2	139.2	90
Pyramid Project Revenue Bonds (Series A)	71.2	0.5	1.1	71.8	95.8	75
Alamo Project Bond Anticipation Note	16.8	0.1	0.3	17.0	24.4	70
Small Hydro Project I Revenue Bonds (Series D)	25.4	0.2	1.5	26.7	37.5	71
Alamo Project Revenue Bonds (Series F)	38.9	0.3	0.7	39.3	50.0	79
Power Facilities Revenue Bonds (Series H)						
Pyramid Project	5.0	0.0	0.1	5.1	5.1	100
Alamo Project	1.7	0.0	0.0	1.7	1.7	100
Small Hydro Project I	25.2 <sup>a</sup>	0.2	0.4	25.4	35.6	71
Water System Revenue Bonds (Series J)						
Pyramid Project	0.0	0.0	75.9 <sup>b</sup>	75.9	99.2 <sup>b</sup>	77
Alamo Project	0.0	0.0	45.6 <sup>b</sup>	45.6	57.1 <sup>b</sup>	80
Small Hydro Project I	0.0	0.0	27.8 <sup>b</sup>	27.8	38.8 <sup>b</sup>	72
Water System Revenue Bonds (Series L)						
Small Hydro Project I	0.0	0.0	1.5 <sup>b</sup>	1.5	2.1 <sup>b</sup>	71
Water System Revenue Bonds (Series Q)						
Pyramid Project	0.0	0.0	3.0 <sup>b</sup>	3.0	3.9 <sup>b</sup>	77
Alamo Project	0.0	0.0	4.8 <sup>b</sup>	4.8	6.0 <sup>b</sup>	80
Water System Revenue Bonds (Series S)						
Pyramid Project	0.0	0.0	8.0 <sup>b</sup>	8.0	10.4 <sup>b</sup>	77
Alamo Project	0.0	0.0	7.6 <sup>b</sup>	7.6	9.5 <sup>b</sup>	80
Water System Revenue Bonds (Series U)						
Pyramid Project	0.0	0.0	2.4 <sup>b</sup>	2.4	3.2 <sup>b</sup>	75
Alamo Project	0.0	0.0	3.2 <sup>b</sup>	3.2	4.0 <sup>b</sup>	80
Water System Revenue Bonds (Series W)						
Pyramid Project	0.0	0.0	27.7 <sup>b</sup>	27.7	36.0 <sup>b</sup>	77
Alamo Project	0.0	0.0	11.8 <sup>b</sup>	11.8	14.7 <sup>b</sup>	80
Small Hydro Project (construction)	3.4	0.0	0.0	3.4	3.7	92
Small Hydro Project (refunding)	0.0	0.0	16.3 <sup>b</sup>	16.3	22.7 <sup>b</sup>	72
Water System Revenue Bonds (Series X)						
Pyramid Project	0.0	0.0	8.5 <sup>b</sup>	8.5	11.0 <sup>b</sup>	77
Alamo Project (Series H refunding)	0.0	0.0	0.3 <sup>b</sup>	0.3	0.3 <sup>b</sup>	100
Alamo Project (Series F refunding)	0.0	0.0	3.9 <sup>b</sup>	3.9	4.9 <sup>b</sup>	79
Small Hydro Project	0.0	0.0	4.6 <sup>b</sup>	4.6	6.4 <sup>b</sup>	72

<sup>a</sup> Amount consists of 71 percent of proceeds deposited in escrow to refund portion of Series D bonds (\$35.1 million plus deposits to construction account [\$0.3 million]).

<sup>b</sup> Represents amount of principal used to refund portions of prior bond issuances.

as they are incurred as part of the Transportation Charge; therefore, no interest charges are included. Construction costs included in the Transportation Charge, and all construction and annual OMP&R costs included in the Delta Water Charge, are to be repaid with interest at the Project Interest Rate.

The Project Interest Rate, as defined in Article 1(r) of the standard provisions of the long-term water supply contracts, is the weighted average of the rates paid on certain securities issued and loans obtained to finance SWP facilities.

According to the original water supply contract provisions, the basis for determining the Project Interest Rate was the weighted average of rates paid on general obligation bond sales only. In 1969, after Oroville Revenue Bonds were issued, the contracts were amended to expand the basis to include rates on all other securities sold and loans obtained thereafter for financing SWP facilities, including revenue bonds (see Bulletin 132-70, page 28).

However, not all proceeds from the sale of revenue bonds are melded into the calculation of the Project Interest Rate. Only those proceeds applied to construction costs (the only application of general obligation bonds permitted by law) and those consumed by the bond discount (a component of the total interest cost of a revenue bond issue) are included in the calculation (see Table 14-8).

Calculations for determining the Project Interest Rate do not include proceeds from the sale of revenue bonds for Off-Aqueduct Power facilities, the East Branch Enlargement facilities, SBA, or water system facilities defined in the Water Revenue Bond Amendment. Table 14-9 lists all bond sales by date and presents basic information used in the calculation of the Project Interest Rate.

Information about contractor water charges in Appendix B, which can be found in the back of this bulletin, is based on known conditions and substantiates DWR's determination of 2014 water charges to be billed on July 1, 2013. However, information about significant differences between the sum of future charges included in Lines 2 through 12 of Table 14-2 and the substantiation of 2013 charges included in Appendix B are as follows.

- Future capital costs in Appendix B are based on the prevailing prices as of December 31, 2012. Those costs presented in the financial analysis include allowances for price escalation.
- Pre-2013 charges in Appendix B represent charges as they should have been, according to currently known conditions. Pre-2013 charges included in Table 14-2 are those actually paid as part of previously determined bills.
- Charges in Appendix B are unadjusted for past overpayments or underpayments. Charges included in Table 14-2 for 2013 and thereafter have been adjusted for any apparent overpayments or underpayments of pre-2013 charges.
- Charges in Appendix B for East Branch Enlargement costs include the amounts for debt service and 25 percent cover for the East Branch Enlargement share of the Series A through Series AO bonds. Charges in Table 14-2 apply to Series A through Series AO bonds and also include amounts of the debt service and cover for assumed future bonds.
- The water revenue bond surcharge in Appendix B applies only to the Series B through Series AO bonds. Surcharge values included in Table 14-2 apply to Series B through Series AO bonds and to assumed future issues required to finance SWP construction costs included in Table 14-1.

**Table 14-9 Actual Bond Sales and Project Interest Rates, by Date of Sale**

Bond Sales	Date of Sale	Delivery Date	Dollar-Years <sup>a</sup> (thousands)	Interest Cost (thousands)	Issue Interest Rate <sup>b</sup> (percent)	Project Interest Rate <sup>c</sup> (percent)
\$ 50,000,000 Bond Anticipation Notes	11/21/63	11/21/63	26,944	531	1.971	1.971
\$100,000,000 Series A Water Bonds	2/18/64	2/18/64	3,402,000	119,750	3.520	3.508
\$ 50,000,000 Series B Water Bonds	5/05/64	5/05/64	1,726,000	60,986	3.533	3.516
\$100,000,000 Series C Water Bonds	10/07/64	10/07/64	3,452,000	123,764	3.585	3.544
\$100,000,000 Series D Water Bonds	2/16/65	2/16/65	3,497,900	122,403	3.499	3.531
\$100,000,000 Series E Water Bonds	11/23/65	11/23/65	3,497,900	130,029	3.717	3.573
\$100,000,000 Series F Water Bonds	6/08/66	6/08/66	3,497,900	137,359	3.927	3.638
\$100,000,000 Series G Water Bonds	11/22/66	11/22/66	3,497,900	143,788	4.111	3.711
\$100,000,000 Series H Water Bonds	3/21/67	3/21/67	3,497,900	129,261	3.695	3.709
\$100,000,000 Series J Water Bonds	7/18/67	7/18/67	3,497,900	143,199	4.094	3.754
\$100,000,000 Series K Water Bonds	11/14/67	11/14/67	3,497,900	163,887	4.685	3.853
\$150,000,000 Revenue Bonds, Oroville Division, Series A	4/03/68	4/03/68	5,228,700	270,289	5.169	
\$100,000,000 Series L Water Bonds	7/11/68	7/11/68	3,497,900	166,918	4.772	3.941
\$100,000,000 Series M Water Bonds	10/22/68	10/22/68	3,497,900	169,989	4.860	4.021
\$ 94,995,000 Revenue Bonds, Oroville Division, Series B	4/01/69	4/01/69	3,423,460	195,902	5.722	
\$ 46,761,000 Cumulative 1970 General Fund Borrowing, repaid 7/10/70	-		4,938	346	7.007	
\$200,000,000 Series N and P Bond Anticipation Notes	6/16/70	6/16/70	200,000	11,660	5.830	4.030
\$100,000,000 Series N Water Bonds	2/02/71	2/02/71	3,447,900	190,292	5.519	4.148
\$100,000,000 Series Q Bond Anticipation Notes	3/10/71	3/10/71	100,000	2,349	2.349	4.143
\$100,000,000 Series P Water Bonds	4/21/71	4/21/71	3,397,900	193,377	5.691	4.255
\$150,000,000 Series Q and R Water Bonds	11/09/71	11/09/71	5,171,850	265,734	5.138	4.342
\$ 40,000,000 Series S Water Bonds	3/28/72	3/28/72	1,399,160	76,509	5.468	4.371
\$139,165,000 Devil Canyon-Castaic Revenue Bonds	8/08/72	8/08/72	4,776,204	258,839	5.419	4.457
\$ 10,000,000 Series T Water Bonds	3/20/73	3/20/73	185,265	9,491	5.123	4.459
\$ 10,000,000 Series U Water Bonds	1/13/76	1/13/76	158,750	8,731	5.500	4.462
\$ 10,000,000 Series V Water Bonds	11/15/77	11/15/77	158,750	7,573	4.770	4.462
\$ 95,800,000 Pyramid Hydroelectric Revenue Bonds	10/23/79	10/23/79	2,260,072	172,495	7.632	4.584
\$150,000,000 Reid Gardner Project, Series A Bond Anticipation Notes	7/1/81	7/1/81	347,906	29,572	8.500	
\$ 75,600,000 Bottle Rock Project, Bond Anticipation Notes	12/1/81	12/1/81	264,600	25,137	9.500	
\$ 24,400,000 Alamo Project, Bond Anticipation Notes	12/1/81	12/1/81	24,266	2,305	9.499	4.589
\$200,000,000 Reid Gardner Project, Series B Revenue Bonds	7/07/82	7/07/82	4,623,137	553,793	11.979	
\$125,000,000 Reid Gardner Project, Series C Revenue Bonds	11/16/82	11/16/82	2,720,045	255,744	9.402	
\$ 37,500,000 Small Hydro Project I, Series D Revenue Bonds	11/16/82	11/16/82	837,769	84,587	10.097	4.666
\$ 37,500,000 South Geysers Project, Series D Revenue Bonds	11/16/82	11/16/82	930,325	90,021	9.676	
\$125,000,000 Bottle Rock Project, Series E Revenue Bonds	4/27/83	4/27/83	2,624,805	225,102	8.576	
\$ 50,000,000 Alamo Project, Series F Revenue Bonds	4/27/83	4/27/83	1,190,763	100,836	8.468	4.727
\$ 25,000,000 South Geysers Project, Series F Revenue Bonds	4/27/83	4/27/83	608,550	52,578	8.640	
\$239,505,000 Reid Gardner Project, Series G Revenue Bonds	3/15/85	3/15/85	4,524,136	425,840	9.413	
\$206,690,000 Power Facilities Series H Revenue Bonds	6/20/86	6/20/86	4,430,520	347,745	7.849	4.713
\$132,000,000 East Branch Enlarg., Series A Water System Revenue Bonds	7/15/86	7/15/86	3,427,165	254,915	7.438	
\$100,000,000 Series B Water System Revenue Bonds	5/05/87	5/05/87	2,564,012	194,817	7.598	
\$ 9,000,000 Series C Water System Revenue Bonds	12/01/87	12/01/87	324,000	31,995	9.875	
\$100,000,000 Series D Water System Revenue Bonds	6/14/88	6/14/88	2,640,510	201,253	7.622	
\$ 9,000,000 Series E Water System Revenue Bonds	11/29/88	11/29/88	324,000	31,995	9.875	
\$160,030,000 Series F Water System Revenue Bonds	3/15/89	4/20/89	2,779,838	189,261	6.808	

**Table 14-9 Actual Bond Sales and Project Interest Rates, by Date of Sale**

Bond Sales	Date of Sale	Delivery Date	Dollar-Years <sup>a</sup> (thousands)	Interest Cost (thousands)	Issue Interest Rate <sup>b</sup> (percent)	Project Interest Rate <sup>c</sup> (percent)
\$100,000,000 Series G Water System Revenue Bonds	3/06/90	3/06/90	2,434,175	172,277	7.077	
\$100,000,000 Series H Water System Revenue Bonds	1/10/91	1/10/91	2,459,172	168,857	6.866	
\$180,000,000 Series I Water System Revenue Bonds	5/14/91	5/14/91	4,366,680	294,090	6.735	
\$649,835,000 Series J Water System Revenue Bonds	1/16/92	1/28/92	12,422,222	745,198	5.999	
\$100,000,000 Series K Water System Revenue Bonds	5/12/92	6/4/92	2,366,783	147,064	6.214	
\$ 9,000,000 Series W Water Bonds	8/19/92	8/19/92	95,250	6,172	6.480	4.621
\$537,830,000 Series L Water System Revenue Bonds	5/19/93	6/02/93	11,414,859	640,518	5.611	4.620
\$ 2,000,000 Series X Water Bonds	9/01/93	9/01/93	26,000	1,247	4.796	4.621
\$ 1,400,000 Series Y Water Bonds	11/30/94	11/30/94	19,483	1,249	6.411	
\$190,000,000 Series M Water System Revenue Bonds	12/9/93	12/21/93	3,911,846	194,981	4.984	
\$152,000,000 Series N Water System Revenue Bonds	3/03/95	3/14/95	2,241,606	122,658	5.472	
\$335,000,000 Series O Water System Revenue Bonds	12/05/95	12/20/95	7,528,890	375,667	4.990	
\$160,000,000 Series P Water System Revenue Bonds	5/07/96	5/22/96	3,553,823	204,524	5.755	
\$266,630,000 Series Q Water System Revenue Bonds	11/05/96	12/04/96	5,481,815	299,846	5.470	4.620
\$ 20,700,000 Series R Water System Revenue Bonds	3/10/97	3/12/97	564,125	36,627	6.493	
\$200,205,000 Series S Water System Revenue Bonds	7/30/97	8/13/97	4,093,110	203,755	4.978	4.615
\$135,665,000 Series T Water System Revenue Bonds	7/30/97	3/04/98	1,310,620	66,942	5.108	
\$207,180,000 Series U Water System Revenue Bonds	11/19/98	12/01/98	4,032,075	200,758	4.979	
\$ 20,580,000 Series V Water System Revenue Bonds	11/19/98	12/01/98	525,100	32,819	6.250	
\$260,995,000 Series W Water System Revenue Bonds	5/01/01	5/17/01	3,659,312	195,822	5.351	4.613
\$160,225,000 Series X Water System Revenue Bonds	5/01/02	6/04/02	2,732,785	139,109	5.090	4.610
\$329,885,000 Series Y Water System Revenue Bonds	7/25/02	3/05/03	4,422,973	222,654	5.034	
\$170,655,000 Series Z Water System Revenue Bonds	10/01/02	10/16/02	1,706,132	75,696	4.437	
\$108,705,000 Series AA Water System Revenue Bonds	10/04/02	3/05/03	2,114,341	104,220	4.929	
\$189,625,000 Series AB Water System Revenue Bonds	3/09/04	3/18/04	4,344,942	173,788	4.000	
\$272,070,000 Series AC Water System Revenue Bonds	12/15/04	1/06/05	4,479,436	209,150	4.669	
\$112,390,000 Series AD Water System Revenue Bonds	6/14/05	7/07/05	1,827,449	90,461	4.950	4.608
\$632,890,000 Series AE Water System Revenue Bonds	4/23/08	5/01/08	8,884,000	436,216	4.910	
\$287,735,000 Series AF Water System Revenue Bonds	3/11/09	3/19/09	2,980,895	431,199	14.465	
\$169,115,000 Series AG Water System Revenue Bonds	11/17/09	12/02/09	2,907,605	311,889	10.727	
\$ 97,675,000 Series AH Water System Revenue Bonds	10/27/10	11/09/10	1,432,014	72,176	5.040	4.610
\$ 92,275,000 Series AI Water System Revenue Bonds	10/27/10	9/07/11	698,716	34,936	5.000	
\$216,930,000 Series AJ Water System Revenue Bonds	10/06/11	10/13/11	2,080,429	100,663	4.839	
\$ 36,370,000 Series AK Water System Revenue Bonds	2/28/12	3/13/12	495,566	23,466	4.735	
\$105,875,000 Series AL Water System Revenue Bonds	2/28/12	9/05/12	739,447	36,972	5.000	
\$183,960,000 Series AM Water System Revenue Bonds	2/28/12	3/05/13	1,440,539	72,027	5.000	
\$ 49,525,000 Series AN Water System Revenue Bonds	9/19/12	9/27/12	646,489	31,783	4.916	
\$317,505,000 Series AO Water System Revenue Bonds	9/19/12	9/27/12	2,830,185	71,219	2.516	
<b>Total</b>			<b>224,458,230</b>	<b>13,121,641</b>		
<b>Portion allocated to Project Interest Rate</b>			<b>63,903,487</b>	<b>2,945,789</b>	<b>4.610</b>	<b>4.610</b>

<sup>a</sup> A unit equivalent to one dollar of principal amount outstanding for one year.

<sup>b</sup> The total interest cost (without regard to discounts paid or to premiums received) divided by the total dollar-years, expressed as a percent.

<sup>c</sup> Determined by dividing cumulative interest costs by cumulative dollar-years, expressed as a percent. (Excluding Oroville Division bonds and revenue bonds for Off-Aqueduct Power Facilities, East Branch Enlargement Facilities, East Branch Extension Facilities, Water System Facilities as defined in the Water Revenue Bond Amendment, Coastal Extension Facilities, or South Bay Aqueduct Enlargement Facilities.)

*Line 13, Subtotal, Water Contractor Payments,* is the total of Lines 2 through 12.

*Line 14, Revenue Bond Cover Adjustments,* represents the credit to contractors resulting from the cover of 25 percent of the annual debt service for Power Facilities Revenue Bonds and Water System Revenue Bonds. Cover is collected as required by the bond resolutions to provide security to the bondholders. If not needed to meet annual bond service, the cover is credited to the contractors in the following year. The annual charges for the following cost components include an amount for bond cover:

- minimum OMP&R component of the Transportation Charge for Off-Aqueduct Power Facilities;
- Water System Revenue Bond Surcharge;
- capital cost component of the Transportation Charge for East Branch Enlargement Facilities;
- capital cost component of the Transportation Charge for Coastal Branch Extension Facilities;
- capital cost component of the Transportation Charge for East Branch Extension Facilities;
- capital cost component of the Transportation Charge for Tehachapi Afterbay; and
- capital cost component of the Transportation Charge for SBA Enlargement.

*Line 15, Rate Management Adjustments,* shows the projected amount of revenue reductions allocated to contractors after repayment of the California Water Fund (see Line 39). Under provisions of the Monterey Amendment, the reduction amount allocated to agricultural contractors is deposited into a trust fund to stabilize payments in water-short years. The urban contractor allocation is applied as a direct reduction in charges.

*Line 16, Federal Payments for Project Operating Costs,* shows federal payments made in accordance with the December 31, 1961, agreement between California and the United States providing for DWR to operate and maintain the San Luis Joint-Use Facilities. According to the January 12, 1972, supplement to the agreement, the Bureau of Reclamation (Reclamation) initially paid 45 percent of operations, maintenance, and replacement (OM&R) costs for those activities. (The percentage does not apply to power costs; Reclamation and DWR each provide their own power to pump water through the joint facilities.)

The percentage paid by Reclamation is periodically reviewed by Reclamation and DWR. The most recent review of the percentage paid by Reclamation was completed in 1987 and resulted in a federal share of 44.09 percent. The amounts in Line 16 are based on the assumption that the federal share will continue at this level for calendar years 2013 through 2022.

*Line 17, Appropriations for Operating Costs Allocated to Recreation,* shows appropriations made under the Davis-Dolwig Act. In passing the Davis-Dolwig Act, the California Legislature declared its intent that, except for funds provided according to Assembly Bill 12 (1966), DWR's budget will include appropriations of monies from the General Fund necessary for enhancement of fish and wildlife and recreation in connection with State water projects.

Annual OMP&R costs allocated to recreation and fish and wildlife enhancement are to be paid by annual appropriations from the General Fund. Through fiscal year 1982–1983, these appropriations totaled \$16.7 million. No additional appropriations have been made from this fund since fiscal year 1982–1983.

Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the



State for costs allocated to recreation and to fish and wildlife enhancement against the amount the SWP owed to the California Water Fund (see line 39). Since the final offset in 1994, DWR has accumulated \$199.3 million in OMP&R costs through fiscal year 2011–2012.

In 2012, the Davis-Dolwig Act was amended to appropriate \$10 million per fiscal year from the Harbors and Watercraft Revolving Fund to cover the OMP&R and capital costs allocated to recreation and fish and wildlife enhancement. Starting in fiscal year 2012–2013, \$7.5 million is being appropriated for on-going OMP&R and capital costs and \$2.5 million is being appropriated to reimburse for past unreimbursed OMP&R and capital costs.

*Line 18, Davis-Grunsky Loan Repayments*, shows the repayments by local agencies of \$72.1 million of loans disbursed as of December 31, 2012. Repayment on any future loans was assumed to be beyond the period covered by the financial analysis.

*Line 19, Revenue Bond Proceeds*, includes bond proceeds classified as special reserves according to the description of revenue bond financing in Line 17 of Table 14-1. Those proceeds, used for capitalized OMP&R costs, revenue bond debt service, and debt service reserves, are not classified as revenue but are included in this line to simplify the financial presentation.

*Line 20, Interest Earnings on Operating Revenues*, includes interest earnings on unexpended proceeds from the sale of general obligation bonds, interest on operating reserves, and other short-term investment earnings on SWP revenues.

*Line 21, Oroville-Thermalito Payments*, shows payments from Pacific Gas & Electric Company, Southern California Edison, and San Diego Gas & Electric Company for power generation at the Oroville facilities. Those

utilities purchased all power generation from Hyatt and Thermalito powerplants before April 1, 1983, in accordance with a power sale contract dated November 29, 1967. The historic amount includes the amounts of final settlement of payments made according to the contract.

*Line 22, Miscellaneous Revenues*, includes all other operating revenues not included in Lines 2 through 21.

*Line 23, Subtotal, Other Revenues*, is the total of Lines 16 through 22.

*Line 24, Total Operating Revenues*, is the total of Lines 13, 14, 15, and 23.

*Line 25, Total Operating Revenues and Capital Resources Revenues*, is the total of Lines 1 and 24.

## Project Expenses

Project expenses include the following:

- operations, maintenance, and power costs;
- deposits to replacement reserves;
- deposits to special reserves;
- capital resources expenditures; and
- debt service.

Revenue bond proceeds earmarked for debt service during construction and the first year's operating expenses are deposited in the Central Valley Water Project Construction Fund and disbursed in accordance with resolutions authorizing the issuance of such bonds.

Water contractor revenues associated with operating costs and debt service attributable to projects financed by revenue bonds are deposited in the Central Valley Water Project Revenue Fund for appropriate disbursement. All other operating revenues are deposited in the California Water Resources Development

**Table 14-10 Operations, Maintenance, Power, and Replacement Costs, by Facility, Composition, and Purpose (in thousands of dollars)**

Feature	Calendar Year												TOTAL
	1962–2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023–2035	
<b>Project Facility</b>													
Feather River facilities	1,450,695	72,104	75,859	78,075	76,915	77,315	78,078	79,342	79,926	81,257	81,079	1,209,414	3,440,059
North Bay Aqueduct	95,152	6,169	6,657	6,569	5,971	5,990	6,041	6,126	6,159	6,249	6,223	91,604	248,910
Delta facilities	826,876	53,431	46,393	54,294	50,315	50,577	42,897	43,591	43,912	44,643	32,972	491,832	1,781,733
Suisun Marsh	51,113	2,893	2,924	2,950	2,861	2,876	2,904	2,951	2,973	3,023	3,016	44,989	125,473
South Bay Aqueduct	347,037	13,874	14,178	14,741	12,919	12,939	13,077	13,241	13,291	13,465	13,388	194,920	677,070
California Aqueduct													
Delta to Edmonston	4,112,477	218,534	235,231	228,893	197,710	205,543	190,384	211,049	203,660	209,727	197,742	2,935,921	9,146,871
Edmonston to Perris	3,631,505	217,106	226,592	222,940	210,679	206,533	214,795	208,263	210,964	210,761	211,773	3,013,696	8,785,607
West Branch	80,874	11,710	9,109	8,144	9,770	8,928	15,772	11,638	11,860	12,184	12,286	254,423	446,698
Coastal Branch	300,343	17,120	19,679	16,995	16,615	16,661	17,666	17,903	17,986	18,236	18,148	265,774	743,126
East Branch Enlargement	121,699	6,434	7,083	6,152	6,001	5,972	5,972	6,008	5,993	6,032	5,959	82,852	266,157
East Branch Extension	34,565	3,466	3,538	3,613	3,380	3,388	3,412	3,459	3,475	3,523	3,507	51,387	120,713
Off-Aqueduct power-generating facilities	1,562,352	26,365	140	147	25	25	25	26	26	26	26	192	1,589,375
Recreation, planning, and CVP negotiations	7,371	686	686	686	686	686	686	686	686	686	686	9,604	23,835
Water quality monitoring	437,659	12,683	12,683	12,683	12,683	11,379	11,379	11,379	11,379	11,379	11,379	159,306	715,971
Davis-Grunsky Act Program	5,483	270	260	250	250	250	250	250	250	250	250	3,250	11,263
<i>Subtotal</i>	<i>13,065,201</i>	<i>662,845</i>	<i>661,012</i>	<i>657,132</i>	<i>606,780</i>	<i>609,062</i>	<i>603,338</i>	<i>615,912</i>	<i>612,540</i>	<i>621,441</i>	<i>598,434</i>	<i>8,809,164</i>	<i>28,122,861</i>
Payments to/credits from PG&E under Comprehensive Agreement	(59,848)	0	0	0	0	0	0	0	0	0	0	0	(59,848)
<b>Total OMP&amp;R Costs</b>	<b>13,005,353</b>	<b>662,845</b>	<b>661,012</b>	<b>657,132</b>	<b>606,780</b>	<b>609,062</b>	<b>603,338</b>	<b>615,912</b>	<b>612,540</b>	<b>621,441</b>	<b>598,434</b>	<b>8,809,164</b>	<b>28,063,013</b>
<b>Composition</b>													
Salaries and expenses of headquarters personnel	3,913,617	181,685	152,340	142,395	97,336	117,109	111,678	121,896	113,313	119,477	109,592	1,703,515	6,883,953
Salaries and expenses of field personnel	5,403,396	233,951	198,584	185,456	169,316	203,183	194,482	211,383	196,791	207,588	190,266	2,975,709	10,370,105
Pumping power													
Used by pumping plants	2,837,347	264,045	357,277	378,851	390,942	338,225	346,560	333,522	353,295	345,228	349,473	4,853,843	11,148,608
Produced by generation plants	(543,165)	(43,478)	(47,606)	(49,994)	(51,116)	(49,757)	(49,684)	(51,192)	(51,162)	(51,155)	(51,200)	(727,973)	(1,767,482)
Off-Aqueduct power generating facilities requirement	1,562,352	26,365	140	147	25	25	25	26	26	26	26	192	1,589,375
Oroville-Thermalito insurance premiums	12,705	277	277	277	277	277	277	277	277	277	277	3,878	19,353
Less portion of costs incurred during construction	(121,051)	0	0	0	0	0	0	0	0	0	0	0	(121,051)
Payments to/credits from PG&E under Comprehensive Agreement	(59,848)	0	0	0	0	0	0	0	0	0	0	0	(59,848)
<b>Total OMP&amp;R Costs</b>	<b>13,005,353</b>	<b>662,845</b>	<b>661,012</b>	<b>657,132</b>	<b>606,780</b>	<b>609,062</b>	<b>603,338</b>	<b>615,912</b>	<b>612,540</b>	<b>621,441</b>	<b>598,434</b>	<b>8,809,164</b>	<b>28,063,013</b>
<b>Project Purpose</b>													
Water supply and power generation	12,450,393	631,005	629,182	625,312	574,960	577,242	571,518	584,092	580,720	589,621	566,614	8,395,504	26,776,163
Recreation and fish and wildlife enhancement	235,407	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	117,000	442,407
Flood control	8,914	850	850	850	850	850	850	850	850	850	850	11,050	28,464
Miscellaneous purposes													
Federal share: San Luis and Delta facilities	352,220	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	260,000	812,220
Other (Davis-Grunsky, drainage, City of Los Angeles)	18,266	1,990	1,980	1,970	1,970	1,970	1,970	1,970	1,970	1,970	1,970	25,610	63,606
Payments to/credits from PG&E under Comprehensive Agreement	(59,848)	0	0	0	0	0	0	0	0	0	0	0	(59,848)
<b>Total OMP&amp;R Costs</b>	<b>13,005,353</b>	<b>662,845</b>	<b>661,012</b>	<b>657,132</b>	<b>606,780</b>	<b>609,062</b>	<b>603,338</b>	<b>615,912</b>	<b>612,540</b>	<b>621,441</b>	<b>598,434</b>	<b>8,809,164</b>	<b>28,063,013</b>

Bond Fund—Systems Revenue Account and are disbursed in accordance with the following four priorities of use, as specified in the Burns-Porter Act:

- SWP OMP&R costs;
- general obligation bond debt service;
- repayment of expenditures from the California Water Fund; and
- deposits to a reserve for future SWP construction.

Project expenses are presented in Lines 26 through 36 of Table 14-2.

*Line 26, Project Operations, Maintenance, Power, and Replacement Costs*, shows the OMP&R portion of the historical and projected costs presented in Table 14-10.

Table 14-10 and Line 26 of Table 14-2 also include the amounts of the operations and maintenance costs for the federal share of joint facilities and those OMP&R costs allocated to recreation, which are intended to be offset by revenues listed in Lines 16 and 17.

Allowances for cost escalations are included in OMP&R costs through 2012. Allowances for additional long-term price escalations in the future are not included in these estimates, because changes in OMP&R costs do not substantially affect the overall results of the financial analysis. (For the most part, changes in OMP&R costs cause direct offsetting changes in operating revenues.)

Power costs make up the largest component of annual operating expenses for the SWP. Assumptions about future power sources and costs are discussed in Chapter 10, Power Resources. Line 26 also includes costs associated with power transactions that result in the sale of power not required for the delivery of water.

*Line 27, Deposits to Replacement Reserves*, shows funds set aside as required by contract for replacing existing SWP facilities. By December 31, 2012, \$149.6 million had been spent for replacement costs; the balance of the replacement reserve as of that date was \$34.7 million.

*Line 28, Deposits to Special Reserves Under Revenue Bond Financing*, includes two significant components: special reserve deposits related to revenue bonds and capital resources revenue carryover from prior years used for construction in the current year. Special reserve deposits are the net of several income and expenditure items. Income items related to revenue bonds are:

- proceeds set aside to pay bond interest during construction (capitalized interest);
- proceeds set aside for first year operating costs (capitalized operations and maintenance);
- water contractor payments or bond proceeds set aside for debt service reserves;
- water contractor payments for revenue bond cover requirements; and
- deposits to and withdrawals from operating reserves to meet day-to-day cash flow requirements.

The 1952–2012 column also includes advances to DWR’s revolving fund for working funds to purchase mobile equipment and to meet day-to-day operating expenses.

The expenditure items related to revenue bonds include:

- debt service cover payments returned to contractors;
- debt service reserve interest payments returned to contractors;
- surplus account funds returned to contractors or applied to meet expenses;

- total capitalized interest paid out; and
- total capitalized operations and maintenance paid out.

Special reserves, reduced over time as reserved amounts, are used for their respective purposes. The amount indicated each year in Line 28 reflects the change from the previous year. A negative number indicates a withdrawal of special reserves to meet expenses, while a positive number indicates a deposit.

*Line 29, Capital Resources Expenditures*, includes the amount of capital resources revenues applied to construction that is shown in Line 35 of Table 14-1. In Table 14-2, these expenditures are funded out of withdrawals from the reserves in Line 28 and do not affect net revenues shown in Line 38.

*Lines 30 and 31, Payment of Debt Service on Bonds Sold through December 31, 2012*, show the total principal and interest payments, respectively, on bonds sold to date. Table 14-11, at the end of this chapter, summarizes payments on general obligation bonds (Series A through Y water bonds), power revenue bonds by project, and water system revenue bonds (Series A through AO).

*Lines 32 and 33, Payments on Projected Future Water Bonds*, include the projected annual bond debt service amounts for future water revenue bonds included on Lines 23, 25, 27, and 29 of Table 14-1 for the East Branch Enlargement, East Branch Extension, SBA Enlargement, and other water system facilities. Assumptions about the bond debt service on these future bonds are that interest costs for the water revenue bonds average 3.5 percent; and that bonds are to be repaid by the end of the project repayment period (2035) or sooner, with maturities commencing in the year following the date of sale and with equal annual bond debt service for the principal repayment period.

*Lines 34 and 35, Total Payments of Bond Debt Service*, show the total of principal payments indicated on Lines 30 and 32, and the total of interest repayments indicated on Lines 31 and 33.

*Line 36, Subtotal, Bond Debt Service*, is the total of Lines 34 and 35.

*Line 37, Total Operating Expenses and Bond Debt Service*, is the total of Lines 26, 27, 28, 29, and 36.

*Line 38, Net System Revenues*, shows the annual amounts of revenues remaining after the payment of operating costs and bond debt service costs.

*Line 39, California Water Fund Repayment*, shows the total amount of repayments made to the California Water Fund to reimburse the fund for monies expended for construction of the State Water Resources Development System.

Repayment of the California Water Fund was completed in 1998. The \$508 million includes the \$306 million of repayments shown in Line 39 and the \$202 million of reimbursement that was credited to the SWP as offsets for recreation and fish and wildlife enhancement expenditures.

*Line 40, Revenues Used for Capital Expenditures*, includes the amounts required annually for financing scheduled capital expenditures. Revenues not needed for operating costs or bond debt services are available for financing SWP capital expenditures.

## Future Costs of Water Service

Estimates of future water costs are useful to contractors for short-range and long-range planning of water needs, operations, and budgets. Unit water charges shown in Table 14-12 represent estimated costs of water delivery by service area for calendar

years 2014 and 2019. The unit rates include costs of existing and future SWP facilities accounted for in Table 14-1 and Table 14-7. The unit water charges are based on the assumption that in 2014 and 2019, the SWP will be able to deliver the entire amount of water requested by each contractor. The unit water charges included in Table 14-12 are listed both as 2014 dollars and as escalated rates reflecting assumed future inflation of 4.0 percent in 2014, and 4.5 percent from 2015 through 2019.

**Table 14-12 Estimated Unit Water Charges for 2014 and 2019, by Service Area (in dollars per acre-foot)**

Service Area and Charge	2014	2019
	(in 2014 dollars)	(in 2019 dollars)
<b>Feather River Area</b>		
Capital; Operations, Maintenance, and Replacement (OM&R)	240	276
<b>North Bay Area</b>		
Capital; OM&R	369	439
Power	40	31
<b>Total</b>	<b>409</b>	<b>470</b>
<b>South Bay Area</b>		
Capital; OM&R	256	294
Power	69	57
<b>Total</b>	<b>325</b>	<b>351</b>
<b>Coastal Area</b>		
Capital; OM&R	1,328	1,302
Power	166	154
<b>Total</b>	<b>1,494</b>	<b>1,456</b>
<b>San Joaquin Area</b>		
Capital; OM&R	145	169
Power	34	28
<b>Total</b>	<b>179</b>	<b>197</b>
<b>Southern California Area</b>		
Capital; OM&R	292	338
Power	199	165
<b>Total</b>	<b>491</b>	<b>503</b>





**Table 14-1 Capital Requirements and Financing, December 31, 2012 (in thousands of dollars)**

Line Number/Item	Calendar Year												
	1952-2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2013-2022	1952-2022
<b>Capital Requirements</b>													
1. Initial Project Facilities	2,202,316	0	0	0	0	0	0	0	0	0	0	0	2,202,316
2. North Bay Aqueduct	109,184	2,984	2,717	6,700	41,000	98,000	149,000	71,000	36,474	0	0	407,875	517,059
3. Delta and Suisun Marsh Facilities	292,295	15,743	21,988	11,825	2,925	1,400	1,400	0	0	0	0	55,281	347,576
4. Final 4 Units at Banks Pumping Plant	43,673	0	0	0	0	0	0	0	0	0	0	0	43,673
5. Coastal Branch Aqueduct	509,244	5	0	0	0	0	0	0	0	0	0	5	509,249
6. West Branch Aqueduct	209,232	0	0	0	0	0	0	0	0	0	0	0	209,232
7. East Branch Enlargement	461,807	318	0	0	0	0	0	0	0	0	0	318	462,125
8. East Branch Improvements	375,393	3,409	350	0	0	0	0	0	0	0	0	3,759	379,152
9. East Branch Extension	191,225	108,000	61,546	6,900	2,300	0	0	0	0	0	0	178,746	369,971
10. South Bay Aqueduct	248,377	4,987	0	0	0	0	0	0	0	0	0	4,987	253,364
11. Power Generation and Transmission Facilities	723,312	0	0	0	0	0	0	0	0	0	0	0	723,312
12. Additional Conservation Facilities	160,677	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	3,170	31,700	192,377
13. Agricultural Drainage Facilities	81,852	1,720	1,720	1,720	1,720	1,720	1,720	1,720	1,720	1,720	1,720	17,200	99,052
14. Other Costs	430,730	104,057	105,904	108,040	59,492	10,822	0	0	0	0	0	388,314	819,044
15. <i>Subtotal, Project Construction Expenditures</i>	<i>6,039,318</i>	<i>244,393</i>	<i>197,394</i>	<i>138,355</i>	<i>110,607</i>	<i>115,112</i>	<i>155,290</i>	<i>75,890</i>	<i>41,364</i>	<i>4,890</i>	<i>4,890</i>	<i>1,088,185</i>	<i>7,127,502</i>
16. Davis-Grunsky Act Program Costs	130,000	0	0	0	0	0	0	0	0	0	0	0	130,000
17. Special Capital Requirements Under Revenue Bond Financing	581,077	36,488	17,842	14,474	9,535	11,899	13,536	8,438	3,283	0	0	115,495	696,572
<b>18. Total Capital Requirements</b>	<b>6,750,395</b>	<b>280,881</b>	<b>215,236</b>	<b>152,829</b>	<b>120,142</b>	<b>127,011</b>	<b>168,826</b>	<b>84,328</b>	<b>44,647</b>	<b>4,890</b>	<b>4,890</b>	<b>1,203,680</b>	<b>7,954,075</b>
19. Power Facilities Capital Requirements	723,312	0	0	0	0	0	0	0	0	0	0	0	723,312
20. Water Facilities Capital Requirements	6,027,083	280,881	215,236	152,829	120,142	127,011	168,826	84,328	44,647	4,890	4,890	1,203,680	7,230,763
<b>Financing of Capital Requirements</b>													
<b>Power Facilities Revenue Bond Proceeds</b>													
21. Power Facilities Revenue Bonds through Series H	1,162,458	0	0	0	0	0	0	0	0	0	0	0	1,162,458
<b>Water System Revenue Bond Proceeds</b>													
22. East Branch Enlargement, Current Bonds	473,603	0	0	0	0	0	0	0	0	0	0	0	473,603
23. East Branch Enlargement, Future Bonds	0	0	0	0	0	0	0	0	0	0	0	0	0
24. East Branch Extension, Current Bonds	204,432	0	0	0	0	0	0	0	0	0	0	0	204,432
25. East Branch Extension, Future Bonds	0	119,337	67,633	7,582	2,527	0	0	0	0	0	0	197,079	197,079
26. South Bay Aqueduct Enlargement, Current Bonds	194,683	0	0	0	0	0	0	0	0	0	0	0	194,683
27. South Bay Aqueduct Enlargement, Future Bonds	0	0	0	0	0	0	0	0	0	0	0	0	0
28. Water System Facilities, Current Bonds	1,855,204	0	0	0	0	0	0	0	0	0	0	0	1,855,204
29. Water System Facilities, Future Bonds	0	264,746	130,609	153,241	103,417	132,208	150,400	93,754	36,474	0	0	1,064,850	1,064,850
30. <i>Subtotal, Water System Revenue Bonds</i>	<i>2,727,922</i>	<i>384,083</i>	<i>198,242</i>	<i>160,823</i>	<i>105,944</i>	<i>132,208</i>	<i>150,400</i>	<i>93,754</i>	<i>36,474</i>	<i>0</i>	<i>0</i>	<i>1,261,929</i>	<i>3,989,850</i>
<b>Other Capital Financing</b>													
31. Initial Project Facilities Bond Proceeds	1,452,452	0	0	0	0	0	0	0	0	0	0	0	1,452,452
32. Davis-Grunsky Act Program Bond Proceeds	130,000	0	0	0	0	0	0	0	0	0	0	0	130,000
33. Application of CA Water Fund Monies (Tideland Oil Revenues)	508,056	0	0	0	0	0	0	0	0	0	0	0	508,056
34. Interim Financing	103,249	(107,702)	12,494	(12,494)	9,698	(9,698)	13,926	(13,926)	3,673	390	390	(103,249)	0
35. Application of Capital Resources Revenues to Construction	566,269	0	0	0	0	0	0	0	0	0	0	0	566,269
36. Revenue Transfers Applied	99,990	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	144,990
37. <i>Subtotal, Other Capital Financing</i>	<i>2,860,016</i>	<i>(103,202)</i>	<i>16,994</i>	<i>(7,994)</i>	<i>14,198</i>	<i>(5,198)</i>	<i>18,426</i>	<i>(9,426)</i>	<i>8,173</i>	<i>4,890</i>	<i>4,890</i>	<i>(58,249)</i>	<i>2,801,767</i>
<b>38. Total Financing of Capital Requirements</b>	<b>6,750,395</b>	<b>280,881</b>	<b>215,236</b>	<b>152,829</b>	<b>120,142</b>	<b>127,011</b>	<b>168,826</b>	<b>84,328</b>	<b>44,647</b>	<b>4,890</b>	<b>4,890</b>	<b>1,203,680</b>	<b>7,954,075</b>

**Table 14-2 State Water Project Revenues and Expenditures, December 31, 2012 (in thousands of dollars)**

Line Number/Item	Calendar Year												1952-2012	1952-2022
	1952-2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2013-2022		
<b>PROJECT REVENUES</b>														
1. Capital resources revenues	814,701	0	0	0	0	0	0	0	0	0	0	0	0	814,701
<b>Water Contractor Payments</b>														
2. Transportation capital	4,624,720	165,230	167,823	170,112	172,485	169,906	161,732	152,044	142,808	132,282	124,174	1,558,596	6,183,316	
3. Transportation minimum	4,010,867	211,423	215,021	198,891	210,705	210,085	212,186	214,308	216,451	218,616	220,802	2,128,488	6,139,355	
4. Transportation variable	5,566,597	286,383	307,329	320,718	266,425	260,400	272,891	267,791	268,777	271,457	265,611	2,787,783	8,354,380	
5. Off-Aqueduct power facilities	3,066,524	84,581	44,724	14,663	9,918	9,729	3,915	3,905	4,239	6,193	5,866	187,732	3,254,256	
6. Delta water charge	2,947,137	186,256	183,479	183,450	183,454	183,454	183,454	183,454	183,454	183,454	183,454	1,837,366	4,784,503	
7. East Branch Enlargement	903,662	40,227	42,066	44,127	43,445	44,801	43,901	44,034	43,229	44,078	42,653	432,560	1,336,222	
8. East Branch Extension	136,478	22,722	28,521	34,587	35,283	37,046	36,408	36,482	36,679	36,922	36,884	341,533	478,012	
9. Coastal Extension	47,897	3,579	4,265	4,623	4,611	4,364	3,363	2,552	3,549	3,674	4,573	39,152	87,049	
10. South Bay Aqueduct Improvements and Enlargement	49,294	17,902	17,810	18,912	18,935	17,888	17,896	17,879	17,875	17,883	17,921	180,901	230,194	
11. Tehachapi East Afterbay	27,177	6,361	6,365	6,896	6,893	6,381	6,367	6,374	6,369	6,387	6,406	64,799	91,976	
12. Water revenue bond surcharge	643,227	73,235	78,241	84,880	85,546	84,505	76,147	80,331	75,778	75,457	72,797	786,917	1,430,143	
13. Subtotal, water contractor payments	22,023,580	1,097,899	1,095,643	1,081,856	1,037,701	1,028,561	1,018,261	1,009,153	999,208	996,403	981,142	10,345,827	32,369,406	
14. Revenue bond cover adjustments	(837,501)	(50,263)	(49,558)	(52,042)	(52,249)	(52,045)	(47,552)	(49,422)	(47,457)	(48,540)	(47,225)	(496,352)	(1,333,853)	
15. Rate management adjustments	(421,150)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(404,700)	(825,850)	
<b>Other Revenues</b>														
16. Federal payments for project operating costs	369,922	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	24,000	240,000	609,922	
17. Appropriations for operating costs allocated to recreation	19,600	0	0	0	0	0	0	0	0	0	0	0	19,600	
18. Davis-Grunsky loan repayments	72,082	1,639	1,266	1,264	1,223	1,218	1,027	960	889	882	882	11,249	83,331	
19. Revenue bond proceeds	652,977	0	0	0	0	0	0	0	0	0	0	0	652,977	
20. Interest earnings on operating revenues	576,623	640	640	640	640	860	860	860	860	860	860	7,720	584,343	
21. Oroville-Thermalito payments	249,279	0	0	0	0	0	0	0	0	0	0	0	249,279	
22. Miscellaneous revenues	184,264	0	0	0	0	0	0	0	0	0	0	0	184,264	
23. Subtotal, other revenues	2,124,748	26,279	25,906	25,904	25,863	26,078	25,887	25,820	25,749	25,742	25,742	258,969	2,383,716	
<b>24. Total operating revenues</b>	<b>22,889,676</b>	<b>1,033,445</b>	<b>1,031,521</b>	<b>1,015,248</b>	<b>970,845</b>	<b>962,124</b>	<b>956,125</b>	<b>945,082</b>	<b>937,030</b>	<b>933,135</b>	<b>919,189</b>	<b>9,703,744</b>	<b>32,593,420</b>	
<b>25. Total operating revenues and capital resources revenues</b>	<b>23,704,377</b>	<b>1,033,445</b>	<b>1,031,521</b>	<b>1,015,248</b>	<b>970,845</b>	<b>962,124</b>	<b>956,125</b>	<b>945,082</b>	<b>937,030</b>	<b>933,135</b>	<b>919,189</b>	<b>9,703,744</b>	<b>33,408,121</b>	
<b>PROJECT EXPENSES</b>														
26. Project operations, maintenance, power, and replacement costs	13,005,353	662,845	661,012	657,132	606,780	609,062	603,338	615,912	612,540	621,441	598,434	6,248,496	19,253,849	
27. Deposits to replacement reserves	149,629	0	0	0	0	0	0	0	0	0	0	0	149,629	
28. Deposits to special reserves	460,647	53,248	56,493	35,038	33,722	28,470	53,701	19,917	12,996	10,574	22,141	326,298	786,944	
29. Capital resources expenditures	686,932	0	0	0	0	0	0	0	0	0	0	0	686,932	
<b>Payments of Bond Debt Service</b>														
30. Principal repayments on bonds sold through December 31, 2012 (current bonds)	2,976,959	177,264	174,022	177,486	180,410	174,589	146,682	151,032	152,120	145,199	148,906	1,627,710	4,604,669	
31. Interest on bonds sold through December 31, 2012 (current bonds)	6,011,659	116,164	108,916	101,027	94,051	86,393	78,772	72,700	66,100	59,483	53,269	836,875	6,848,534	
32. Future water bond principal repayments	0	8,805	11,215	18,212	24,596	29,537	36,029	43,980	50,059	53,771	55,727	331,931	331,931	
33. Future water bond interest payments	0	10,620	15,363	21,853	26,786	29,573	33,103	37,041	38,715	38,168	36,212	287,434	287,434	
<b>34. Total principal</b>	<b>2,976,959</b>	<b>186,069</b>	<b>185,237</b>	<b>195,698</b>	<b>205,006</b>	<b>204,126</b>	<b>182,711</b>	<b>195,012</b>	<b>202,179</b>	<b>198,970</b>	<b>204,633</b>	<b>1,959,641</b>	<b>4,936,600</b>	
<b>35. Total interest</b>	<b>6,011,659</b>	<b>126,784</b>	<b>124,279</b>	<b>122,880</b>	<b>120,837</b>	<b>115,966</b>	<b>111,875</b>	<b>109,741</b>	<b>104,815</b>	<b>97,651</b>	<b>89,481</b>	<b>1,124,309</b>	<b>7,135,968</b>	
36. Subtotal, bond debt service	8,988,618	312,853	309,516	318,578	325,843	320,092	294,586	304,753	306,994	296,621	294,114	3,083,950	12,072,568	
<b>NET REVENUES</b>														
<b>37. Total Operating Expenses and Bond Debt Service</b>	<b>23,291,178</b>	<b>1,028,945</b>	<b>1,027,021</b>	<b>1,010,748</b>	<b>966,345</b>	<b>957,624</b>	<b>951,625</b>	<b>940,582</b>	<b>932,530</b>	<b>928,635</b>	<b>914,689</b>	<b>9,658,744</b>	<b>32,949,922</b>	
38. Net system revenues	413,199	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	458,199	
<b>Application of Net System Revenues</b>														
39. California Water Fund repayment	305,765	0	0	0	0	0	0	0	0	0	0	0	305,765	
40. Revenues used for capital expenditures	104,490	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	149,490	

**Table 14-11 Annual Debt Service on Bonds Sold through December 31, 2012 (in thousands of dollars)**

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds <sup>a</sup>		Pyramid Project Revenue Bonds <sup>b</sup>		Alamo Project Revenue Bonds <sup>b</sup>		Small Hydro Project Revenue Bonds <sup>b</sup>		Water System Facilities Water System Revenue Bonds <sup>c</sup>		Subtotal		Devil Canyon-Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds <sup>d,e</sup>		South Geysers Project Revenue Bonds <sup>b</sup>		Bottle Rock Project Revenue Bonds <sup>b</sup>		East Branch Enlargement Project Water System Revenue Bonds <sup>f</sup>		Coastal Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds <sup>f</sup>		South Bay Enlargement Facilities Water System Revenue Bonds <sup>f</sup>		Tehachapi East Afterbay Facilities Water System Revenue Bonds <sup>f</sup>		Grand Total	
	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
1964	0	3,333	0	0	0	0	0	0	0	0	0	0	0	3,333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,333
1965	0	11,114	0	0	0	0	0	0	0	0	0	0	0	11,114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,114
1966	0	18,764	0	0	0	0	0	0	0	0	0	0	0	18,764	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,764
1967	0	26,911	0	0	0	0	0	0	0	0	0	0	0	26,911	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,911
1968	0	37,761	0	3,876	0	0	0	0	0	0	0	0	0	41,637	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41,637
1969	0	47,460	0	10,448	0	0	0	0	0	0	0	0	0	57,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57,908
1970	0	53,290	0	13,145	0	0	0	0	0	0	0	0	0	66,435	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,435
1971	0	63,035	0	13,145	0	0	0	0	0	0	0	0	0	76,180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76,180
1972	0	69,149	1,260	13,112	0	0	0	0	0	0	0	0	1,260	82,261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,260	82,261	
1973	1,200	69,347	1,330	13,042	0	0	0	0	0	0	0	0	2,530	82,389	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,530	90,097	
1974	3,000	69,533	1,400	12,969	0	0	0	0	0	0	0	0	4,400	82,502	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,400	90,210	
1975	5,000	69,366	1,475	12,893	0	0	0	0	0	0	0	0	6,475	82,259	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,475	89,967	
1976	7,000	69,657	1,555	12,811	0	0	0	0	0	0	0	0	8,555	82,468	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,555	90,176	
1977	10,200	69,298	1,635	12,727	0	0	0	0	0	0	0	0	11,835	82,025	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,835	89,733	
1978	12,700	69,286	5,775	12,537	0	0	0	0	0	0	0	0	18,475	81,823	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,475	89,531	
1979	13,650	68,660	11,585	12,275	0	0	0	0	0	0	0	0	25,235	80,935	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,235	88,643	
1980	16,050	67,941	3,265	11,739	0	7,900	0	0	0	0	0	0	19,315	87,580	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,315	95,288	
1981	18,050	67,078	4,885	11,444	0	7,292	0	0	0	0	0	0	22,935	85,814	0	7,708	0	5,312	0	0	0	0	0	0	0	0	0	0	0	0	22,935	98,834		
1982	19,250	66,130	17,920	10,968	0	7,292	0	0	0	0	0	0	37,170	84,390	0	7,708	0	14,347	0	0	0	0	0	0	0	0	0	0	0	0	0	37,170	106,445	
1983	20,520	65,111	21,110	10,147	0	7,292	0	2,449	0	3,727	0	0	41,630	88,726	900	7,708	0	35,719	0	4,777	0	6,017	0	0	0	0	0	0	0	0	0	42,530	142,947	
1984	21,785	64,036	10,005	9,013	640	7,292	0	4,198	0	3,727	0	0	32,430	88,266	955	7,647	0	35,719	0	5,647	0	10,315	0	0	0	0	0	0	0	0	0	33,385	147,594	
1985	22,555	62,892	12,700	8,628	675	7,238	0	4,198	0	3,727	0	0	35,930	86,683	1,010	7,583	9,425	27,209	0	5,647	0	10,315	0	0	0	0	0	0	0	0	0	46,365	137,437	
1986	23,830	61,705	11,435	7,859	715	7,377	0	4,263	0	3,537	0	0	35,980	84,741	1,070	7,515	3,805	32,882	0	5,516	1,240	10,315	0	4,021	0	0	0	0	0	0	42,095	144,990		
1987	25,495	60,452	11,715	7,188	790	7,513	265	4,329	0	3,348	0	4,952	38,265	87,782	1,135	7,442	4,860	32,605	0	5,386	1,305	10,253	0	9,651	0	0	0	0	0	0	45,565	153,119		
1988	26,770	59,120	6,685	6,664	830	7,447	280	4,314	345	3,348	710	11,037	35,620	91,930	1,205	7,366	5,065	32,295	580	5,521	1,390	10,849	995	9,875	0	0	0	0	0	0	44,855	157,836		
1989	28,145	57,790	33,705	5,513	875	7,378	295	4,298	365	3,328	1,148	14,373	64,533	92,680	1,275	7,284	7,820	27,557	709	5,646	1,565	11,592	1,078	10,104	0	0	0	0	0	0	76,980	154,863		
1990	29,385	56,436	10,385	4,301	930	7,305	320	4,279	405	3,304	1,227	19,555	42,652	95,180	1,355	7,198	6,675	29,781	761	5,596	1,678	11,491	1,134	10,048	0	0	0	0	0	0	54,255	159,294		
1991	30,365	55,034	12,055	3,922	980	7,227	335	4,257	430	3,276	2,129	27,569	46,294	101,285	1,435	7,107	7,170	29,302	818	5,535	1,791	11,376	1,197	16,856	0	0	0	0	0	0	58,705	171,461		
1992	31,745	54,193	14,135	2,985	2,395	5,308	1,260	3,086	960	2,553	5,108	28,412	55,603	96,537	1,520	7,010	8,950	27,188	1,934	4,136	4,575	7,942	2,583	22,241	0	0	0	0	0	0	75,165	165,054		
1993	33,390	52,670	13,755	2,237	1,525	5,688	755	3,300	445	2,640	4,576	29,965	54,446	96,500	1,610	6,907	8,820	26,953	901	4,256	3,264	8,385	3,040	21,428	0	0	0	0	0	0	72,081	164,429		
1994	35,075	51,231	35,225	934	1,580	5,634	780	3,274	695	2,569	5,910	38,223	79,265	101,865	1,705	6,799	77,105	26,273	1,588	4,072	3,374	8,270	4,567	20,752	0	0	0	0	0	0	167,604	168,031		
1995	36,280	49,703	0	0	1,635	5,570	805	3,242	745	2,536	8,064	37,879	47,529	98,930	1,810	6,684	5,420	19,230	1,695	4,004	3,521	8,133	4,979	20,499	0	0	0	0	0	0	64,954	157,480		
1996	37,520	48,024	0	0	2,320	5,486	1,055	3,203	3,135	2,464	10,459	58,171	54,489	117,348	1,920	6,561	49,465	18,130	3,043	3,908	3,682	7,974	4,771	23,240	0	0	0	0	0	0	117,370	177,161		
1997	37,215	46,365	0	0	1,695	5,274	875	3,073	585	2,283	14,375	67,909	54,745	124,904	2,035	6,432	7,515	15,255	1,825	3,696	3,861	7,741	6,300	23,702	0	1,981	0	76	0	0	76,281	183,787		
1998	37,295	44,736	0	0	1,770	5,237	910	3,059	625	2,258	16,755	68,584	57,355	123,874	2,155	6,295	5,045	16,144	1,935	3,637	4,030	7,509	6,760	23,966	0	1,829	0	229	0	0	77,280	183,483		
1999	38,220	43,132	0	0	1,845	5,141	960	3,004	680	2,229	18,701	68,086	60,406	121,592	2,285	6,160	9,310	11,660	2,081	3,549	4,240	7,319	7,518	25,032	0	1,808	65	2,930	0	0	85,905	180,050		
2000	39,510	41,469	0	0	1,925	5,045	1,010	2,955	610	2,197	19,536	66,900	62,591	118,566	2,420	6,040	9,870	11,194	1,950	3,448	4,470	7,097	8,974	24,651	0	1,808	915	2,928	0	0	91,190	175,732		
2001	40,600	39,751	0	0	2,250	4,949	1,155	2,902	780	2,272	20,945	66,417	65,730	116,291	2,565	5,912	10,365	10,758	2,045	3,344	4,720	6,855	9,425	24,188	0	2,131	950	2,889	0	0	95,800	172,368		
2002	41,740	37,984	0	0	2,460	4,619	1,280	2,758	950	2,192	23,918	63,126	70,348	110,679	2,720	5,773	11,185	10,010	2,225	3,074	5,265	6,323	9,817	23,099	335	2,311	1,245	3,481	0	0	103,140	164,750		
2003	43,590	36,159	0	0	2,500	4,429	1,315	2,671	940	2,110	23,441	60,465	71,786	105,834	2,885	5,626	2,135	9,313	2,335	2,889	5,445	5,938	9,988	18,479	245	2,310	1,105	4,278	0	0	95,924	154,667		
2004	45,730	34,244	0	0	2,500	4,291	1,330	2,598	970	2,059	26,396	58,988	76,926	102,180	3,055	5,470	2,210	9,214	2,425	2,758	5,610	5,633	9,883	20,583	220	2,298	2,045	4,747	0	91	0	55	102,374	153,029
2005	46,985	32,242	0	0	2,727	4,097	1,461	2,487	1,327	1,987	23,064	58,061	7																					

Table 14-11 Annual Debt Service on Bonds Sold through December 31, 2012 (in thousands of dollars)

(continued)

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds <sup>a</sup>		Pyramid Project Revenue Bonds <sup>b</sup>		Alamo Project Revenue Bonds <sup>b</sup>		Small Hydro Project Revenue Bonds <sup>b</sup>		Water System Facilities Water System Revenue Bonds <sup>c</sup>		Subtotal		Devil Canyon-Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds <sup>b,c</sup>		South Geysers Project Revenue Bonds <sup>b</sup>		Bottle Rock Project Revenue Bonds <sup>b</sup>		East Branch Enlargement Project Water System Revenue Bonds <sup>c</sup>		Coastal Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds <sup>c</sup>		South Bay Enlargement Facilities Water System Revenue Bonds <sup>c</sup>		Tehachapi East Afterbay Facilities Water System Revenue Bonds <sup>c</sup>		Grand Total	
	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
2018	25,435	3,011	0	0	4,870	1,092	2,866	730	2,516	541	64,599	42,018	100,286	47,392	6,910	2,045	104	277	720	215	1,246	549	19,864	10,352	1,680	1,010	6,121	7,291	7,046	7,271	2,705	2,370	146,682	78,772
2019	16,975	1,804	0	0	4,537	890	2,766	616	2,184	430	74,228	39,587	100,690	43,327	7,325	1,682	109	273	762	191	1,266	503	23,208	9,523	1,094	947	6,404	7,046	7,339	6,964	2,835	2,244	151,032	72,700
2020	17,405	956	0	0	5,555	687	3,361	498	2,797	323	69,474	36,534	98,592	38,998	7,765	1,298	113	268	891	165	1,481	455	23,860	8,483	1,927	912	6,840	6,746	7,681	6,619	2,970	2,106	152,120	66,050
2021	8,595	318	0	0	2,648	449	1,692	358	1,153	197	74,348	33,565	88,436	34,887	8,230	890	961	262	929	131	2,255	396	23,775	7,435	2,091	848	7,341	6,419	8,053	6,254	3,128	1,961	145,199	59,483
2022	1,885	60	0	0	5,324	343	5,062	293	1,208	146	72,032	30,461	85,511	31,303	8,725	458	1,008	215	856	95	2,202	299	28,339	6,357	2,872	787	7,634	6,073	8,463	5,874	3,296	1,808	148,906	53,269
2023	85	7	0	0	1,028	96	552	55	638	91	79,172	27,403	81,475	27,652	0	0	558	166	557	59	1,887	196	22,976	5,197	2,073	686	7,776	5,704	9,014	5,470	3,530	1,646	129,846	46,776
2024	35	3	0	0	664	51	381	31	429	61	79,948	23,676	81,457	23,822	0	0	349	138	442	32	1,501	93	22,874	4,154	2,156	602	8,078	5,325	9,453	5,038	3,701	1,478	130,011	40,682
2025	0	0	0	0	149	23	106	16	171	41	76,101	19,825	76,527	19,905	0	0	140	120	62	10	61	9	28,335	3,054	1,729	513	8,233	4,927	9,731	4,580	3,787	1,297	128,605	34,415
2026	0	0	0	0	154	18	110	13	178	34	71,974	16,293	72,416	16,358	0	0	254	113	64	8	63	7	9,875	1,680	1,808	437	14,419	4,521	11,241	4,106	4,599	1,110	114,739	28,340
2027	0	0	0	0	397	13	283	9	264	26	82,889	12,960	83,833	13,008	0	0	328	100	166	6	162	5	9,243	1,222	1,785	356	18,477	3,804	12,362	3,553	5,157	883	131,513	22,937
2028	0	0	0	0	0	0	0	0	140	15	66,965	9,215	67,105	9,230	0	0	443	84	0	0	0	0	9,972	793	2,815	289	24,392	2,884	13,898	2,940	5,962	628	124,587	16,848
2029	0	0	0	0	0	0	0	0	149	8	76,217	5,925	76,366	5,933	0	0	462	61	0	0	0	0	2,935	376	2,976	148	25,450	1,664	14,553	2,251	6,243	332	128,985	10,765
2030	0	0	0	0	0	0	0	0	0	0	6,240	2,161	6,240	2,161	0	0	105	38	0	0	0	0	0	0	0	0	1,195	406	5,655	1,534	65	23	13,260	4,162
2031	0	0	0	0	0	0	0	0	0	0	6,555	1,846	6,555	1,846	0	0	110	33	0	0	0	0	0	0	0	1,255	346	5,945	1,253	70	20	13,935	3,498	
2032	0	0	0	0	0	0	0	0	0	0	6,885	1,514	6,885	1,514	0	0	120	27	0	0	0	0	0	0	0	1,320	284	6,235	957	70	17	14,630	2,799	
2033	0	0	0	0	0	0	0	0	0	0	7,245	1,163	7,245	1,163	0	0	125	21	0	0	0	0	0	0	0	1,380	218	4,000	644	75	13	12,825	2,059	
2034	0	0	0	0	0	0	0	0	0	0	7,605	794	7,605	794	0	0	130	14	0	0	0	0	0	0	0	1,445	149	4,210	440	85	9	13,475	1,406	
2035	0	0	0	0	0	0	0	0	0	0	8,000	407	8,000	407	0	0	140	7	0	0	0	0	0	0	0	1,525	76	4,425	226	90	5	14,180	721	
<b>Total</b>	<b>1,582,400</b>	<b>2,386,523</b>	<b>244,995</b>	<b>246,522</b>	<b>107,838</b>	<b>195,867</b>	<b>60,951</b>	<b>101,071</b>	<b>49,141</b>	<b>81,995</b>	<b>1,706,442</b>	<b>1,823,528</b>	<b>3,751,767</b>	<b>4,835,506</b>	<b>139,165</b>	<b>283,872</b>	<b>448,356</b>	<b>570,706</b>	<b>74,515</b>	<b>115,846</b>	<b>156,407</b>	<b>227,974</b>	<b>496,268</b>	<b>619,806</b>	<b>44,064</b>	<b>46,481</b>	<b>198,696</b>	<b>180,301</b>	<b>196,884</b>	<b>138,149</b>	<b>69,136</b>	<b>46,454</b>	<b>5,575,258</b>	<b>7,065,095</b>

<sup>a</sup>Principal and interest schedule adjusted to reflect early redemption of bonds.  
<sup>b</sup>Allocated portions of Power Facilities Revenue Bonds and Water System Revenue Bonds.  
<sup>c</sup>Interest includes a minimum fee for Water System Revenue Bonds Series AB.





## **Chapter 15**

### **SWP Education and Information**

*A variety of drought-tolerant plants at the Save Our Water exhibit at the California State Fair.*

## Significant Events in 2012

**W**ater year 2012 was drier than water year 2011. However, a wet spring and above-average reservoir storage enabled the State Water Project (SWP) to meet 65 percent of contractors' requests.

On May 2, 2012, State and federal water officials dedicated a pair of new permanent pipelines (known as the "Intertie") that link the SWP's California Aqueduct and the Central Valley Project's (CVP) Delta-Mendota Canal, near Tracy, south of the Delta. The \$28 million project gives the SWP and Central Valley Project closer operational ties and greater flexibility in coordinating water supply operations.

During 2012, the Department of Water Resources (DWR) paid tribute to two major 50-year milestone events in SWP history, commemorating the first water deliveries from the South Bay Aqueduct and the groundbreaking at Sisk Dam and San Luis Reservoir.

DWR issued Phase 1 of the Climate Action Plan and achieved gains in renewable energy and in cutting carbon emissions to meet climate change challenges.

In September, an annual DWR mailer alerted more than 270,000 valley residents of their local flood risks.

*Information for this chapter was provided by the Public Affairs Office.*

The Department of Water Resources (DWR) Public Affairs Office (PAO) produces and distributes news and program information describing California's water resources, DWR, its mission, programs, and activities. PAO disseminates information by way of news releases, interviews, Internet posts, and both printed and electronic publications. Other avenues include artwork, films, graphics, photography, public meetings, social media, and special events.

## News Topics

Selected highlights below provide examples of PAO's 2012 outreach efforts and news media response related to DWR's water policy, programs, and activities.

### Snow Surveys

DWR experts conduct five monthly Sierra snow surveys, ending in late April or early May, when snowpack typically is at its peak. By analyzing snow depth and water content, experts gauge the Sierra snowpack's potential for producing snowmelt runoff for water use. Typically, Sierra snowpack produces about one-third of California's annual water supply.

DWR promotes media coverage of its monthly snow surveys to help inform water agency managers and educate the public about snowpack conditions and water supply prospects. In 2012, the monthly surveys were closely covered because they found far less snowfall than had occurred in the heavy precipitation year of 2011.

Snowfall in 2012 lagged significantly behind the prior year. On May 1, the fifth and final DWR snow survey found that the average statewide snow water content was just 40 percent of average. On May 1, 2011, water content in the statewide Sierra snowpack had been 190 percent of average.

## State Water Project Allocations

By late May, DWR set the State Water Project (SWP) final allocation figure at 65 percent of state water contractors' requests for deliveries. Though below the 80 percent deliveries made in 2011, a 65 percent allocation is not regarded as unusually low.

In 2010, the SWP had delivered 50 percent of requested water. In the three prior dry years, SWP allocations were 60 percent in 2007, 35 percent in 2008, and 40 percent in 2009. The most recent 100 percent allocation occurred in 2006. Meeting 100 percent allocations is not easy to achieve, even in wet years, due to Delta pumping restrictions to protect threatened and endangered fish.

## Bay Delta Conservation Plan

On July 25, the Governor joined federal officials to outline revisions to the proposed Bay Delta Conservation Plan (BDCP). The revised BDCP will constitute a new path forward designed to achieve the dual goals of a reliable California water supply and a healthy Bay-Delta ecosystem vital to the State's economy.

To fix California's aging water system, proposed changes to the BDCP will include construction of water intake facilities with a total capacity of 9,000 cubic feet per second (cfs)—down from an earlier proposal of 15,000 cfs—and a Delta conveyance designed to use gravity flow to maximize energy efficiency and minimize environmental impact.



## Intertie Links SWP and CVP

On May 2, State and federal water officials dedicated a pair of new permanent pipelines (known as the “Intertie”) that link the SWP’s California Aqueduct and the Central Valley Project’s (CVP) Delta-Mendota Canal, near Tracy, south of the Delta. The \$28 million project gives the two cooperating water systems greater operational flexibility. The concept originated in the summer of 2001 when a leak occurred in the California Aqueduct. A temporary pipeline was rigged to help the SWP continue to make deliveries, with the CVP’s assistance. The shared State-federal pipelines measure 500 linear feet, linking the systems at a point where their major parallel water conduits are closest.

## Climate Change Activities

In June, DWR released Phase 1 of the Climate Action Plan to dramatically curtail DWR’s greenhouse gas emissions in coming decades. The plan will enable DWR to cut gas emissions linked to global warming by 50 percent under 1990 levels within seven years. It sets the stage for an 80 percent emissions reduction by 2050.

Key components of the action plan include terminating a DWR contract with a coal-fired plant in Nevada, increasing pump and turbine efficiency throughout the SWP, and boosting the proportion of SWP electricity from renewable and high-efficiency natural gas-fired sources.

In August, DWR took part in ceremonies opening a new natural gas energy plant in Lodi that will enable the SWP to cut greenhouse gas emissions. The 280-megawatt Lodi Energy Center will give the SWP a more abundant supply of cleaner energy. DWR is the largest of the project participants associated with the Lodi Energy Center, with contract rights to almost 100 megawatts.

## Central Valley Flood Protection Plan

To help cut future Central Valley flood risks, DWR’s flood experts worked closely with the Central Valley Flood Protection Board (CVFPB) on adoption and implementation of the systemwide Central Valley Flood Protection Plan. The Central Valley Flood Protection Act of 2008 directed DWR to prepare the Central Valley Flood Protection Plan for CVFPB adoption. The plan provides a conceptual framework to promote more protection and reduce flood risks for one million residents throughout the Sacramento and San Joaquin valleys and property valued at \$70 billion.

Created in 2011 by DWR’s Division of Flood Management, vetted in a series of public meetings in early 2012 by the CVFPB, and adopted unanimously by the CVFPB in June, the plan will foster regional planning efforts to develop and advocate specific flood management projects to improve flood protection and reduce flood risks. The authorizing legislation calls for the plan to be updated at 5 year intervals.

Water experts from throughout the west honored DWR and the CVFPB for their actions advancing the comprehensive plan to safeguard lives and property in the Central Valley. In September, the Floodplain Management Association presented them its “Award of Excellence.”

Also in September, DWR’s annual Flood Risk Notification Program, part of the California FloodSAFE Initiative, issued flyers to more than 270,000 residents of 17 valley counties alerting them to their potential flood risks.

## SWP Delivery Reliability Report

In July 2012, DWR released the *State Water Project Delivery Reliability Report 2011*. It described the existing and future conditions for SWP water supply that are expected if no significant improvements are made to convey water past the Sacramento–San Joaquin Delta or to store the more variable runoff that is expected with climate change.

## SWP Historic Events

In May, Director Cowin, DWR managers, and other water agency leaders gathered at Bethany Reservoir to commemorate the first SWP water delivery, which took place in 1962. Water was pumped from Bethany Reservoir into the South Bay Aqueduct for delivery to San Francisco Bay Area water users.

During 2012, DWR noted the 50th anniversary of the groundbreaking for Sisk Dam and San Luis Reservoir, an event featuring participation by then-President John F. Kennedy and then-Governor Edmund G. "Pat" Brown, Sr. DWR posted a video of President Kennedy's remarks at the dedication ceremonies, which occurred on August 18, 1962.

## SWP Publications

DWR maintains approximately 40 brochures describing the SWP, its mission, and facilities. The brochures are periodically issued in updated versions and distributed statewide to educate the public about the SWP. In 2012, new brochures were issued that described the function and operation of the Coastal Branch Aqueduct, Silverwood Lake, and the John E. Skinner Delta Fish Protective Facility.

## E-News

Each weekday, PAO compiles and electronically distributes news articles and commentaries on water-related issues to more than 5,000 subscribers. These news clips inform DWR staff of water issues relevant to DWR and its programs.

## DWR Magazine

Published three times a year, this new magazine features articles describing DWR programs, staff, and activities. It has evolved in recent years from separate publications. Increasingly oriented toward an electronic readership, it has become a source for news of interest to DWR employees.

## DWR Tours Program

The DWR tours program regularly attracts foreign and domestic tour groups. The SWP and its water supply mission is the major attraction. During 2012, a full schedule of foreign, domestic, and school tour groups received briefings and escorted trips to selected SWP facilities. As a basic component of DWR's Training Program, tours were provided for recently hired DWR employees to the Sacramento-San Joaquin Delta and to Oroville Dam and Lake Oroville.

During 2012, DWR welcomed 16 foreign tours with 296 visitors to DWR's Headquarters and SWP facilities. Tour groups came from throughout the United States and 17 foreign countries, including Albania, Australia, Brazil, Burkina Faso, Chad, China, Djibouti, France, Germany, Japan, Mali, Mauritania, the Netherlands, Niger, Senegal, Uzbekistan, and Vietnam.

There were also a number of domestic and school tours as follows:

- Oroville Field Division hosted 26 groups (6 foreign) with 793 participants;
- Delta Field Division hosted 17 groups with 1,287 participants;
- Romero Overlook Visitors Center hosted 60 tour groups (21 foreign) with 1,920 participants;
- San Joaquin Field Division hosted three contractor groups;
- Southern Region Office hosted 8 tour groups (all foreign) with 107 participants; and
- Vista del Lago Visitors Center welcomed 43 tour groups (1 foreign) totaling 1,281 participants.

Figure 15-1 shows the SWP visitors center locations.



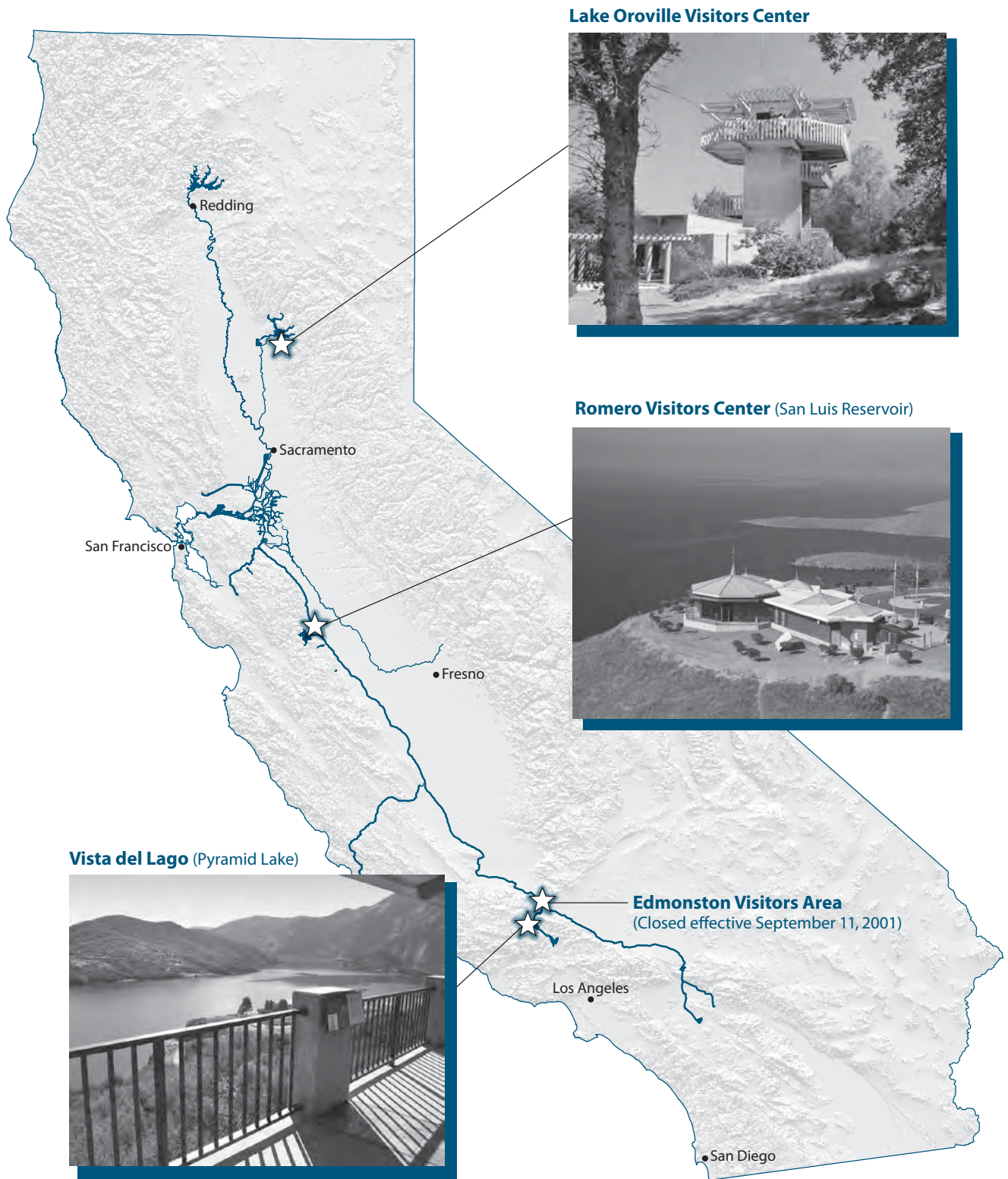


Figure 15-1 Visitors Centers on the SWP

## Community Relations and Recreational Safety

In 2012, PAO staff continued to educate the public about water conservation and the Save Our Water program through DWR's award-winning water-efficient gardens at The Farm at the California State Fair. PAO staff also assisted at other Save Our Water booths at the California Green Fair and at the Humboldt County Fair.

Also at the California State Fair, DWR partnered with the California Department of Fish and Wildlife to host "Wet 'n Wild," a special display designed to educate the public about California's native animals and how water affects their habitats.

PAO staff provided exhibits at the following events:

- San Francisco Flower & Garden Show;
- Green California Summit, Sacramento;
- Apricot Fiesta, Patterson;
- Big Fresno Fair;
- Earth Day at Sierra College, Rocklin;
- Girl Scouts 100th Anniversary, Sacramento; and
- Humboldt County Fair.

In 2012, DWR worked with Radio Disney for the fourth year to educate younger Californians about water conservation and water safety via public service announcements, online at six Radio Disney websites, and at Northern California regional events.

DWR also co-sponsors and coordinates "Catch A Special Thrill" (C.A.S.T.) fishing events for children with special needs. During 2012, C.A.S.T. events were held at Lake Oroville, Lake del Valle, Castaic Lake, Silverwood Lake, and Lake Perris. PAO staff assisted at the O'Neill Forebay C.A.S.T. event.

DWR created an advertisement to feature Lakes and Reservoirs Appreciation Week, July 1–7. The ad was published statewide in *Via* magazine.

DWR continued its partnerships with communities to offer nine Aquatic Adventure Camps throughout the summer months, teaching water safety to children, especially those who would most benefit from positive youth development. The camps utilized facilities at Lake Oroville, Lake del Valle, Castaic Lake, and Lake Perris.

## SWP Recreation Outreach Program

The goal of the SWP recreation outreach program is to educate the public about the many recreational opportunities available at SWP facilities. PAO staff attends community events, State and county fairs, State and federally sponsored events, and forms partnerships with State, federal, and community groups.

### SWP Recreation Outreach Events

DWR, California Department of Parks and Recreation, and several partner agencies co-sponsored or attended the following recreation outreach events in 2012:

- Sacramento International Sportsmen's Exposition, Sacramento;
- Manufacturers' 24th Annual RV Show, Pleasanton;
- Wild Steelhead Festival, Healdsburg;
- Fred Hall Fishing Tackle & Boat Show, Long Beach;
- Stockton Asparagus Festival, Stockton;
- Elk Grove Western Festival, Elk Grove;
- North State Sportsman Expo, Chico;
- Jack Splash Club/Oroville YMCA Healthy Kids Day/Kiwanis Egg Hunt, Oroville;
- Oroville Feather Fiesta Days, Oroville;
- Jack Splash Club/Oroville YMCA Fit-N-Fun Day, Oroville;

- Oroville Hooked on Fishing Not Drugs, Oroville;
- C.A.S.T., New Melones Lake, Sonora;
- C.A.S.T., Lake Oroville, Oroville;
- C.A.S.T., Lake del Valle, Livermore;
- C.A.S.T., Lake Perris, Perris
- C.A.S.T., O’Neill Forebay, Gustine;
- Butte County Fair Sportsmen’s Expo, Gridley;
- Pittsburg Seafood Festival, Pittsburg;
- Save the Auburn Ravine Salmon and Steelhead Festival, Lincoln;
- Feather River Salmon Festival, Oroville; and
- Stanislaus River Salmon Festival, Knight’s Ferry.

The Jack Splash Club was created by PAO as a way to interest and educate kids and their families in the Oroville area about safe water recreation. The Oroville YMCA helps manage the club because of its water safety programs, fitness programs, and community standing.

### **SWP Recreation Outreach Publications**

The following recreation outreach publications were made available to the public:

- *Family Getaway Map*
- *Family Getaway Guide*
- *Lake Oroville Recreation*
- *Best Bass Fishing Lake*
- *Lake Oroville Floating Campsite*
- *Upper Feather River Lakes*
- *South Bay Aqueduct/Lake del Valle/ Bethany Reservoir*
- *San Luis Joint-Use Complex*
- *Quail Lake*
- *Pyramid Lake*
- *Castaic Lake*
- *Lake Perris*
- *Silverwood Lake*
- *Fishing along the State Water Project*

- *State Water Project Recreation Facilities*
- *Water Safety along the SWP*
- *Quagga Warning Card*
- *Quagga Info Sheet*

The *Family Getaway Map* and *Family Getaway Guide* were developed to expand public awareness of California’s rivers, lakes, and reservoirs.

## **School Education Program**

The School Education Program’s goal is to provide students and educators with a statewide perspective on water issues such as conservation, conveyance systems, and the water cycle. PAO staff develops and promotes high-quality materials, providing them free of charge to schools, educators, and water districts. Program achievements for 2012 include are described below.

### **Public Events and Outreach**

PAO staff provided displays of DWR’s interactive children’s exhibits and other educational materials at:

- the Capitol Area Science Education Leaders Conference, Stockton;
- the Sacramento Municipal Utility District’s Youth Energy Summit, Sacramento;
- the Bay Area Environmental Education Resource Fair, San Rafael;
- AgVenture, San Joaquin County;
- the Bay Area Schools Environmental Conference, San Jose;
- the Sacramento Area Creeks Council’s Creek Week Event, Sacramento;
- Kids Day in the Park, Rancho Cordova;
- State Scientists’ Day, Sacramento;
- Amador County Farm Day, Plymouth; and
- the California Science Teachers Association Conference, San Jose.



PAO staff organized a team of DWR judges from multiple divisions and provided a special award at the Sacramento Regional Science and Engineering Fair in Sacramento.

PAO staff also organized a team of DWR scientists and engineers to participate in the Sacramento Area Science Project and Powerhouse Science Center's Dinner with a Scientist Night in Sacramento.

## Publications and Materials

Curriculum materials and children's videos were provided to California teachers and water agencies through the *Water Facts & Fun* online catalog and order form and during promotional events. During 2012, the following materials were purchased or reprinted:

- 7,000 *California's Amazing Delta* book covers;
- 8,500 *California Water Works & Why It Does* student booklets;
- 10,600 California Environmental Education Interagency Network resource brochures;
- 5,000 *KIDS: Discover Storm Water* student activity booklets;
- 7,500 hamburger activity sheets for students;
- 3,000 *Water & Me* student activity booklets;
- 7,500 water conservation pledge sheets;
- 250 *Water Fun* teachers' guides;
- 10,000 *Water Fun* student booklets; and
- 350 *Project WET* (Water Education for Teachers) books, which were provided to pre-service teachers who participated in Project WET training workshops.

## Education and the Environment Initiative

The Education and the Environment Initiative (EEI) is a free, State-sponsored K-12 curriculum that teaches science and history-social science standards through

an environmental perspective. The EEI enhances environmental education goals and academic standards already established by the California Department of Education.

EEI curriculum materials were printed for distribution through the California Department of Education's California Regional Environmental Education Coordinators Network to teachers who attended DWR-approved professional development training and workshops. The following materials were printed in various formats that included teachers' and students' editions, dictionaries, information cards, and visual aids:

- 2,760 *Earth's Water*;
- 9,200 *Our Water: Sources and Uses*;
- 6,920 *The Dynamic Nature of Rivers*;
- 2,760 *Biodiversity: The Keystone to Life on Earth*; and
- 2,310 *Liquid Gold: California's Water*.

## Collaboration and Partnerships

DWR's School Education Program seeks to partner with other entities with similar interests and goals to pool resources in educating California's youth on the importance of water resources. During 2012, PAO staff participated in the following collaborative activities/meetings:

- DWR's Water Education Committee meeting;
- Project WET Advisory Committee, the California Environmental Education Interagency Network Committee;
- California Urban Water Conservation Council's education subcommittee and the Northern California Water Educators Collaborative;
- Creek Week Planning Committee and the Kids' Art Contest Winner Selection Subcommittee; and

- Caring for Our Watersheds contest, sponsored by Agrium and the Center for Land-Based Learning.

Additional collaborative efforts included PAO staff working with the following:

- California Department of Education's California Regional Environmental Education Community Network;
- California Environmental Education Foundation Teacher Institute;
- Floodplain and Delta Ecology Institute for teachers, co-sponsored with the San Joaquin County Office of Education; and
- Delta Studies Institute for teachers, co-sponsored with the San Joaquin County Office of Education.



# Glossary

This glossary contains terms used in the text of Bulletin 132-13 as well as additional terms related to water resources.

## A

**abundance** The number of organisms of a particular kind in a population. (See also, abundance index.)

**abundance index** (fisheries) A relative measure of the weight or number of fish in a stock, a segment of the stock (e.g. the spawners), or an area. Often available in time series, the information is collected through scientific surveys or inferred from fishery data.

**acre-foot** The volume of water that would cover one acre to a depth of one foot; equal to 43,560 cubic feet or 325,851 gallons.

**adaptive management** The process of improving management effectiveness by learning from the results of carefully designed decisions or experiments.

**adipose fin** A small fleshy fin with no rays on the topside of a fish located between the fin on the back and the tail fin.

**afterbay** A storage reservoir downstream of a power plant or large reservoir that regulates fluctuating discharges from a hydroelectric power plant or a pumping plant.

**agricultural drainage** (1) The process of directing excess water away from root zones by natural or artificial means, such as by using a system of drains placed below ground surface level (also called subsurface drainage); (2) the water drained away from irrigated farmland.

**alluvium** Unconsolidated soil strata deposited over time by flowing water.

**amphipod** A small crustacean with a flat (laterally compressed) body belonging to the group Amphipoda, found in both marine and freshwater environments.

**anadromous** Fish that live the majority of their life cycle in the sea and return to freshwater streams to spawn.

**anion** An atom or a molecule in which the total number of electrons is greater than the total number of protons, giving it a net negative electrical charge.

**aquifer** A geologic formation that stores water underground (called groundwater), especially one that yields significant quantities of water to wells or springs.

**arid** Describes a climate or region in which precipitation is so deficient in quantity or occurs so infrequently that intensive agricultural production is not possible without irrigation.

**artificial recharge** The addition of surface water to a groundwater basin by human activity, such as putting surface water into spreading basins.

**average annual runoff** The average value of annual runoff volume calculated for a selected period of record, at a specified location, such as a dam or stream gauge.

**average year water demand** Demand for water under average hydrologic conditions for a defined level of development.

## B

**balanced water conditions** These exist when upstream reservoir storage releases, plus other inflows, approximately equal the water supply needed to (1) satisfy Sacramento Valley and Sacramento-San Joaquin Delta in-basin needs, including Delta water quality requirements, and (2) meet export needs. DWR and the Bureau of Reclamation jointly decide when balanced or excess water conditions exist.

**beneficial use** Water quality beneficial use categories for water are designated by State law. Beneficial uses of the waters of the State that may be protected against water quality degradation include, but are not limited to, domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

**benthic organisms** Aquatic animals without backbones that dwell on or in the bottom sediments of fresh or salt water.

**biological assessment** A document prepared as part of the Endangered Species Act, Section 7 process to determine whether a proposed major construction activity under the authority of a federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat.

**biological opinion** A document required by the Endangered Species Act stating the opinion of the U.S. Fish and Wildlife Service or National Marine Fisheries Service on whether or not a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

**biota** Living organisms of a region, as in a stream or other body of water.

**brackish water** Water containing dissolved minerals in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses. Considerably less saline than seawater.

**bromide** A salt which naturally occurs in small quantities in seawater; a compound of bromine.

**Burns-Porter Act** (California Water Code Section 12930 et seq.) Formally known as the California Water Resources Development Bond Act, this act passed the Legislature in 1959 and was approved by voters in 1960. It provided initial funding of \$1.75 billion in general obligation bonds and authorized construction of the State Water Project facilities.

**bypass** As part of a flood management system, a natural overflow area or channel that allows excessive floodwaters to flow or be diverted from a main river channel to prevent water from overflowing the main river channel.

## C

**CALFED Bay-Delta Program** (CALFED) A federal and State multiagency program established by the 1994 Bay-Delta Accord. CALFED's mission was to develop and implement a long-term comprehensive plan that would restore ecological health and improve water management in the Bay-Delta system. In 2010, all functions and responsibilities of CALFED were assumed by the Delta Stewardship Council.

**California Data Exchange Center** (CDEC) CDEC installs, maintains, and operates an extensive hydrologic data collection network including automatic snow reporting gauges for the DWR Cooperative Snow Surveys Program and precipitation and river stage sensors for flood forecasting. CDEC provides a centralized location to store and process real-time hydrologic information gathered cooperatively throughout the State.

**California Irrigation Management Information System** (CIMIS) A network of automated weather stations that are owned and operated cooperatively between DWR and local agencies. The stations are installed in most of the agricultural and urban areas of the State and provide farm and large landscape irrigation managers and researchers with "real-time" weather data to estimate crop and landscape evapotranspiration rates and make irrigation management decisions.

**California Water Resources Simulation Model** (CALSIM) A computer model that simulates operations of SWP and Central Valley Project water delivery systems. CALSIM II is a planning tool that was jointly developed by DWR and the Bureau of Reclamation. The model's inputs include hydrologic

data for specified study planning years, water demands, infrastructure and regulatory change, and other factors. Outputs include deliveries to water contractors, river flows, reservoir changes, Delta hydrologic parameters, and other data.

**cation** An atom or a molecule in which the total number of protons is greater than the total number of electrons, giving it a net positive electrical charge.

**Central Valley Project deliveries** The volume of water imported to a given area through the Central Valley Project.

**ciliates** Single-celled organisms, characterized by the presence of many hair-like structures called cilia used for locomotion and for feeding.

**climate change** Any significant change in the measures of climate lasting for an extended period of time. This includes major changes in temperature, precipitation, or wind patterns, among other things, that occur over several decades or longer.

**coded wire tag** A small piece of stainless steel wire injected into the snout of juvenile salmon and steelhead. Each tag is etched with a binary code that identifies a fish release group.

**conjunctive use** Application of surface water and groundwater to meet the demand for a beneficial use. Coordinated and planned management of both surface water and groundwater resources to maximize the efficient use of the resources; that is, the planned and managed operation of a groundwater basin and a surface water storage system combined through a coordinated conveyance infrastructure. Water is stored in the groundwater basin for later planned use by intentionally recharging the basin during years of above-average surface water supply.

**conservation facilities** Reservoir facilities that store water and make it available for later use.

**consultation** The process required of a federal agency under Section 7 of the Endangered Species Act when any activity authorized, carried out, or conducted by that agency may affect a listed species or designated critical habitat; consultation is with the U.S. Fish and Wildlife Service or National Marine Fisheries Service and may be either informal or formal.

**conveyance** Provides for the movement of water and includes the use of natural watercourses and constructed facilities including open channels, pipelines, diversions, fish screens, distribution systems, and pump lifts.

**conveyance facilities** Canals, pipelines, pump lifts, ditches, etc., used to move water from one area to another.

**cryptomonad** A single-celled, photosynthetic organism with two flagella that inhabits both marine and freshwater environments.

**cyanobacteria** Photosynthetic, nitrogen-fixing, colonial bacteria found in a wide variety of terrestrial and aquatic habitats, often referred to as “blue-green algae.”

## D

**Davis-Grunsky Act** Authorized in 1960 as part of the Burns-Porter Act, this act provides construction loans for local domestic water projects and agricultural water conservation projects.

**Decision 1485 operating criteria** The standards for operating the Central Valley Project and the SWP under Water Right Decision 1485 for the Sacramento-San Joaquin Delta and Suisun Marsh, adopted by the State Water Resources Control Board in August 1978.

**Delta outflow** Freshwater outflow from the Sacramento-San Joaquin Delta to protect the beneficial uses within the Delta from the incursion of saline water.

**Delta outflow index** A calculated approximation of the seaward freshwater outflow as it passes Chipps Island near Pittsburg, beyond the confluence of the Sacramento and San Joaquin rivers.

**desalting** A process to reduce the salt concentration of seawater or brackish water.

**diatom** Microscopic marine or freshwater colonial algae that have cell walls made out of silica.

**dinoflagellate** A small, single-celled organism with flagella and an internal skeleton of cellulose-like plates found in both marine and freshwater environments and best known as causers of harmful algal blooms.

**discount rate** The interest rate used to calculate the present value of future benefits and future costs or to convert benefits and costs to a common time basis.

**dissolved organic compounds** Carbon-based substances dissolved in water.

**dissolved oxygen** The amount of oxygen dissolved in water or wastewater, usually expressed in milligrams per liter, parts per million, or percent of saturation.



**distinct population segment** A subdivision of a species that is treated as a species for purposes of listing under the Endangered Species Act. The smallest division of a taxonomic species that can be protected under the Endangered Species Act.

**drainage area** The area of land from which water drains into a river; for example, the Sacramento River Basin, in which all land area drains into the Sacramento River. Also called a watershed, drainage basin, or river basin.

**drought preparedness** The magnitude and probability of economic, social, or environmental consequences that would occur as a result of a sustained drought under a given study plan.

**drought condition** Hydrologic conditions during a defined period, greater than one dry year, when precipitation and runoff are much less than average.

**drought year supply** The average annual supply of a water development system during a defined drought period.

**Delta Simulation Model 2 (DSM2)** A hydrodynamic and water quality simulation model used to simulate water quality conditions in the Sacramento-San Joaquin Delta. The model is frequently used to evaluate potential changes in Delta conditions (salinity, flow, and water level) associated with changes in flow patterns in the Delta.

## E

**ecosystem restoration** The activity of improving the condition of natural landscapes and biotic communities.

**effluent** Wastewater or other liquid, treated or in its natural state, flowing from a treatment plant or process.

**electrical conductivity** The measure of the ability of water to conduct an electrical current, the magnitude of which depends on the dissolved mineral content of the water.

**endangered species** An animal or plant species in danger of extinction throughout all or a significant portion of its range.

**entrainment** The unintended diversion of fish (or other aquatic organisms) into an unsafe passage route. The incidental trapping of any life stage of fish within waterways or structures that carry water being diverted for use elsewhere. Fish are considered “entrained” when they enter a diversion point, which for the SWP is Clifton Court Forebay.

**environmental impact report** A report done to analyze project or program impacts on a variety of resources under the California Environmental Quality Act.

**environmental impact statement** A report done to analyze project or program impacts on a variety of resources under the National Environmental Policy Act.

**environmental water** The water for wetlands, for the instream flow in a major river or the Bay-Delta, or for a designated wild and scenic river.

**escapement** The portion of an anadromous fish population that escapes commercial and recreational fisheries and reaches its freshwater spawning grounds.

**estuary** A semi-closed coastal body of water where the lower course of a river enters the sea, influenced by tidal action where the tide meets the river flow, resulting in brackish water.

**evapotranspiration** The amount of water transpired by plants, retained in plant tissues, and evaporated from plant tissues and surrounding soil surfaces. (See also, reference evapotranspiration.)

**excess water conditions** Periods when it is agreed that releases from upstream reservoirs plus unregulated flow exceeds Sacramento Valley in-basin uses plus exports. DWR and the Bureau of Reclamation jointly decide when balanced or excess water conditions exist. During excess water conditions, sufficient water is available to meet all beneficial needs, and the SWP and Central Valley Project are not required to supplement the supply with water from reservoir storage.

**export** An amount of water transported from one source or location to another.

## F

**firm yield** The maximum annual supply of a water development project under drought conditions, for some specified level of demand.

**flagellates** Organisms with one or more whip-like structures called flagella, which are used for locomotion or feeding.

**floodplain** A strip of relatively level land bordering a stream or river that is often inundated during times of high water.

**forages** Food for animals, especially crops grown to feed horses, cattle, and other livestock.

**forebay** A reservoir at the intake of a pumping plant or power plant to stabilize water levels; also a storage basin for regulating water for percolation into groundwater basins.

**fork length** A measurement used frequently for fish length when the tail has a fork shape; projected straight distance between the tip of the snout and the fork of the tail.

**freeboard** The height of the physical top of a levee above a specified water surface elevation. This serves as a factor of safety for containing water in the stream or reservoir without overtopping the levee or dam.

**fry** Young, recently hatched fish that are able to swim and catch their own food.

## G

**greenhouse gas emissions** Also referred to as carbon intensity or carbon footprint, greenhouse gases trap heat in the atmosphere and contribute to climate change. They include carbon dioxide, methane, nitrous oxide, and fluorinated gases.

**grilse** A term that generally refers to young adult salmonids of a certain length and age. Grilse are often 55–65 centimeters (22–26 inches) in length. They are assumed to be two years old, and adults are assumed to be age three and older.

**groundwater** Water located beneath the land surface that fills the pore spaces of the alluvium, soil, or rock formation in which it is situated. It excludes soil moisture, which refers to water held by capillary action in the upper unsaturated zones of soil or rock.

**groundwater bank** Groundwater banking refers to the practice of recharging specific amounts of water in a groundwater basin during wet or above-average years, which can later be withdrawn and used by the depositing entity.

**groundwater basin** An alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and having a definable bottom.

**groundwater recharge** The natural or intentional infiltration of surface water into the zone of saturation (i.e., into groundwater).

**groundwater storage capacity** The volume of void space that can be occupied by water in a given volume of a formation, aquifer, or groundwater basin.

**groundwater table** The upper surface of the zone of saturation in an unconfined aquifer.

## H

**habitat** The place or environment where a plant or animal naturally lives and grows (with a group of particular environmental conditions).

**habitat conservation plan** A plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species; usually includes measures to minimize impacts, and may include provisions for permanently protecting land, restoring habitat, and relocating plants or animals to another area. Required before a federal Endangered Species Act incidental take permit may be issued.

**halophyte** A plant capable of growing in salty soil.

**haptophyte** A kind of unicellular marine phytoplankton typically covered in tiny scales or plates composed of carbohydrates and calcium deposits.

**hydraulic barrier** (1) A barrier created by injecting fresh water to control seawater intrusion in an aquifer, or created by water injection to control migration of contaminants in an aquifer. (2) A barrier developed in the estuary by release of fresh water from upstream reservoirs to prevent intrusion of seawater into the body of fresh water.

**hydrologic balance** An accounting of all water inflow to, water outflow from, and changes in water storage within a hydrologic unit over a specified period of time.

**hydrologic basin** Where, conceptually, any drop of water that falls in the basin will flow to a stream or groundwater basin within it. It is a larger set of which a subset is the groundwater basin that can be within a hydrologic basin. DWR's hydrologic regions are collections of the larger hydrologic basins.

**hydrologic region** DWR divides California into 10 hydrologic regions, corresponding to the state's major water drainage basins: North Coast, San Francisco Bay, Central Coast, South Coast, Sacramento River, San Joaquin River, Tulare Lake, North Lahontan, South Lahontan, and Colorado River.

**hydrology** The science dealing with the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere.

## I

**in-lieu recharge** The practice of providing surplus surface water to historic groundwater users, thereby leaving groundwater in storage for later use.

**ion exchange** Processes of purification, separation, and decontamination of aqueous and other ion-containing solutions with solid ion exchangers (such as sodium carbonate used for water softening).

**instream use** Use of water within its natural watercourse as specified in an agreement, water rights permit, etc. For example, the use of water for navigation, recreation, fish and wildlife, aesthetics, and scenic enjoyment.

**integrated regional water management** A comprehensive approach for determining the appropriate mix of demand and supply management options to provide long-term, reliable water supply at the lowest reasonable cost and with the highest possible benefits to customers, economic development, environmental quality, and other social objectives.

**invertebrate** An animal that lacks a backbone.

## J

**joint points of diversion** The ability of the SWP to use Jones Pumping Plant as a point of diversion and the Central Valley Project to use Banks Pumping Plant as a point of diversion. The SWP and Central Valley Project may use one another's diversion facilities under certain conditions.

**joint powers agreement** An agreement entered into by two or more public agencies that allows them to jointly exercise any power common to the contracting parties. This is defined in Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the California Government Code.

**joint-use facilities** Those portions of the SWP that serve both SWP and Central Valley Project functions, and in which both State and federal agencies participate in the construction and use; specifically, the San Luis complex and Reaches 3, 4, 5, 6, and 7 of the California Aqueduct.

**jurisdictional dam** Artificial barriers, together with appurtenant works, which are 25 feet or more in height or have an impounding capacity of 50 acre-feet or more, which are regulated by the DWR Division of Safety of Dams.

## K

**kathablepharid** A specific type of cryptomonad.



## L

**land subsidence** The lowering of the natural land surface in response to: earth movements; the lowering of fluid pressure or groundwater level; consolidation of underlying soils; removal of underlying supporting materials by mining (oil and gas extraction); compaction caused by wetting; or oxidation of organic matter in soils (peat soil being converted to gas).

**legal Delta** The legal geographical boundaries of the Sacramento-San Joaquin Delta, as established by the Delta Protection Act of 1959, and as defined in California Water Code Section 12220.

**listed species** A species, subspecies, or distinct population segment that has been added to the federal list of endangered and threatened wildlife and plants. The term also applies to a species or subspecies added to the California list of endangered or threatened plants and animals.

## M

**maximum contaminant level** The highest drinking water contaminant concentration allowed under federal and State Safe Drinking Water Act regulations.

**mitigation** (1) An action or set of actions designed to avoid, minimize, reduce, eliminate, or compensate for adverse environmental impacts due to an agency activity or program. (2) Reduction of human activities that affect global climate change; includes strategies to reduce greenhouse gas emissions.

**Monterey Agreement** An agreement executed in December 1994 among DWR and the SWP water contractors to address fundamental contract issues by amending the long-term water supply contracts.

**Monterey Amendments** Amendments to the long-term water supply contracts for the SWP entered into by DWR and most (27 of 29) of the SWP water contractors in 1995 and 1996 as implementation of the terms of the Monterey Agreement.

**multipurpose project** A project, usually a reservoir, designed to serve more than one purpose, whose costs are normally allocated among the different functions it provides. For example, a project that provides water supply, flood control, and generates hydroelectricity.

**N**

**natural community conservation planning (NCCP)** A process that promotes multispecies and multihabitat management and conservation through cooperative efforts among public agencies, private landowners, and other interests within a plan area. It provides a framework for minimizing impacts on plant communities and wildlife from proposed development projects.

**natural recharge** Natural replenishment of an aquifer generally from snowmelt and runoff through seepage from the surface.

**net groundwater** The amount of groundwater extraction in excess of deep percolation.

**nonreimbursable costs** The part of project costs allocated to general statewide or national beneficial purposes and funded from general revenues, rather than by water users.

**normalized demand** The process of adjusting actual water use in a given year to account for unusual events such as dry weather conditions, government price support programs for agriculture, rationing programs, or other unusual conditions.

**O**

**operational yield** An optimal amount of groundwater that should be withdrawn from an aquifer system or a groundwater basin each year. It is a dynamic quantity that must be determined from a set of alternative groundwater management decisions subject to goals, objectives, and constraints of the management plan.

**Operations Criteria and Plan (OCAP)** (1) The document titled, "Long-Term Central Valley Project Operations Criteria and Plan," that serves as a baseline description of the facilities and operating environment of the Central Valley Project and the SWP and identifies factors influencing the physical and institutional conditions and decision-making processes under which the projects currently operate. Regulatory and legal requirements are explained and alternative operating models and strategies described. (2) The document titled, "Central Valley Project Operations Criteria and Plan" (CVP-OCAP, 2004), that describes the laws, regulations, and other criteria applicable to operations of the Central Valley Project that were in effect from 1991 through 2003.

**Operations Criteria and Plan biological opinion** (1) The document titled, "Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and the State Water Project" (NOAA Fisheries, 2009).

(2) The December 15, 2008, memorandum from the U.S. Fish and Wildlife Service to the Bureau of Reclamation that comprises the U.S. Fish and Wildlife Service biological opinion on the coordinated operations of the Central Valley Project and the SWP.

**otolith** Ear bone of a fish. Otoliths often show seasonal or annual rings that can be used to determine age.

**outflow** The amount of applied water and conveyance water leaving the service area. Also conveyance outflow.

## P

**parr** The developmental life stage of salmon and trout when the young have developed parr marks (vertical bars or spots on the sides of the fish) and are actively feeding in fresh water.

**pelagic** Inhabiting the water column as opposed to being associated with the bottom; generally occurring anywhere from the water's surface down to, but not including, the bottom.

**pelagic fish** Fish that live in open water, often near the surface.

**perched groundwater** Groundwater supported by a zone of material of low permeability located above an underlying main body of groundwater.

**perennial yield** The maximum quantity of water that can be annually withdrawn from a groundwater basin over a long period of time without developing an overdraft condition.

**permeability** The capability of soil or other geologic formations to transmit water.

**phytoplankton** Minute plants, such as algae, that live suspended in bodies of water and drift with the current.

**precipitation** A deposit on the earth of hail, rain, mist, sleet, or snow. It is the common process by which atmospheric water becomes surface or subsurface water.

**project yield** The water supply attributed to all features of a project, including integrated operation.

**proposal solicitation package (PSP)** As part of the formal solicitation for grant applications, a PSP provides detailed instructions on the mechanics of submitting proposals and specific information on submittal requirements.

**public trust doctrine** A legal doctrine recognizing public rights in the beds, banks, and waters of navigable waterways, and the State's power and duty to exercise continued supervision over them as trustee for the benefit of the people.

**pump lift** (1) The vertical distance that a pump will raise water. (2) The distance between the groundwater table and the overlying land surface.

**pumped storage project** A hydroelectric power plant and reservoir system using an arrangement whereby water released for generating energy during peak load periods is stored and pumped back into the upper reservoir, usually during periods of reduced power demand.

**pumping-generating plant** A plant that can either pump water or generate electricity, depending on the direction of water flow.

**punch list** A list of tasks or "to-do" items necessary for the completion of a construction project.

## Q

**Quantification Settlement Agreement** A complex package of agreements that defines the rights to a portion of Colorado River water for four water agencies in Southern California, provides for water transfers, and establishes a Joint Powers Authority to oversee restoration of the Salton Sea. The *Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement* was signed in October 2003 by Coachella Valley Water District, Imperial Irrigation District, The Metropolitan Water District of Southern California, the San Diego County Water Authority, and the federal government.

## R

**radial gates** Gates used to control the flow of water into or from a reservoir, canal, or pipeline, or through a channel. Each gate can close under its own weight and is operated independently by remote control.

**radio-telemetry** Automatic measurement and transmission of data from remote sources via radio to a receiving station for recording and analysis.

**rate structure** Designates the rate basis for cost recovery (e.g., flat, uniform, tiered, etc.). Block/tiered rates are assumed to provide cost signals to consumers. Costs can include capital, operation and maintenance, financing, environmental compliance (documentation, permitting, and mitigation), etc.

**raw water** Water found in the environment, such as rainwater, surface water (e.g., lakes, streams, and the ocean), or groundwater, that has not been

treated. Most water is considered raw until it is treated for consumption or used for agriculture or industry.

**reach** On the California Aqueduct, a specific segment of the canal, identified by a number, which is the smallest unit of the SWP identified in water supply contracts for cost allocation and repayment purposes.

**rearing** Refers to the amount of time that juvenile fish spend feeding in nursery areas of rivers, lakes, streams, and estuaries before migration.

**reasonable and prudent alternatives** Alternative actions that can be implemented in a manner consistent with the intended purpose and scope of a project, are economically and technologically feasible, and would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

**recharge** Water added to an aquifer or the process of adding water to an aquifer. Groundwater recharge occurs either naturally as the net gain from precipitation or artificially as the result of human influence.

**recharge basin** A surface facility constructed to infiltrate surface water into a groundwater basin.

**recreation** Water-dependent recreation activities that are consumptive (e.g., parks), flat-water (e.g., boating), or flow-based (e.g., whitewater rafting).

**recycled water** (1) The application of treated water/reclaimed water to meet a beneficial use, supplanting a potable or potentially potable supply. (2) Treated municipal, industrial, or agricultural wastewater to produce water that can be reused.

**redd** A shallow nest of fish eggs covered with gravel in a streambed.

**reference evapotranspiration** (ET<sub>o</sub>) The evapotranspiration rate from an extended surface of 3 to 6 inch (8 to 15 centimeter) tall green grass cover of uniform height, actively growing, completely shading the ground, and not short on water (the reference evapotranspiration reported by CIMIS).

**reliability planning** Water reliability management planning is done by comparing the costs of taking actions to maintain or increase reliability to the costs of accepting less reliability. On this basis, accepting the costs of the adverse effects of less than 100 percent reliability could be a legitimate planning decision. Providing full water supply to meet 100 percent of projected future water demand is not the planning goal, rather, the goal is to find the justified level of reliability.

**reoperation** See system reoperation.



**repayment reach** California Aqueduct reaches are delineated for the purpose of making project repayment as equitable as possible. The reaches are generally numbered consecutively from the Delta, with Reach 1 being first. Repayment reaches vary greatly in length. (See also, reach.)

**required instream flow** The amount of water required for instream use by agreement, water rights permit, or State/federal acts.

**reused water** The application of previously used water to meet a beneficial use, whether treated or not prior to the subsequent use. (See also, recycled water.)

**return flow** The portion of withdrawn water not consumed by evapotranspiration or system losses which returns to its source or to another body of water.

**reverse osmosis** A method to remove salts and other constituents from water by forcing water through membranes.

**riparian area** The area of land adjacent to a stream, lake, or wetland with vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas. Riparian areas provide important wildlife habitat (including fish habitat, when sufficient to overhang, extend into, or fall into the water).

**riparian [water] right** A right to use surface water derived from the fact that the land in question abuts the banks of a stream or other water source (lake or pond). These rights are senior to most appropriative water rights.

**run (of fish)** A group of fish of the same species whose upstream spawning migration timing is associated with the seasons, e.g., fall, spring, summer, and winter runs. Members of a run may interbreed with fish of another run.

**runoff** The volume of surface flow from an area during a specified period. Natural runoff is the portion of precipitation that runs off the land and makes up the natural flow in rivers. Incidental runoff is the portion of precipitation that would have been used by natural vegetation but now contributes to runoff. This is a result of roads, paved areas, building roofs, land drainage systems, fields developed for irrigation, and other changes in land use.

## S

**sabellid polychaete** A segmented marine worm that lives in a tube that it builds.

**saline intrusion** The movement of salt water into a body of fresh water. It can occur in either surface water or groundwater bodies.

**salinity** Generally, the concentration of mineral salts dissolved in water. Salinity may be expressed in terms of a concentration, weight (total dissolved solids), electrical conductivity, or osmotic pressure. When describing salinity influenced by seawater, salinity often refers to the concentration of chlorides in the water. (See also, total dissolved solids.)

**salmonid** A fish species belonging to the salmon family, including salmon and trout.

**salt-water barrier** A physical facility or method of operation designed to prevent the intrusion of salt water into a body of fresh water.

**salvage (fish)** At the SWP and Central Valley Project fish protective facilities, fish are removed from export water, transported, and released away from the influence of the water diversion facilities.

**sediment** Soil or mineral material transported by water and deposited in streams or other bodies of water.

**seepage** The gradual movement of water into, through, or from a porous medium. Also, the infiltration of water into the soil from canals, ditches, laterals, watercourses, reservoirs, storage facilities, or other bodies of water, or from a field.

**service area** The geographic area served by a water agency.

**smolt** A juvenile salmonid fish that has assumed the silvery color of the adult and, while migrating toward the ocean, is undergoing physiological changes that will allow it to live in salt water.

**snowpack** The annual accumulation of snow in mountain areas.

**soluble minerals** Naturally occurring substances capable of being dissolved.

**special status species** Plants or animals legally protected under either the federal or California Endangered Species Act or the California Fish and Game Code; those species not currently protected by statute but considered to be rare or endangered under the California Environmental Quality Act; and species considered by the scientific community to be sufficiently rare to qualify for such listing (e.g., candidate species for listing as threatened or endangered, species of concern to the Department of Fish and Wildlife or U.S. Fish and Wildlife Service, or rare plants identified by the California Native Plant Society).

**species of concern** An informal term referring to a species that might be in need of conservation action.

**spillway** The section of a dam designed to permit water to pass over its crest; a weir or channel taking overflow from the dam. The spillway serves as a safety channel to prevent erosion or overtopping of the dam.

**sprinkler irrigation** A method of irrigation in which the water is sprayed, or sprinkled, through the air to the ground surface.

**stakeholder** Individuals or groups who can affect or be affected by an organization's activities; individuals or groups with an interest or "stake" in what happens as a result of a decision or action.

**State Water Project deliveries** The volume of water imported to a given area through the State Water Project.

**statewide water management systems** These include physical facilities (more than 1,200 State, federal, and local reservoirs, as well as canals, treatment plants, and levees), which make up the backbone of water management in California; and statewide water management programs, which include water-quality standards, monitoring programs, economic incentives, water-pricing policies, and statewide water-efficiency programs such as appliance standards, labeling, and education.

**strategic plan** The long-term goals of an organization or program and an outline of how they will be achieved (e.g., adopting specific strategies, approaches, and methodologies).

**stocking** Releasing hatchery-raised fish into a water body for the purposes of supplementing existing populations or creating new ones for fishing (same as planting).

**streamflow** The rate of water flow past a specified point in a channel.

**subsidence** See land subsidence.

**surface storage** Surface storage uses reservoirs to collect water for later release and use.

**surface supply** Water supply obtained from streams, rivers, lakes, and reservoirs.

**system reoperation** Changes to existing water system operations and management procedures for existing reservoirs and conveyance facilities to increase their water-related benefits.

**T**

**threatened species** An animal or plant species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

**tidal wetlands** The margins of an estuary that are periodically inundated by tides; includes all habitats within the elevation range between the lowest and highest tides: intertidal mudflats, regularly inundated tidal marsh plains, tidal channels within the marsh, and infrequently inundated wetland-upland transition zones at the edge of the upland.

**total capital cost** The total monetary cost of options required for “turnkey” implementation, including environmental and third-party impact mitigation, storage, conveyance, energy, capitalized operations and maintenance, administrative costs, planning costs, legal costs, and engineering costs.

**total dissolved solids** The quantity of the residual minerals dissolved in water that remain after evaporation of a solution.

**transpiration** An essential physiological process in which plant tissues give off water vapor into the atmosphere.

**tributary** A stream that flows into a larger stream or other body of water.

**tubificid worm** An aquatic worm with a small, thin, segmented body.

**turbidity** A measure of the cloudiness of water caused by the presence of suspended particles in the water that attenuate or reduce light penetration. Turbidity in natural waters may be composed of organic and/or inorganic constituents and may have direct implications to drinking water treatment.

**turnout** The point at which water is diverted from a main channel or water delivery facility to a distributing facility; a structure through which a water contractor takes delivery of water.

**U**

**unimpaired flow** The flow past a specified point on a natural stream that is unaffected by stream diversion, storage, import, export, return flow, or change in use caused by modifications in land use.

**unimpaired runoff** A representation of the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds.

**Urban Water Management Planning Act** Sections 10610 through 10657 of the California Water Code. The act requires urban water suppliers to prepare urban water management plans that describe and evaluate sources of water supplies, efficient uses of water, demand management measures, implementation strategies and schedules, and other relevant information and programs within their water service areas. Urban water suppliers (Section 10617) are either publicly or privately owned and provide water for municipal purposes, either directly or indirectly, to more than 3,000 customers or supply more than 3,000 acre-feet of water annually.

**urban water use** The use of water for urban purposes, including residential, commercial, industrial, recreation, energy production, military, and institutional classes. The term is applied in the sense that it is a kind of use rather than a place of use.

**urban water use efficiency** Methods or technologies resulting in the same beneficial residential, commercial, industrial, and institutional uses with less water or increased beneficial uses from existing water quantities.

## V

**vernal pools** A type of wetland that occurs in shallow foothill and valley depressions. Water remains in pools and swales until it evaporates, usually within a few days to a few months, mainly in late winter and spring.

**volatile organic compound (VOC)** A man-made organic compound that readily vaporizes in the atmosphere. These compounds are often highly mobile in the groundwater system and are generally associated with industrial activities.

## W

**wastewater** Domestic or municipal sewage or effluent from an industrial process.

**water demand** The desired quantity of water that would be used if the water were available and if a number of other factors, such as price, did not change. Demand is not static.

**water exchange** Typically, water delivered by one water user to another water user; the receiving water user will return the water at a specified time or when the conditions of the parties' agreement are met. (See also, water transfer.)



**water quality** Description of the chemical, physical, and biological characteristics of water, usually with regard to its suitability for a particular purpose or use.

**water quality objectives** Specific, legally enforced levels of water quality desired for identified uses including drinking, recreation, fish production or propagation of other aquatic life, agriculture, industry, and urban use.

**water recycling** The process of treating wastewater, rendering it suitable for beneficial use.

**water right** In water law, the right of a user to use water from a water source (e.g., a river, stream, pond, or source of groundwater).

**water service reliability** The degree to which a water service system can successfully manage water shortages.

**water supply exports** The amount of water that a region transfers to another to meet needs.

**water table** See groundwater table.

**water transfer** A temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer or exchange of water or water rights. A more general definition is that water transfers are a voluntary change in the way water is usually distributed among water users in response to water scarcity.

**water year** A continuous 12-month period for which hydrologic records are compiled and summarized. Different agencies may use different calendar periods for their water years. For DWR, a water year is October 1 through September 30.

**watershed** The land area from which water drains into a stream, river, or reservoir. Also called drainage area, drainage basin, or river basin.

**watershed management** The process of evaluating, planning, managing, restoring, and organizing land and other resource use within an area that has a single common drainage point.

**weir** (1) Any structure across a watercourse used to control, raise, or measure flows. (2) A barrier constructed to catch upstream migrating adult fish.

**wetlands** Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mud flats, and natural ponds. An area characterized by periodic inundation or saturation, certain types of soils, and vegetation adapted for life in saturated soil conditions.

**Wild and Scenic River systems** State and federally designated river systems under the 1968 national Wild and Scenic Rivers Act and the 1972 California Wild and Scenic Rivers Act. Seventeen rivers in California, including many forks and tributaries, are designated wild, scenic, or recreational.

**wheel** As applied to water and power, to provide the use of one agency's conveyance facilities for the purpose of transporting another agency's supply.

## X

**X2** Delta outflow interaction with tides determines the location of the X2 isohaline salinity gradient. X2 is the location in the Bay-Delta Estuary where the tidally averaged bottom salinity is 2 parts per thousand. It is expressed as the distance in kilometers from the Golden Gate Bridge. X2 is used as a primary indicator in managing Delta outflow.

## Z

**zooplankton** Small aquatic animals that are suspended or swimming in water.

**Appendix B**

**Data and Computations**

**Used to**

**Determine 2014 Water Charges**

Appendix B, Data and Computations Used to Determine 2014 Water Charges, was previously printed and distributed under an August 2013 cover letter from Robert Cooke, Chief of SWPAO, to State Water Project water contractors to document and support DWR's calculation of the contractors' annual charges. Appendix B appears on the following pages as it was published in August 2013. However, Table B-7 was not published in the August 2013 version of Appendix B because the data was not available at the time of publication. Table B-7 now appears in its entirety on page B-78.



**Appendix B  
Data and Computations  
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## Appendix B

### Data and Computations Used to Determine 2014 Water Charges

The Department of Water Resources (DWR) annually furnishes Statements of Charges to the 29 long-term State Water Project (SWP) water supply contractors. Article 29(e) of the Standard Provisions for Water Supply Contracts, approved August 3, 1962, describes those statements:

*All such statements shall be accompanied by the latest revised copies of the document amendatory to Article 22 and of Tables B, C, D, E, F, and G of this contract, together with such other data and computations used by the State in determining the amounts of the above charges as the State deems appropriate.*

To comply with Article 29(e), DWR performs an annual comprehensive review and redetermination of all water supply and financial aspects of the SWP for the entire project repayment period. This annual redetermination is performed in accordance with Article 22(f) and Article 28 of the water supply contracts, which concern the Delta Water Rate and annual transportation charges, respectively.

Appendix B includes data used to document the redetermination of water charges to be paid by contractors during calendar year 2014. The information is based on established data about the SWP, both known and projected, as of June 2013; however, small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If research requires more current data than was available at the time of production of

Bulletin 132, please contact the State Water Project Analysis Office. Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

The computational procedures and interrelationships between tabulations in this appendix are outlined on *Figures B-1 and B-2*. All tables referenced on *Figures B-1 and B-2* follow this text.

### Types of Water Charges

Charges to SWP water supply contractors include the costs of facilities for the conservation and development of a water supply and the conveyance of such supply to SWP service areas. These facilities are classified as "Project Conservation Facilities" and "Project Transportation Facilities" in the Standard Provisions for Water Supply Contract. Names of the main facilities in each classification follow.

#### Project Conservation Facilities

- Frenchman Dam and Lake
- Grizzly Valley Dam and Lake Davis
- Antelope Dam and Lake
- Oroville Dam and Lake Oroville
- Oroville power facilities
- Delta facilities
- A portion of the California Aqueduct from the Delta to Dos Amigos Pumping Plant
- Sisk Dam, San Luis Reservoir, and Gianelli Pumping-Generating Plant

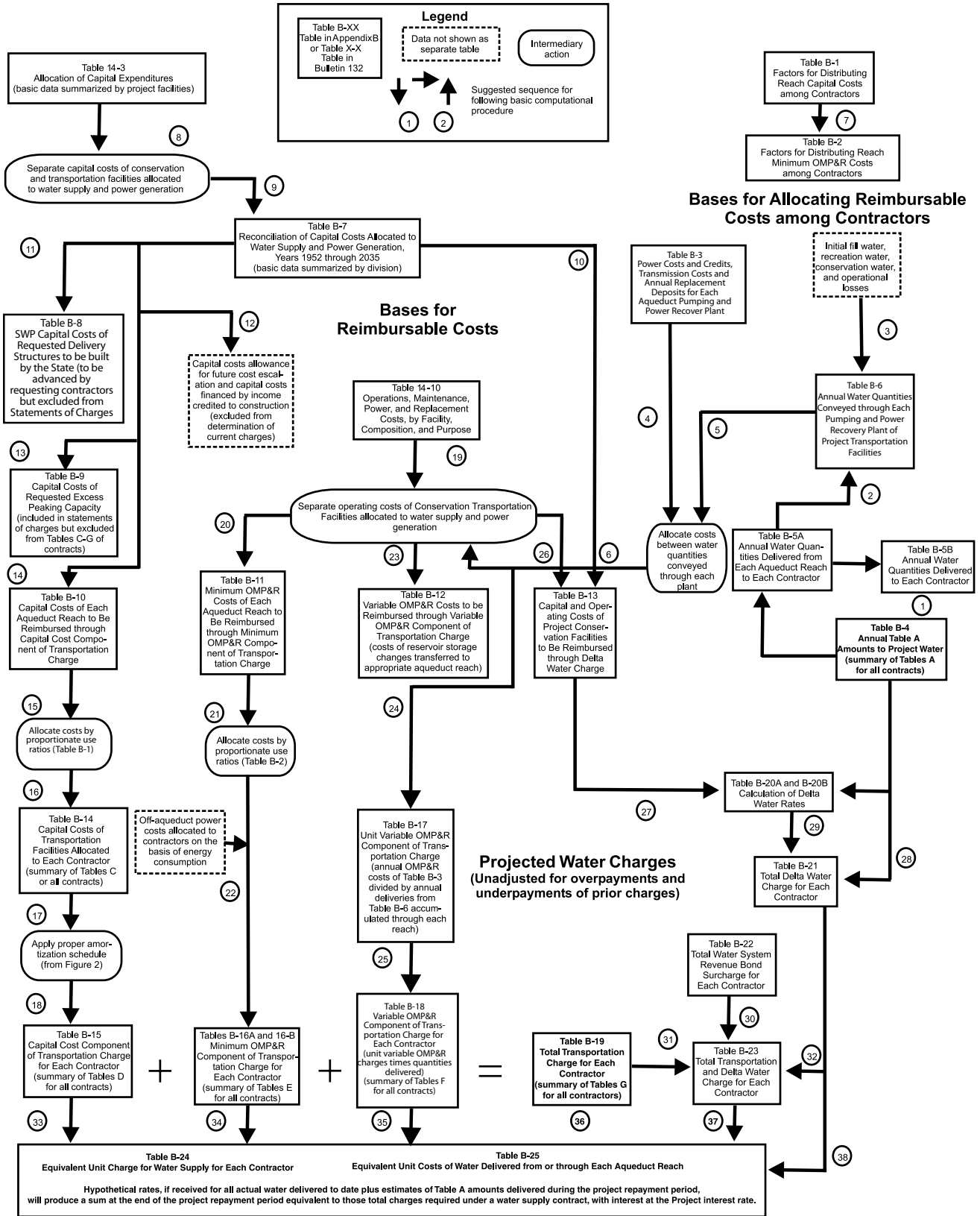
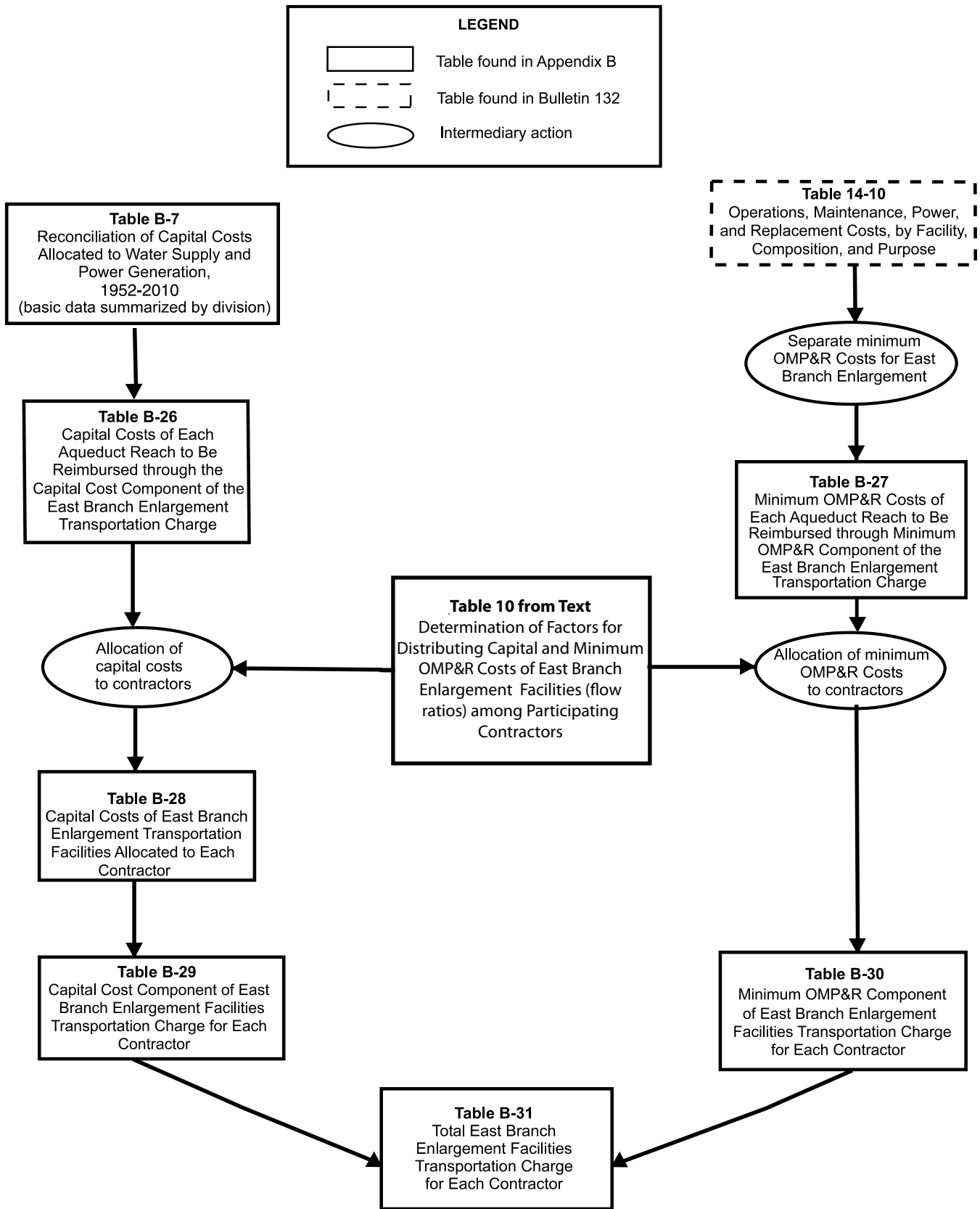


Figure B-1 Relationships of Data Used to Substantiate Statements of Charges





**Figure B-2 Relationships of Data Used to Substantiate East Branch Enlargement Charges**

## Project Transportation Facilities

- Grizzly Valley Pipeline
- North Bay Aqueduct
- South Bay Aqueduct, including Del Valle Dam and Lake del Valle
- The remainder of the California Aqueduct from the Delta to Dos Amigos Pumping Plant and all facilities south, including dams and lakes in Southern California
- Off-Aqueduct Power Facilities (Reid Gardner Unit No. 4, Bottlerock Powerplant, and South Geysers Powerplant)

The standard provisions provide for a Delta Water Charge and a Transportation Charge for project water.

The Delta Water Charge is a unit charge applied to each acre-foot of SWP water the contractors are to receive, in accordance with their contracts. The unit charge, if applied to each acre-foot of all such allocations for the remainder of the project repayment period, is calculated to result in repayment of all outstanding reimbursable costs of the Project Conservation Facilities, with appropriate interest, by the end of the repayment period (2035).

The Transportation Charge is for use of facilities to transport water to the vicinity of each contractor's turnout(s). Generally, the annual charge represents each contractor's proportionate share of the reimbursable capital costs and operating costs of the Project Transportation Facilities.

Each contractor's allocated share of those reimbursable capital costs is amortized for repayment to the State, and certain variations are allowed in the amortization methods. Contractors' shares of reimbursable operating costs are repaid in the year such costs are incurred by the State.

The East Branch Enlargement Transportation Charge is paid by the seven Southern California contractors participating in the enlargement. San Bernardino Valley Municipal Water District advanced funds to pay the district's allocated capital costs for the East Branch Enlargement. The remaining six contractors pay an allocated share of the debt service on revenue bonds sold to finance the enlargement. Each contractor also will pay an allocated share of the minimum operation, maintenance, power, and replacement (OMP&R) costs of the East Branch Enlargement.

Transportation charges for the Coastal Branch Extension, East Branch Extension, and South Bay Enlargement are being repaid by contractors in their respective service areas.

Transportation charges for the Tehachapi Afterbay are repaid by those contractors using electrical power for delivery of their Table A water downstream of the Tehachapi Afterbay.

## Composition and Timing of Water Charges

As shown on *Figure B-3*, the Delta Water Charge and the Transportation Charge consist of the following three components:

1. Conservation and transportation capital cost components, which will return to the State all reimbursable capital costs;
2. Conservation and transportation minimum OMP&R components, which will return to the State all reimbursable operating costs that do not depend on or vary with quantities of water actually delivered to the contractors; and

**Delta Water Charge***Capital Cost Component*

1. Planning, design, right-of-way, and construction costs of Conservation Facilities
2. Operations and maintenance costs for newly constructed Conservation Facilities prior to initial operations
3. Activation costs for newly constructed Conservation Facilities
4. Power costs allocated to initial filling of San Luis Reservoir
5. Capitalized O&M costs (major repair work and so forth) for Conservation Facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to SWP pumping prior to 1986  
(Department of Water Resources-Department of Fish and Game agreement)

*Minimum OMP&R Component*

1. Direct O&M costs of Conservation Facilities
  - a. Headquarters and field divisions (portion)
  - b. Insurance and FERC costs (portion)
2. General O&M costs allocated to Conservation Facilities
  - a. Contractor Accounting Office (portion)
  - b. Financial and contract administration (portion)
  - c. Water rights
  - d. Power planning for SWP facilities (portion)
3. Replacement deposits for SWP control centers (portion)
4. Credits for a portion of Hyatt-Thermalito power generation
5. Power costs and credits related to pumping water to San Luis Reservoir for project operations (storage changes)
6. Value of power used and generated by Gianelli Pumping-Generating Plant
7. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant  
(Department of Water Resources-Department of Fish and Game agreement)

**Transportation Charge***Capital Cost Component*

1. Planning, design, right-of-way, and construction costs of Transportation Facilities
2. O&M costs for newly constructed Transportation Facilities prior to initial operation
3. Activation costs for newly constructed Transportation Facilities
4. Power costs allocated to initial filling of Southern California reservoirs
5. Capitalized O&M costs (major repair work and so forth) for Transportation Facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to SWP pumping prior to 1986  
(Department of Water Resources-Department of Fish and Game agreement)

*Minimum OMP&R Component*

1. Direct O&M costs of Transportation Facilities
  - a. Headquarters and field divisions (portion)
  - b. Insurance and FERC costs (portion)
2. General O&M costs related to Transportation Facilities
  - a. Contractor Accounting Office (portion)
  - b. Financial and contract administration (portion)
  - c. Power planning for SWP facilities (portion)
3. Power costs and credits related to pumping water to Southern California reservoirs for project operations (storage changes)
4. Power costs for pumping water to replenish losses from Transportation Facilities
5. Other power costs
  - a. Station service at Transportation Facility power and pumping plants
  - b. Transmission service costs related to "backbone" Transportation Facilities
6. Replacement deposits for SWP control centers (portion)
7. Off-Aqueduct Power Facility costs—bond service, bond cover costs (25 percent of bond service), bond reserves, transmission costs to provide service to backbone," fuel costs taxes, and O&M-less power sales allocated to Off-Aqueduct Power Facilities
8. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant  
(Department of Water Resources-Department of Fish and Game agreement)

*Variable OMP&R Component*

1. Power purchase costs
  - a. Capacity
  - b. Energy
  - c. Pine Flat bond service, O&M, and transmission costs allocated to aqueduct pumping plants
2. Alamo, Devil Canyon, Warne, and Castaic power generation credited at the powerplant reach and charged to aqueduct pumping plants
3. Hyatt-Thermalito Diversion Dam powerplant generation charged to aqueduct pumping plants (credits for this generation are reflected in the Delta Water Rate)
4. Replacement deposits for equipment at pumping plants and powerplants
5. Credits from sale of excess SWP system power
6. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant  
(Department of Water Resources-Department of Fish and Game agreement)

Note: Excludes costs recovered under the East Branch Enlargement Transportation Charge.

**Figure B-3 Composition of Delta Water Charge and Transportation Charge**

3. A transportation variable OMP&R component, which will return to the State all reimbursable operating costs that depend on, and vary with, quantities of water actually delivered to the contractors.

The formula for computing the Delta Water Rate, Article 22(f) of the Standard Provisions for Water Supply Contract, was designed to ensure that all adjustments for prior overpayments or underpayments of the Delta Water Charge are accounted for in a redetermination of the rate. Since the redetermined rate applies to all future allocations, such adjustments are amortized during the remainder of the project repayment period. This appendix includes a redetermination of the Delta Water Rate for 2014.

Article 28 of the standard provisions stipulates that Transportation Charges be redetermined each year. The tables in Appendix B include the numerical data used in this redetermination. Transportation Charges for prior years through 2013, included in those tables are the redetermined amounts, and do not equal the amounts actually paid by contractors.

As provided under the Water System Revenue Bond Amendment to the water supply contracts, differences between actual payments under the Transportation capital cost component and amounts computed in this redetermination are accumulated with interest and amortized during the remaining years of the contract repayment period. All computations for adjustments are included in the attachments accompanying each contractor's Statement of Charges and are reflected in revised copies of Table C through Table G of the contract, which are also furnished to each long-term water supply contractor in the annual statements of charges.

These redeterminations exclude four charges associated with water service other than the Delta Water Charge and the Transportation Charge. The excluded charges (and the manner in which they are treated in this appendix) are outlined below.

1. Advances of funds pursuant to Article 24(d) of the standard provisions for excess capacity constructed by the State at the request of contractors.
2. Advances of funds pursuant to Article 10(d) of the standard provisions for delivery structures (turnouts) constructed by the State at the request of contractors. Partial information concerning actual and projected capital costs of such delivery structures is included in this appendix. Statements concerning these costs and data are furnished to the appropriate contractors at various times and are not part of the annual statements.
3. Payments for sale and service of surplus water to entities other than contractors, pursuant to Article 21 of the standard provisions, are also excluded. Those payments are generally based on the unit rates shown in Table B-25. Net revenues resulting from noncontractor service are applied as indicated on page 24 of Bulletin 132-71.
4. Payments under the Devil Canyon-Castaic contract for costs of the Devil Canyon-Castaic facilities allocable to power generation. Charges billed as a result of the contract are billed separately from those billed as a result of the water supply contract. Information about the treatment of such charges in relation to redetermined Transportation Charges is included in special attachments to the bills of the six participating contractors.

Time and method of payment for corresponding components of the Delta Water Charge and the Transportation Charge are as follows:

1. The capital cost components of the Delta Water Charge and the Transportation Charge are paid in two semiannual installments, due January 1 and July 1 of each year, based on statements furnished by the State on or before July 1 of the preceding year.
2. The minimum OMP&R components of the Delta Water Charge and the Transportation Charge are paid in 12 equal installments, due the first of each month and based on statements furnished by the State on or before July 1 of the preceding year.
3. The variable OMP&R component of the Transportation Charge is paid in varying monthly amounts and is due the fifteenth day of the second month following actual water delivery. The charges are projected based on a unit charge per acre-foot established on or before July 1 of the preceding year. Those unit charges may be revised during the year to reflect current power costs and revenues. The unit charges are applied to actual monthly delivery quantities as determined by the State on or before the fifteenth day of the month following actual water delivery.

## **Bases for Allocating Reimbursable Costs among Contractors**

This section describes procedures for allocating reimbursable costs of Project Transportation Facilities among contractors (see upper right portion of Figure B-1). Those costs do not include annual costs

of Off-Aqueduct Power Facilities, which are explained in the “Project Water Charges” section.

## **Capital and Minimum OMP&R Costs**

*Figure B-4* includes information about the repayment reaches that form the basis for allocating reimbursable costs of the Project Transportation Facilities among contractors.

Allocations of reimbursable capital costs and minimum OMP&R costs of each reach are based on the proportionate maximum use of that reach by respective contractors under planned conditions of full development.

The derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors was first reported in Bulletin 132-70. The ratios in Bulletin 132-70 were subsequently revised for the North Bay Aqueduct, the South Bay Aqueduct, the California Aqueduct from the Delta to Castaic Lake, and the Coastal Branch.

All the revisions reported in previous bulletins regarding the derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors were last reported in Tables B-1 and B-2 of Bulletin 132-91. Under Article 53 of the Monterey Amendment, agricultural contractors may sell up to 130,000 acre-feet of aqueduct capacity to municipal and industrial contractors. The first permanent transfer occurred in 1998. Currently, 114,000 acre-feet of the allowable capacity has been transferred. *Table 1* shows the permanent capacity transfers that have taken place since the Monterey Amendment was implemented in 1995.

*Table B-1* presents the reach ratios currently applicable to reimbursable capital costs.



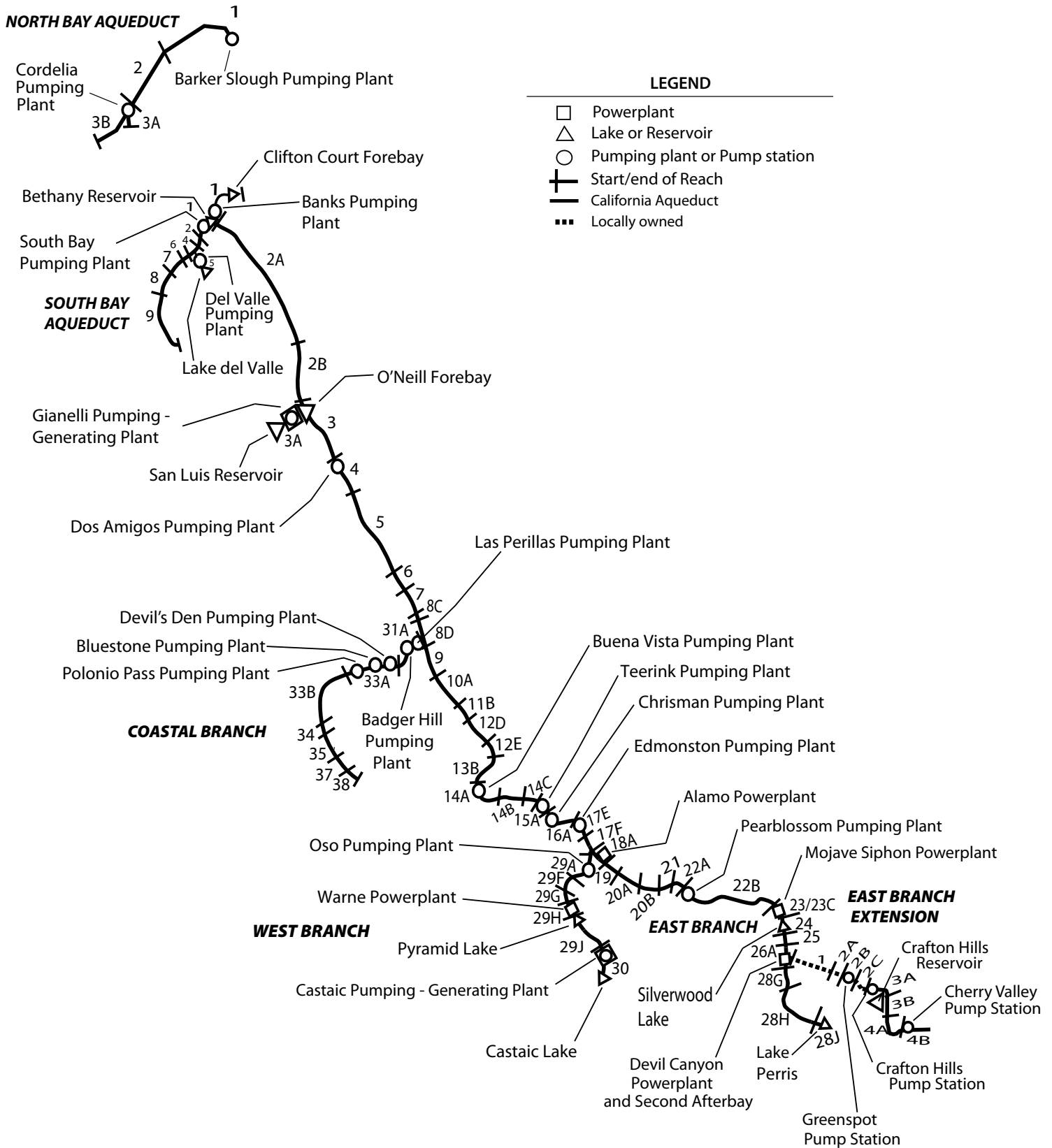


Figure B-4 Repayment Reaches and Descriptions

**North Bay Aqueduct**

- 1 Barker Slough through Fairfield /Vacaville Turnout
- 2 Fairfield/Vacaville Turnout to Cordelia Forebay
- 3A Cordelia Forebay through Benicia and Vallejo Turnouts
- 3B Cordelia Forebay through Napa Turnout Reservoir

**South Bay Aqueduct**

- 1 Bethany Reservoir through Altamont Turnout
- 2 Altamont Turnout through Patterson Reservoir
- 4 Patterson Reservoir to Del Valle Junction
- 5 Del Valle Junction through Lake del Valle
- 6 Del Valle Junction through South Livermore Turnout
- 7 South Livermore Turnout through Vallecitos Turnout
- 8 Vallecitos Turnout through Alameda-Bayside No.1 Turnout
- 9 Alameda-Bayside Turnout through Santa Clara Terminal Facilities

**California Aqueduct****North San Joaquin Division**

- 1 Delta through Bethany Reservoir
- 2A Bethany Reservoir to Orestimba Creek
- 2B Orestimba Creek to O'Neill Forebay

**San Luis Division**

- 3A Sisk Dam, San Luis Reservoir, Gianelli Pumping-Generating Plant
- 3 O'Neill Forebay to Dos Amigos Pumping Plant
- 4 Dos Amigos Pumping Plant to Panoche Creek
- 5 Panoche Creek to Five Points
- 6 Five Points to Arroyo Pasajero
- 7 Arroyo Pasajero to Kettleman City

**South San Joaquin Division**

- 8C Kettleman City through Milham Avenue
- 8D Milham Avenue through Avenal Gap
- 9 Avenal Gap through Twisselman Road
- 10A Twisselman Road through Lost Hills
- 11B Lost Hills to 7th Standard Road
- 12D 7th Standard Road through Elk Hills Road
- 12E Elk Hills Road through Tupman Road
- 13B Tupman Road to Buena Vista Pumping Plant
- 14A Buena Vista Pumping Plant through Santiago Creek
- 14B Santiago Creek through Old River Road
- 14C Old River Road to Teerink Pumping Plant
- 15A Teerink Pumping Plant to Chrisman Pumping Plant
- 16A Chrisman Pumping Plant to Edmonston Pumping Plant

**Coastal Branch, California Aqueduct**

- 31A Avenal Gap to Devil's Den Pumping Plant
- 33A Devil's Den Pumping Plant through Tank 1
- 33B Tank 1 through Chorro Valley Turnout
- 34 Chorro Valley Turnout through Lopez Turnout
- 35 Lopez Turnout through Guadalupe Turnout
- 37 Guadalupe Turnout to SPRR crossing near Casmalia
- 38 SPRR crossing near Casmalia through terminous at Tank 5 (Outlet Vault)

**Tehachapi Division**

- 17E Edmonston Pumping Plant to Porter Tunnel
- 17F Porter Tunnel to Junction, West Branch

**Mojave Division**

- 18A Junction, West Branch through Alamo Powerplant
- 19 Alamo Powerplant to Fairmont
- 19C Buttes Junction through Buttes Reservoir
- 20A Fairmont through 70th Street West
- 20B 70th Street West to Palmdale
- 21 Palmdale to Littlerock Creek
- 22A Littlerock Creek to Pearblossom Pumping Plant
- 22B Pearblossom Pumping Plant to West Fork Mojave River
- 23 West Fork Mojave River to Silverwood Lake
- 23C Mojave Siphon Powerplant
- 24 Cedar Springs Dam and Silverwood Lake

**Santa Ana Division**

- 25 Silverwood Lake to South Portal, San Bernardino Tunnel
- 26A South Portals San Bernardino Tunnel through Devil Canyon Powerplant and Second Afterbay
- 28G Devil Canyon Powerplant and Second Afterbay to Barton Road
- 28H Barton Road to Lake Perris
- 28J Perris Dam and Lake Perris

**East Branch Extension**

- 1 Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road
- 2A Junction, Foothill Pipeline near Cone Camp Road to Greenspot Pump Station
- 2B Greenspot Pump Station to Morton Canyon Valve Vault
- 2C Morton Canyon Valve Vault to Crafton Hills Pump Station
- 3A Crafton Hills Pump Station to Carter Street Valve Vault
- 3B Carter Street Valve Vault to Garden Air Creek, South of San Bernardino/Riverside County Line
- 4A Garden Air Creek to Cherry Valley Pump Station
- 4B Cherry Valley Pump Station to Terminus at Noble Creek

**West Branch, California Aqueduct**

- 29A Junction, California Aqueduct through Oso Pumping Plant
- 29F Oso Pumping Plant through Quail Embankment
- 29G Quail Embankment through Warne Powerplant
- 29H Pyramid Dam and Lake
- 29J Pyramid Lake through Castaic Powerplant
- 30 Castaic Dam and Lake

*Table B-2* presents corresponding ratios for allocating 2014 and after reimbursable minimum OMP&R costs among contractors. Requested excess capacity is omitted when deriving ratios applicable to capital costs because the capital costs for the excess capacity are paid on an incremental-cost basis and not a proportionate-use basis. However, requested excess capacity is accounted for in the ratios applicable to minimum OMP&R costs.

### Variable OMP&R Costs

Article 26(a) includes provisions to ensure that the variable OMP&R component of the Transportation Charge will result in a return to the State of those costs that depend on and vary with the amount of SWP water deliveries. (The minimum OMP&R component results in a return of those operating costs that do not vary with deliveries.) Under Article 26(a) all such costs for a reach for a given year will be allocated among contractors in proportion to the actual annual use of that reach by the respective contractors.

*Table B-3* summarizes the total power costs, credits, and transmission costs for each aqueduct pumping and power recovery plant. Variable costs are the following:

- Costs of capacity and energy used exclusive of associated power transmission and station service charges (transmission and station service costs that are independent and vary with power usage are classified as minimum OMP&R costs).
- Credits for capacity and energy produced at aqueduct power recovery plants (treated as negative costs).
- Payments for replacement of major plant machinery components having economic lives shorter than the project repayment period. (In 1997, DWR discontinued charging for a sinking fund

for replacements. Replacement costs, for 1999 and thereafter, are to be paid on an annual basis as the costs are incurred.)

- Beginning in 2005, a portion of transmission expenditures that will depend on and vary with water and power usage. These costs will be included as part of the variable component.

*Table B-3* excludes plant capacity and energy costs associated with surplus and unscheduled water service after May 1, 1973. Prior to that date, surplus water service was charged the same unit variable OMP&R component as allocated water service. An amendment to the long-term water supply contracts in 1973 significantly changed the rate structure for surplus water service. Capacity and energy costs for pumping surplus and unscheduled water were allocated directly to those water contractors receiving surplus and unscheduled water service. A contract amendment in 1991 again revised the rate structure to provide for payment of costs through a melded power rate. These revisions to charges for surplus and unscheduled water are effective from the date of the amendments and are not applied to past charges.

An interruptible water program was established in 1994. This program, later renamed to Article 21 program, is based on individual annual contracts; costs for Article 21 water actually delivered are included in *Table B-3*.

### Water Conveyance

*Tables B-4, B-5A, B-5A-Adj, B-5B, and B-6* present water conveyance quantities that form the basis for allocating costs.

*Table B-4* presents the schedules of annual allocations as set forth in Table A and Article 6(a) of each water supply contract.

**Table 1 Summary of Permanent Aqueduct Capacity Transfers**

Contractor		Capacity Transfer		
Seller	Buyer	Amount (af)	Effective Year	Transfer Description
<b>Transfers under Monterey Amendment</b>				
Kern	Mojave	25,000	1998	Purchased capacity upstream from Reach 31A
Kern	Castaic Lake	41,000	2000	Purchased capacity upstream from Reach 16A
Kern	Palmdale	4,000	2000	Purchased capacity upstream from Reach 11B
Kern	Alameda-Zone 7	7,000	2000	Purchased capacity upstream from Reach 10A
Kern	Alameda-Zone 7	15,000	2000	Purchased capacity upstream from Reach 10A
Kern	Alameda-Zone 7	10,000	2001	Purchased capacity upstream from Reach 11B
Kern	Solano	5,756	2001	Purchased capacity upstream from Reach 11B and Reach 31A
Kern	Napa	4,025	2001	Purchased capacity upstream from Reach 11B and Reach 31A
Kern	Alameda-Zone 7	2,219	2004	Purchased capacity upstream from Reach 11B
<i>Subtotal under Article 53</i>		<i>114,000</i>		
<b>Transfers outside of Monterey Amendment</b>				
Tulare	Dudley Ridge	3,973	2002	Purchased capacity upstream from Reach 8D
Tulare	AVEK	3,000	2002	Purchased capacity upstream from Reach 8D
Tulare	Alameda-Zone 7	400	2003	Purchased capacity upstream from Reach 8D
Tulare	Kings	5,000	2004	Purchased capacity upstream from Reach 8D
Tulare	Coachella	9,900	2004	Purchased capacity upstream from Reach 8D
MWDSC	Coachella	88,100	2005	Purchased capacity upstream from Reach 28J
MWDSC	Desert	11,900	2005	Purchased capacity upstream from Reach 28J
Tulare	Kings	305	2006	Purchased capacity upstream from Reach 31A
Tulare	Desert	1,750	2010	Purchased capacity upstream from Reach 17F
Tulare	Coachella	5,250	2010	Purchased capacity upstream from Reach 17F
Kern	Desert	4,000	2010	Purchased capacity upstream from Reach 17F and Reach 31A
Kern	Coachella	12,000	2010	Purchased capacity upstream from Reach 17F and Reach 31A
Dudley Ridge	Mojave	7,000	2010	Purchased capacity upstream from Reach 8D
Dudley Ridge	Avek	1,993	2014	Purchased capacity upstream from Reach 8D
Tulare	Avek	1,451	2014	Purchased capacity upstream from Reach 8D
<i>Subtotal outside of Article 53</i>		<i>156,022</i>		

Table B-5A shows amounts of actual and projected allocated water quantities delivered from each aqueduct reach to each contractor. Projected deliveries for years 2013 through 2035 are based on contractors' requests for future water deliveries. The quantities included in Table B-5A also include nonproject water delivered to contractors and surplus water deliveries prior to May 1, 1973, and actual Article 21 water deliveries in 1994 and after.

Table B-5A-Adj presents a summary of accounting adjustments that result from water deliveries not originating from the Sacramento-San Joaquin Delta. The methodologies used to calculate various components are based on cumulative charges from the Delta through facilities conveying water to a specific repayment reach. When water is introduced to the SWP downstream of the Delta, contractors require an adjustment, or credit, for those facilities not used to convey the water.

Table B-5B presents a summary of actual and projected annual allocated water quantities for each contractor. The quantities also include amounts of nonproject water and surplus water delivered prior to May 1, 1973, and actual deliveries of Article 21 water in 1994 and after.

Table B-6 summarizes the annual allocated water quantities conveyed or to be conveyed through each aqueduct pumping plant or power plant for each of the following functions:

- *Deliveries-Water Supply.* Water made available to contractors at down-aqueduct delivery structures, including certain hypothetical quantities to facilitate cost allocations, for those years when deliveries are made from net annual storage withdrawals. The net annual amounts of storage withdrawals are hypothetically added to the actual amounts conveyed from the Delta to the reservoirs, since deliveries made from storage withdrawals bear the same variable OMP&R costs per acre-foot as they would if the deliveries were actually conveyed from the Delta in that year. The hypothetical increases in the deliveries made from reservoir storage withdrawals are offset by equal credits to the minimum OMP&R costs of the respective reservoirs. Thus, the variable OMP&R components per acre-foot (Table B-17) may be applied to the total annual quantities delivered either from aqueduct reservoir storage or from the Delta.
- *Initial Fill Water.* Water required for initial filling of down-aqueduct reaches and reservoirs or for repayment of pre-consolidation water used during construction.
- *Deliveries-Recreation.* Water delivered to down-aqueduct recreation developments or used for fish and wildlife enhancement.

- *Operational Losses.* Water lost through evaporation and seepage from all down-aqueduct reaches.
- *Reservoir Storage Changes.* Water placed in down-aqueduct reservoir storage after initial filling of the reservoirs, including projected net annual storage accretions (positive values) and withdrawals (negative values) for all down-aqueduct reservoirs of the Project Transportation Facilities.

Variable OMP&R costs (Table B-12) that are allocable to storage accretions are assigned to the minimum OMP&R costs of the respective reservoirs. With the exception of Banks Pumping Plant, "Reservoir Storage Changes" also includes SWP water placed into Southern California groundwater storage from 1978 through 1982 (as positive amounts); and water withdrawn from storage and delivered to contractors in 1979, 1982, 1987, 1988, and 1989 (as negative amounts). At Banks Pumping Plant, groundwater additions and withdrawals are included in "Conservation Water."

Table B-6 also summarizes the following two amounts under the heading "Conservation Water" (Column 25):

1. Net annual water amounts stored and projected to be stored in San Luis Reservoir.
2. Water lost and projected to be lost through evaporation and seepage from San Luis Reservoir and from the water conservation portion of the California Aqueduct.

"Conservation Water" includes initial fill water, operational losses, and net annual storage changes associated with San Luis Reservoir and the portion of the California Aqueduct that is allocated to conservation. The same allocation procedure outlined



previously for Transportation Facilities also applies to water delivered from storage in Conservation Facilities, except that the hypothetical cost increases are added to the variable OMP&R cost to be reimbursed through the Transportation Charge and deducted from the minimum OMP&R costs to be reimbursed through the Delta Water Charge.

San Luis Reservoir is operated to conserve water for future delivery to downstream contractors. To account for costs associated with reservoir storage, the power and replacement costs of Banks Pumping Plant (a joint Transportation-Conservation Facility) that are allocated to the conveyance of annual conservation water quantities are transferred to the capital costs of San Luis Reservoir (during initial fill) or to the minimum OMP&R costs of San Luis Reservoir (following initial fill).

In years of net storage withdrawal from San Luis Reservoir, a portion of the minimum OMP&R cost of the reservoir is transferred to the variable OMP&R cost of Banks Pumping Plant. That transfer is equal to the variable OMP&R cost per acre-foot of delivery through Banks Pumping Plant for that year, multiplied by the acre-feet of deliveries derived from San Luis Reservoir storage for that year. *Table B-6* also includes amounts of nonproject water and surplus water delivered prior to May 1, 1973, and actual deliveries of Article 21 water in 1994 and thereafter.

## Bases for Reimbursable Costs

This section describes the methods used to derive the costs allocated by the procedures outlined in the preceding section. A diagram of the cost derivation process is shown in the upper-left quadrant of Figure B-1.

First, the capital and minimum OMP&R costs of all SWP facilities are allocated among the various project purposes in accordance with the allocation percentages in *Table 2*. Those percentages may be subject to revision in the future.

The redeterminations in this appendix involve only the SWP costs that are allocated to water supply and power generation.

## Capital Costs

Capital costs used in the redeterminations in this appendix reflect prices prevailing on December 31, 2012; future cost escalation will be reflected in subsequent bulletins.

*Table B-7* presents a reconciliation of estimated total capital costs of each Project Conservation Facility and each Project Transportation Facility. This table shows the relationship of Project Conservation and Transportation costs allocated to contractors (*Tables B-8, B-9, B-10 and B-13*) to the total SWP capital costs projected by DWR.

*Table B-8* shows costs incurred and projected to be incurred by the State in connection with each contractor's turnouts. Costs incurred by the State for both State-constructed and contractor-constructed delivery structures are paid directly by the contractors for which the structures are built. The State incurs design review and construction inspection costs in connection with contractor-constructed turnouts.

*Table B-9* lists costs and payments for excess capacity built into SWP Transportation Facilities in accordance with amendments to contracts with Metropolitan Water District of Southern California (Metropolitan), San Gabriel Valley Municipal Water District, and Antelope Valley-East Kern Water Agency, including the following:

**Table 2 Project Purpose Cost Allocation Factors (Percentages)**

PROJECT FACILITIES	Water Supply and Power Generation		All Other Purposes (Nonreimbursable)	
	Capital Costs	Minimum OMP&R Costs	Capital Costs	Minimum OMP&R Costs
<b>Project Conservation Facilities</b>				
Frenchman Dam and Lake	21.5	0.0	78.5	100.0
Antelope Dam and Lake	0.0	0.0	100.0	100.0
Grizzly Valley Dam and Lake Davis	1.0	1.8	99.0	98.2
Oroville Division <sup>(a)</sup>	97.1	99.5	2.9	0.5
California Aqueduct, Delta to Dos Amigos Pumping Plant	96.6	96.7	3.4	3.3
Delta Facilities				
Peripheral Canal Related	86.0	86.0	14.0	14.0
Remaining of Delta Facilities	96.6	96.7	3.4	3.3
<b>Transportation Facilities</b>				
Grizzly Valley Pipeline	100.0	100.0	0.0	0.0
North Bay Aqueduct	100.0	100.0	0.0	0.0
South Bay Aqueduct				
Del Valle Dam and Lake del Valle	25.2	22.0	74.8 <sup>(b)</sup>	78.0 <sup>(c)</sup>
Remainder of South Bay Aqueduct	100.0	100.0	0.0	0.0
California Aqueduct				
Delta to Dos Amigos Pumping Plant	96.6	96.7	3.4	3.3
Dos Amigos Pumping Plant to termini (excluding Coastal Branch) <sup>(d/e)</sup>	94.3 / 99.6	96.9 / 99.6	5.7 / 0.4	3.1 / 0.4
Aqueduct and Plants <sup>(d/e)</sup>	94.3 / 99.6	96.9 / 99.6	5.7 / 0.4	3.1 / 0.4
Pyramid Dam and Lake <sup>(d/e)</sup>	94.3 / 96.1	96.9 / 96.1	5.7 / 3.9	3.1 / 3.9
Castaic Dam and Lake <sup>(d/e)</sup>	94.3 / 91.1	96.9 / 91.1	5.7 / 8.9	3.1 / 8.9
Silverwood Dam and Lake <sup>(d/e)</sup>	94.3 / 85.3	96.9 / 85.3	5.7 / 14.7	3.1 / 14.7
Perris Dam and Lake <sup>(d/e)</sup>	94.3 / 67.7	96.9 / 67.7	5.7 / 32.3	3.1 / 32.3
Coastal Branch	100.0	100.0	0.0	0.0

<sup>(a)</sup>Percentages indicated are applicable to the remaining costs of division after excluding costs allocated to flood control that are reimbursed by the federal government (22 percent of capital costs) and excluding specific power costs of Hyatt and Thermalito Powerplants and switchyards.

<sup>(b)</sup>Percentage indicated consists of 48.0 percent of costs allocated to recreation and 26.8 percent to flood control.

<sup>(c)</sup>Percentage indicated consists of 44.9 percent of costs allocated to recreation and 33.1 percent to flood control.

<sup>(d)</sup>Percentage indicated is used for 2013 and previous years.

<sup>(e)</sup>Percentage indicated is used for 2014 and forward.

- Additional costs incurred by the State for requested excess capacity;
- Advances by water contractors of funds for such costs; and
- Credits for advances in excess of costs, which were applied to respective contractors' installments of the capital cost component of the Transportation Charge in 1981.

Under Amendment 2 of Metropolitan's contract, 809 cubic feet per second of excess capacity was originally constructed in reaches of the West Branch at Metropolitan's request. That capacity was reclassified as basic capacity of SWP Transportation Facilities under Amendment 7. Metropolitan paid \$16.3 million as a prepayment of the capital cost component of the Transportation Charge in lieu of advancing funds for the original requested capacity.

Amendment 5 to Metropolitan's contract requires that additional costs for modifications to the Santa Ana Pipeline (required for enlargement of Lake Perris) will be allocated to Metropolitan and returned to the State through payments of the Transportation Charge. The additional costs to be repaid through Metropolitan's capital cost component for the aqueduct reach from Devil Canyon Powerplant to Barton Road total about \$6.7 million (see Bulletin 132-72, page 98).

*Table B-10* presents the actual and projected annual capital costs of each aqueduct reach that will eventually be returned to the State, with interest, through contractors' payments of the capital cost component of the Transportation Charge and payment of debt service under the Devil Canyon-Castaic contracts.

### Annual Operating Costs

Annual operating costs allocable to water supply and power generation are returned to the State through the minimum OMP&R components of the Delta Water Charge and the Transportation Charge and through a portion of the revenues from energy sales. All reimbursable operating costs of Conservation Facilities are included in the minimum OMP&R component of the Delta Water Charge.

### Transportation and Devil Canyon-Castaic Contract Costs

*Table B-11* shows the amounts of the actual and projected costs to be reimbursed through payments of the minimum OMP&R component of the Transportation Charge and allocated operating costs under the Devil Canyon-Castaic contract. The table includes the following seven types of operating costs incurred annually that do not vary with water quantities delivered to the contractors:

1. All direct labor charges for field operation and maintenance personnel, including associated indirect costs;
2. A distributed share of general operating costs that cannot be identified solely with one facility or aqueduct reach;
3. All of electric power transmission and station service costs up to 2004, and electric power transmission and station service costs for 2005 and after that do not vary with power usage allocable to aqueduct pumping and recovery plants;
4. All costs for equipment, materials, and supplies;
5. Portions of the power and replacement costs of all up-aqueduct pumping plants and power plants that are allocable to the annual conveyance of water lost to evaporation and seepage from respective aqueduct reaches or placed into storage in respective reservoirs of the project transportation facilities (after initial fill);
6. Credits, which offset those costs in (5) above, for deliveries drawn from reservoir storage; and
7. Escalation of projected operating costs at 2.5 percent per year for 2014 and 2015, and escalation of projected operating costs at 1 percent per year for 2016-2035.

*Table B-12* shows the portions of variable OMP&R costs in *Table B-3* that are allocable to the water supply delivery quantities included in *Table B-6* and reimbursed through payments of the variable OMP&R component of the Transportation Charge.

To derive *Table B-12* costs, the following adjustments are made to *Table B-3* costs:

1. Part of the variable OMP&R costs of each plant is allocated to recreation. The allocation to

recreation is in proportion to the quantity of water conveyed through each plant each year for delivery to on-shore recreational developments. That portion of variable plant costs attributable to the initial fill of aqueduct reaches is allocated to the joint capital costs of respective down-aqueduct reaches and reservoirs.

2. That portion of costs attributable to evaporation and seepage is allocated to the joint minimum OMP&R costs of respective down-aqueduct reaches and reservoirs.
3. Adjustments are made for additions or withdrawals from storage in aqueduct reservoirs. In years when water is added to storage in aqueduct reservoirs, the cost of conveying this water into storage is charged to the minimum OMP&R costs of the corresponding reservoir. In years when storage in aqueduct reservoirs is decreased for the purpose of making deliveries, a credit is applied to the minimum OMP&R costs of the reservoir from which the storage is released. This credit is equal to the number of acre-feet of storage reduction times the variable OMP&R unit rate for the year the storage is released. The unit rate is equal to the variable OMP&R unit rate for the year the water is taken from storage.
4. That portion of costs attributable to pumping water to replace evaporation and seepage losses and for additions or withdrawals from storage in San Luis Reservoir is charged to the minimum OMP&R component of the Delta Water Rate.

The remaining costs are allocated to transportation water supply and repaid by the contractors.

## Conservation Capital and Operating Costs

*Table B-13* is a summary of actual and projected capital and operating costs of the initial Project Conservation Facilities. These costs are reimbursed through payments by contractors under the Delta Water Charge, Oroville power sales, and Gianelli Generating Plant credits. *Table B-13* also shows credits applied to the reimbursable capital costs of the Project Conservation Facilities in accordance with negotiated settlements concerning incurred planning costs for the period from 1952 through 1978.

## Project Water Charges

This section describes the redetermination of past and projected components of the Transportation Charge for annual revision of Tables C through G of each water supply contract. This section also describes the derivation of the unit Delta Water Rates and the Water System Revenue Bond Surcharge.

A summary of equivalent unit charges for each acre-foot of allocated water service is also included for each contractor and each aqueduct reach. A diagram of all calculations may be found on the lower half of Figure B-1.

## Transportation Charges

The accumulation of allocated costs of each aqueduct reach to each contractor is the basis for the Transportation Charge components.

*Table B-14* summarizes each contractor's share of the capital costs of the aqueduct reaches presented in *Table B-10*. Those amounts are determined by applying proportionate-use ratios set forth in *Table B-1* to the costs in *Table B-10*. The resulting allocated costs are set forth in *Table C* of the respective water supply contracts.

Prepayments of the capital cost component, required under Metropolitan's Amendment 7, are included as negative capital costs in Table B-14 and Table C of Metropolitan's Statement of Charges. Solano, Empire-West Side Irrigation District, and Castaic Lake Water Agency also prepaid capital costs (see Table B-14 footnotes). Table B-14 includes costs of the East Branch Extension to provide water service to San Bernardino Valley Municipal Water District and San Geronio Pass Water Agency.

Both Table B-14 and Table C of the six contractors for project water service below Devil Canyon Powerplant and Castaic Powerplant include the capital costs reimbursable under the Devil Canyon-Castaic contract.

*Table B-15* summarizes capital cost components of the Transportation Charge for each contractor for each year of the project repayment period. By the year 2035, the capital cost components shown in Table B-15 will recover the costs shown in Table B-14, with interest at the Project Interest Rate of 4.610 percent per annum and based on the amortization schedules included in *Table 3*.

Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in Table D of the water supply contracts. Costs of excess capacity are billed separately and are not included in Table B-15.

Table B-15 includes the debt service payments due from the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant, in accordance with terms of the Devil Canyon-Castaic contract.

Table B-16A summarizes the minimum OMP&R components of the Transportation Charge for each year of the project repayment period. Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in Table E of the respective contracts.

The total amounts included in Table B-16A are determined by applying the proportionate-use ratios in Table B-2 to the reach costs in Table B-11.

Table B-16A excludes Off-Aqueduct Power Facility charges, which are included separately in *Table B-16B*. Both Table B-16A and Table E include the operating costs payable under the Devil Canyon-Castaic contract for the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant.

As part of operating agreements with DWR, Kern was billed from 1963 through 1987 for any additional operating costs caused by early installation of units in Las Perillas and Badger Hill Pumping Plants by Berrenda Mesa Water Storage District (see Bulletin 132-71, page 7). Under those agreements, a portion of minimum OMP&R costs of Reach 31A were assigned directly to Kern, as shown in *Table 4*, with the remaining reach costs allocated by application of the proportionate-use ratios. DWR purchased the last unit, Unit No. 6, at Las Perillas and Badger Hill Pumping Plants in early 1997 to provide pumping capacity for deliveries to Coastal Area contractors, which began in 1997.



**Table 3 Criteria for Amortizing Capital Costs of Transportation Facilities**

Contractor	Year of Initial Payment <sup>(a)</sup>
Alameda County Flood Control and Water Conservation District – Zone 7	1963 <sup>(b)</sup>
Alameda County Water District	1963
Antelope Valley—East Kern Water Agency	1963
Castaic Lake Water Agency	1964
City Yuba City	<sup>(c)</sup>
Coachella Valley Water District	1964
County of Butte	<sup>(c)</sup>
County of Kings	1968
Crestline-Lake Arrowhead Water Agency	1964
Desert Water Agency	1963 <sup>(d)</sup>
Dudley Ridge Water District	1968 <sup>(e)</sup>
Kern County Water Agency	
Agricultural Use	1968 <sup>(e)</sup>
Municipal and Industrial Use	1968 <sup>(e)</sup>
Littlerock Creek Irrigation District	1964
Metropolitan Water District of Southern California	1963
Mojave Water Agency	1964
Napa County Flood Control and Water Conservation District	1966
Oak Flat Water District	1968
Palmdale Water District	1964
Plumas County Flood Control and Water Conservation District	1970
San Bernardino Valley Municipal Water District	1963
San Gabriel Valley Municipal Water District	1963 <sup>(d)</sup>
San Geronio Pass Water Agency	1963 <sup>(d)</sup>
San Luis Obispo County Flood Control and Water Conservation District	1964 <sup>(f)</sup>
Santa Barbara County Flood Control and Water Conservation District	1964
Santa Clara Valley Water District	1963
Solano County Water Agency	1973
Tulare Lake Basin Water Storage District	1968 <sup>(e)</sup>
Ventura County Watershed Protection District	1964

<sup>(a)</sup> Allocated capital costs of transportation facilities amortized in equal annual installments unless otherwise noted.

<sup>(b)</sup> Principal payments on each annual capital cost prior to 1971 delayed until calendar year 1972, except payments for 1963.

<sup>(c)</sup> For Yuba City and Butte County payments for Delta Water Charge only.

<sup>(d)</sup> Payment deferred for 1963 and added to 1964 payment with accrued interest.

<sup>(e)</sup> For Dudley Ridge, Empire, Kern (agricultural use), Oak Flat, and Tulare, according to Article 45 of the contracts for supply of agricultural water, capital costs of transportation facilities allocated to agricultural water supply are amortized by using an equivalent unit rate per acre-foot applied to the annual allocations (Table B-4) through the project repayment period.

<sup>(f)</sup> For San Luis Obispo and Santa Barbara County, all principal and interest payments for costs of the Coastal Stub were deferred until 1976.

**Table 4 Minimum OMP&R Costs of Reach 31A Assigned Directly to Kern County Water Agency**

Year	Direct Charges
1969	46,511
1970	46,302
1971	140,074
1972	95,017
1973	72,454
1974	100,692
1975	127,456
1976	138,504
1977	120,753
1978	157,652
1979	121,231
1980	150,728
1981	75,866
1982	82,805
1983	90,007
1984	107,468
1985	159,406
1986	137,241
1987	127,073
1988	130,924
1989	128,468
1990	138,234
1991	139,527
1992	185,370
1993	219,334
1994	364,196
1995	272,341
1996	322,123
<b>Total</b>	<b>3,997,767</b>

As a result of the Monterey Amendment, the costs related to this settlement are to be allocated among all SWP contractors in proportion to their maximum Table A amounts. As costs are incurred, related charges will be included in the contractors' annual Statements of Charges as part of the minimum. Between 2002 and 2010, the Monterey Amendment litigation costs recovered from the SWP Contractors were \$15.8 million.

*Table B16-B* summarizes annual Off-Aqueduct Power Facility charges allocated to each water contractor, adjusted for prior overpayments or underpayments. Those charges are to repay all Off-Aqueduct Power costs, including bond service, deposits for reserves, operation and maintenance costs, fuel costs, taxes, and insurance.

Adopted October 1, 1979, the General Bond Resolution requires that sufficient revenues be collected each year to repay all of those costs. In addition, an amount totaling 25 percent of the annual bond service is collected each year to ensure that sufficient funds are available to cover all annual costs. Any revenues collected and not needed during the year are refunded to the contractors in the next year.

*Table 5* summarizes Off-Aqueduct Power Facility charges and credits related to deliveries for 2012. The Reid Gardner Powerplant Separation costs are tracked independently from annual Reid Gardner operating costs in anticipation of the Reid Gardner Powerplant contract expiration in 2013.

**Table 5 Summary of 2012 Off-Aqueduct Power Facility Charges and Credits**

Charges by Item	(Dollars)
Reid Gardner Powerplant	116,735,107
Reid Gardner Separation Costs	2,171,991
Bottle Rock Powerplant	11,830,503
South Geysers Powerplant	5,503,281
<i>Subtotal</i>	<i>136,240,882</i>
<b>Credits by Item</b>	
Power Sales	(1,697,590)
<b>Net Total Charge</b>	<b>134,543,292</b>

*Table 6* shows projected Off-Aqueduct Power Facility charges and an amount equal to 25 percent of annual bond service for 2013 through 2035.

Annual Off-Aqueduct Power Facility charges are allocated among contractors in proportion to the electrical energy required to pump allocated water for the year. The initial allocation for the Statements of Charges is based on estimates of energy to pump requested allocated water deliveries, based on a 60-percent allocation.

An interim adjustment in the allocation of Off-Aqueduct Power costs may be made in May of each year, based on updated cost estimates and April revisions in water delivery schedules. An additional adjustment is made the following year based on actual water deliveries and actual costs for the year.

**Table 6 Projected Charges for Off-Aqueduct Power Facilities**

Year	Total Annual Cost (Dollars)	25% Bond Cover (Dollars)
2013	84,581,088	7,105,543
<b>2014</b>	<b>44,723,694</b>	<b>3,940,739</b>
2015	14,662,651	2,307,581
2016	9,917,696	1,978,590
2017	9,728,690	1,940,789
2018	3,914,799	778,011
2019	3,905,256	776,102
2020	4,239,144	842,880
2021	6,193,301	1,233,711
2022	5,865,991	1,168,249
2023	4,304,706	855,992
2024	3,218,876	638,826
2025	526,990	100,449
2026	660,980	127,247
2027	983,864	191,824
2028	682,671	131,585
2029	679,508	130,953
2030	203,730	35,797
2031	203,261	35,703
2032	208,542	36,759
2033	206,917	36,434
2034	204,964	36,044
2035	208,933	36,838

The energy required to pump each contractor’s water is calculated using the kilowatt-hour per acre-foot factors shown in *Table 7* for the pumping plants upstream from the delivery turnouts. The amounts shown include transmission losses.

**Table 7 Kilowatt-Hour per Acre-Foot Factors for Allocating Off-Aqueduct Power Facility Costs**

Pumping Plant	kWh per acre-foot <sup>(a)</sup>	
	At Plant	Cumulative from Delta
Barker Slough	223	223
Cordelia-Benicia	434	657
Cordelia-Vallejo	178	401
Cordelia-Napa	563	786
Harvey O. Banks (Delta)	296	296
South Bay (including Del Valle)	869	1,165
Dos Amigos	138	434
Buena Vista	242	676
Teerink	295	971
Chrisman	639	1,610
Edmonston	2,236	3,846
Pearblossom	703	4,549
Greenspot	871	5,420
Crafton Hills	1,087	6,507
Cherry Valley	224	6,731
Oso	280	4,126
Las Perillas	77	511
Badger Hill	200	711
Devil’s Den	705	1,416
Bluestone	705	2,121
Polonio Pass	705	2,826

<sup>a</sup>Includes transmission losses.

*Table B-17* presents a summary of actual and projected total variable OMP&R costs for each acre-foot conveyed through each aqueduct pumping plant and power plant for each year of the project. Following are provisions for calculating the variable OMP&R component of the Transportation Charge:

- An annual charge per acre-foot of projected water deliveries to all contractors served from or through each reach is determined so the projected variable OMP&R costs to be incurred for each reach will be returned to the State.

- The total annual variable OMP&R component for any contractor for a given reach is obtained by multiplying the unit charge associated with that reach by the quantity of water actually delivered from or through the reach to the contractor.

The data summarized in Table B-17 are derived by dividing the costs shown in Table B-3 by the water quantities shown in Table B-6. However, certain costs included in Table B-3 for extra peaking service, which would otherwise constitute variable OMP&R costs, are assigned directly to contractors requesting this type of service (see Bulletin 132-71, page 21, and Water Service Contractors Council Memo No. 593, July 10, 1970). Those costs are excluded from the unit charges shown in Table B-17. Peaking charges based on additional capacity ceased in 1983. Since 1984, costs are based on market energy rates. The amounts of extra peaking charges for additional power costs are shown in *Tables 8 and 9* on pages B-22 and B-23, respectively.

Unit rates shown in Table B-17 constitute the rates for the pumping plants and power plants listed. The cumulative rates constitute the total rates, cumulative from the Sacramento-San Joaquin Delta, and are applicable to deliveries from or downstream of the pumping plants and power plants. Extra peaking service costs are excluded.

*Table B-18* shows the variable OMP&R components of the Transportation Charge for each contractor for each year of the project repayment period. *Table B-18* is developed from the costs per acre-foot included in *Table B-17* and the delivery quantities for each contractor from each reach as indicated in *Table B-5A* and *Table B-5A-Adj*, plus any costs for extra peaking service. Those estimated components, subsequently adjusted for prior overpayments or

underpayments, are included in *Table F* of the respective water supply contracts.

*Table B-19* summarizes the annual Transportation Charges for each contractor (the sums of the corresponding amounts included in *Tables B-15, B-16A, B-16B, and B-18*). Those estimated payments, subsequently adjusted for prior overpayments or underpayments, are set forth in *Table G* of the respective water supply contracts.

In accordance with provisions of the Devil Canyon-Castaic contract, *Table B-19* and *Table G* include amounts of debt service and operating cost payments due from the six contractors located down-aqueduct from Devil Canyon and Castaic powerplants.

## Delta Water Charges

*Table B-20A* presents the calculation of the Delta Water Rate for the initial Conservation Facilities applicable in 2014 in accordance with the amended Article 22(e) and 22(g) of all 29 contracts. The Delta Water Rate was calculated at a Project Interest Rate of 4.610 percent, based on Conservation Facility costs shown in *Table B-13*. That Delta Water Rate is used to compute projected Delta Water Charges under Article 53(i) for the contractors who have executed the Monterey Amendment. Included in *Table B-20A* is the Delta Water Rate for the two contractors who have not executed the Monterey Amendment: Plumas County Flood Control and Water Conservation District and Empire West Side Irrigation District.

*Table B-20B* shows each component of the 2014 Delta Water Rate from *Table B-20A*.

Table 8 Extra Peaking Charges for Additional Power, by Pumping Plant (Dollars)

Year	Cordelia Napa	Cordelia Solano	Barker Slough	South Bay	Banks	Dos Amigos	Las Perillas and Badger Hill	Buena Vista	Teerink	Chrisman	Edmonston	Pearblossom	Oso	Total
1972	0	0	0	0	0	10,579	24,700	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	6,016	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	7,140	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	494	6,397	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	1,981	0	0	0	0	0	0	1,981
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	45,145	3,680	0	0	0	0	0	0	48,825
1979	0	0	0	0	0	0	3,306	0	0	0	0	0	0	3,306
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	12,126	0	0	0	0	0	0	0	12,126
1982	0	0	0	0	0	89,339	0	0	0	0	0	0	0	89,339
1983	0	0	0	35	7,594	3,534	152	0	0	0	0	0	0	11,315
1984	0	0	0	2,096	84,396	38,607	7,203	11,173	3,823	3,593	0	0	0	150,891
1985	0	0	0	1,480	19,612	8,841	763	4,488	4,412	8,929	28,353	0	0	76,878
1986	0	0	0	0	1,864	863	0	291	354	766	2,683	0	0	6,821
1987	0	0	0	604	17,129	7,838	835	2,295	1,806	3,460	11,058	0	0	45,025
1988	639	39	287	894	43,475	20,082	2,213	5,792	4,367	8,272	25,886	0	0	111,946
1989	2,491	566	1,483	70	40,251	18,642	1,935	3,401	1,531	2,058	3,793	0	0	76,221
1990	45	0	18	343	19,524	9,044	0	150	145	314	643	0	0	30,226
1991	903	0	281	0	21	8	0	15	17	39	139	41	0	1,464
1992	208	117	203	0	7,070	2,502	0	182	190	435	0	0	0	10,907
1993	0	681	889	4,483	123,080	54,741	0	8,898	5,458	10,900	35,068	11,139	0	255,337
1994	0	366	393	679	6,566	2,795	454	1,083	155	357	1,121	0	132	14,101
1995	0	0	0	1,717	24,464	9,422	27	1,865	3,475	782	1,104	400	0	43,256
1996	4	0	1	1,983	10,031	4,976	0	391	432	1,015	3,404	1,160	0	23,397
1997	0	1,780	2,152	3,107	337,357	165,774	1,753	34,604	12,296	15,910	21,028	0	0	595,761
1998	0	0	0	20,966	235,693	106,251	2,354	697	848	1,836	6,426	0	0	375,071
1999	0	0	0	0	63,196	26,235	0	3,394	4,136	8,959	31,350	7,740	0	145,010
2000-2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>4,290</b>	<b>3,549</b>	<b>5,707</b>	<b>38,457</b>	<b>1,041,323</b>	<b>637,838</b>	<b>70,909</b>	<b>78,719</b>	<b>43,445</b>	<b>67,625</b>	<b>172,056</b>	<b>20,480</b>	<b>132</b>	<b>2,184,530</b>



**Table 9 Extra Peaking Charges for Additional Power, by Contractor (Dollars)**

Year	Napa	Solano	Alameda Zone 7	Alameda County	Santa Clara	Dudley Ridge	Empire	Kern	Kings	Oak Flat	Tulare	AVEK	Castaic Lake	Coachella	Desert	Littlerock	Palmdale	San Gabriel	Total
1972	0	0	0	0	0	0	0	35,269	0	0	10	0	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	0	6,016	0	0	0	0	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	0	7,140	0	0	0	0	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	0	0	6,891	0	0	0	0	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	0	1,981	0	0	0	0	0	0	0	0	0	0	1,981
1977	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	2,035	0	44,484	42	0	0	2,264	0	0	0	0	0	0	48,825
1979	0	0	0	0	0	0	0	2,821	0	0	0	0	485	0	0	0	0	0	3,306
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	11,951	0	0	0	0	0	0	0	175	0	0	12,126
1982	0	0	0	0	0	2,173	0	80,945	0	0	0	4,671	1,128	0	0	0	0	422	89,339
1983	0	0	0	0	48	9,511	0	0	1,365	0	0	0	391	0	0	0	0	0	11,315
1984	0	0	0	0	2,874	0	0	144,021	281	809	0	0	2,906	0	0	0	0	0	150,891
1985	0	0	0	2,029	0	0	64	25,664	0	98	0	48,767	256	0	0	0	0	0	76,878
1986	0	0	0	0	0	0	0	0	0	13	2,194	4,614	0	0	0	0	0	0	6,821
1987	0	0	229	0	599	313	84	24,141	0	95	0	18,207	545	0	0	812	0	0	45,025
1988	892	73	665	561	0	1,853	1,404	58,905	0	72	2,368	44,526	627	0	0	0	0	0	111,946
1989	3,478	1,062	96	0	0	13	403	55,085	0	239	8,278	0	1,043	0	0	1,035	5,489	0	76,221
1990	63	0	470	0	0	0	0	28,587	0	0	0	0	0	0	0	81	1,025	0	30,226
1991	1,184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	0	1,464
1992	271	257	0	0	0	0	49	10,109	221	0	0	0	0	0	0	0	0	0	10,907
1993	0	1,570	6,122	0	0	0	3,757	97,812	504	0	74,577	0	0	24,983	41,156	0	4,856	0	255,337
1994	0	759	896	0	0	0	7	9,933	0	0	0	0	2,450	0	0	56	0	0	14,101
1995	0	0	2,353	0	0	10,197	0	28,085	310	0	0	0	27	0	0	0	2,284	0	43,256
1996	5	0	81	2,612	0	334	205	4,552	969	0	7,809	0	0	0	0	0	3,598	3,232	23,397
1997	0	3,932	3,999	0	0	6,190	0	546,733	0	40	0	0	0	0	0	0	34,867	0	595,761
1998	0	0	19,666	8,442	0	22,631	1	312,626	0	651	0	0	0	0	0	0	11,054	0	375,071
1999	0	0	0	0	0	0	0	76,425	0	0	6,922	0	0	0	0	0	11,576	50,087	145,010
2000-2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>5,893</b>	<b>7,653</b>	<b>34,577</b>	<b>13,644</b>	<b>3,521</b>	<b>55,250</b>	<b>5,974</b>	<b>1,620,176</b>	<b>3,692</b>	<b>2,017</b>	<b>102,158</b>	<b>123,049</b>	<b>9,858</b>	<b>24,983</b>	<b>41,156</b>	<b>2,439</b>	<b>74,749</b>	<b>53,741</b>	<b>2,184,530</b>

*Table B-21* summarizes the annual Delta Water Charge for each contractor. The projected charges in *Table B-21* are developed by multiplying the total rate per acre-foot, as shown in *Table B-20A*, by the amount of allocated water for each contractor, as shown in *Table B-4*.

The projected Delta Water Charges from 2014-2035 include the following assumptions:

1. *Escalation of projected operating costs at 2.5 percent per year for 2014 and 2015.*
2. *Escalation of projected operating costs at 1.0 percent per year for 2016-2035.*

## **Water System Revenue Bond Surcharge**

*Table B-22* summarizes the Water System Revenue Bond Surcharge (WSRB) to the Delta Water Charge and the transportation capital cost component for each contractor. The surcharge shown in *Table B-22* includes the financing costs of the WSRB surcharge, Series B through Series AE. This surcharge is levied according to an amendment to the water supply contracts, which was signed by all long-term water supply contractors.

## **Total Water Charges**

*Table B-23* summarizes the total annual charges to each contractor (the sum of the Transportation Charge in *Table B-19*, the Delta Water Charge in *Table B-21*, and the Water System Revenue Bond Surcharge in *Table B-22*). The charges do not reflect past payments by contractors and are unadjusted for prior overpayments or underpayments.

## **Equivalent Total Water Charges**

*Table B-24* presents the Transportation Charge and Delta Water Charge in terms of

the equivalent unit charge for each acre-foot of allocated water now projected for delivery to the respective contractors.

These equivalent charges would provide the same principal sum at the end of the project repayment period as annual payments to be made as part of the Delta Water Charge and Transportation Charge, plus interest at the Project Interest Rate, if applied to each acre-foot of allocated water delivered to date; all surplus water delivered prior to May 1, 1973; all Article 21 water deliveries in 1994 and after; and all allocated water now projected to be delivered during the remainder of the project repayment period (*Table B-5B*).

The equivalent unit Delta Water Charges included in *Table B-24* are greater than those presented in *Table B-20A* because current projections of allocated water service are less for most contractors than the amounts shown in *Table A*.

## **Equivalent Water Costs by Reach**

*Table B-25* presents a summary of the equivalent unit transportation cost of conveying allocated water through respective aqueduct reaches of the Project Transportation Facilities.

Those unit costs provide the basis of charges assessed for extra service (such as delivery of allocations down-aqueduct from a contractor's turnout) and for wheeling service to entities other than the long-term water supply contractors.

The cumulative unit conveyance costs indicated for reaches in *Table B-25* do not necessarily equal the equivalent unit Transportation Charges to contractors served from such reaches. The unit charges in *Table B-24* account for the rate of water demand buildup and cost allocation factors of the individual contractors; however, the

unit costs included in Table B-25 reflect the effect of melding the respective buildups and allocation criteria of all contractors whose allocations are conveyed through a given reach. Table B-25 also includes surplus water delivered prior to May 1, 1973, and Article 21 water deliveries in 1994 and afterwards.

## East Branch Enlargement Facility Charges

*Table B-26* reflects DWR's projection of annual capital costs of the East Branch Enlargement Facilities for each aqueduct reach. These projections will be redetermined in future bulletins to include the following:

- A reallocation of costs of constructing the present east branch facilities between Alamo Powerplant and Silverwood Lake;
- A reallocation of costs of Silverwood Lake to reflect additional use as a result of East Branch Enlargement operation;
- A reallocation of costs of San Bernardino Tunnel to reflect redistribution of flow capacities necessary for the East Branch Enlargement facilities; and
- Actual enlargement construction costs.

These costs will be recovered with interest from the seven Southern California water contractors participating in the enlargement, in accordance with their amended water supply contracts (see *Table 10*).

*Table B-27* lists the projected minimum OMP&R costs for each reach of the enlargement to be repaid by the seven East Branch Enlargement participating contractors. Currently, this table includes only minimum OMP&R costs attributable to the East Branch Enlargement. In accordance with Article 49(e)(1), the contractors participating in the East Branch Enlargement will also share in the remaining

minimum OMP&R costs of the affected reaches, in accordance with a formula developed by DWR in consultation with the affected contractors.

*Table B-28* shows each participating contractor's share of the estimated capital costs of the East Branch Enlargement shown in *Table B-26*.

*Table B-29* shows the amounts of the annual capital cost components of the East Branch Enlargement Transportation Charge for each participating contractor. This component consists of each contractor's allocated share of debt service on bonds sold to finance the enlargement.

*Table B-30* shows the minimum OMP&R components of the East Branch Enlargement Transportation Charge for each participating contractor for each year of the project repayment period. The amounts shown in *Table B-30* will recover the minimum OMP&R costs shown in *Table B-27*.

*Table B-31* shows the annual East Branch Enlargement Transportation charges for each participating contractor (the sum of the corresponding amounts included in *Tables B-29* and *B-30*).

## East Branch Extension Phase I Facility Charges

The East Branch Extension-Phase I charges recover associated costs for East Branch Extension facilities beginning at Devil Canyon Powerplant Afterbay and extending to the terminus at Noble Creek in the vicinity of Beaumont, Riverside County. These costs will be recovered from two contractors—San Bernardino and San Gorgonio—in accordance with their amended Water Supply contracts. The factors for distributing costs are shown in *Table 11*. *Table 12* shows the debt service for 2014.

## Short-Term Agreements

DWR and the long-term water supply contractors execute short-term agreements that affect the contractors' charges. DWR executed a five-year agreement in 1997 with 16 municipal and industrial contractors, who agreed to pay for allocated shares of Municipal Water Quality Investigations costs. Additional amendments were executed in 2002, 2006, 2008 and 2010 to extend the program. The MWQI charges under this agreement are included in the transportation minimum OMP&R components shown in Table B-16A.

Nine contractors executed a short-term agreement (1997 and 1998) to participate in the feasibility study for the American Basin conjunctive-use program. Feasibility study costs are included in Table B-16A.

Contractors have agreed to participate in several Delta Improvement programs that started in 2007 and that will possibly extend into the future.

The first agreement pertains to the Bay Delta Conservation Plan (BDCP) agreed to in the Memorandum of Agreement for Supplemental Funding for Certain Ecosystem Actions and Support for Implementation of Near-Term Water Supply, Water Quality, Ecosystem, and Levee Actions (MOA). The BDCP comprises two elements: fishery costs and consultation costs. These costs were added to the contractors' transportation minimum component for bill years 2007, through 2012.

The second agreement pertains to the non-BDCP costs of the MOA, comprising the Delta Vision and pelagic organism decline research costs. These costs were added to the contractors' conservation minimum component for bill years 2007 and 2008.

The third set of agreements pertains to the Delta Habitat Conservation and Conveyance Program (DHCCP). The agreements are between the Department and 20 participating SWP contractors to provide 50 percent of the funding for the preliminary planning phase of an improved Delta water conveyance facility. (The remaining 50 percent is provided by the U.S. Bureau of Reclamation.) This program will assess potential habitat restoration and water conveyance options in the Delta. For bill years 2008 through 2011, nearly \$70 million in charges associated with the DHCCP were billed directly to the 20 participating SWP contractors as a separate line item in the Statements of Charges, and are not reflected in the tables in this appendix.

A fourth set of agreements pertains to both DHCCP and BDCP. For bill years 2012 and 2013, an Agreement for Supplemental Funding for the Costs of Environmental Analysis, Planning and Design of Delta Conservation Measures, Including Delta Conveyance Options, was executed in 2012 between the Department and 16 participating SWP contractors to provide 50 percent of the project funding. In 2012, \$22 million was billed and in 2013, \$28 million was billed directly to the 16 participating contractors as a separate line item in the statements of charges.

During 2013, SWP water supply contractors agreed to participate in the 2013 San Joaquin River Flow Augmentation Program. The costs of the \$4 million program will be recovered in the 2014 Statements of Charges.

**Table 10 Determination of Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities among Participating Contractors**

Reach Number	Description
18A	Junction, West Branch, California Aqueduct, through Alamo Powerplant
19	Alamo Powerplant to Fairmont
20A	Fairmont through 70th Street West
20B	70th Street West to Palmdale
21	Palmdale to Littlerock Creek
22A	Littlerock Creek to Pearblossom Pumping Plant
22B	Pearblossom Pumping Plant to West Fork Mojave River
23B	West Fork Mojave River to Silverwood Lake (excluding Mojave Siphon Powerplant facilities)
23C	Mojave Siphon Powerplant facilities
24	Cedar Springs Dam and Silverwood Lake
25	Silverwood Lake to South Portal, San Bernardino Tunnel
26A	South Portal, San Bernardino Tunnel through Devil Canyon Powerplant
26B	Devil Canyon Powerplant Bypass

Share of Enlargement Capacity (cubic feet per second)

Reach Number	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	Metropolitan Water District of Southern California	Total
18A		151	13	136	6		1,200	1,506
19		151	13	136	6		1,200	1,506
20A	35	151	13	136	6		1,200	1,541
20B	35	151	13	136	6		1,200	1,541
21	35	151	13	136			1,200	1,535
22A	35	151	13	136			1,200	1,535
22B		151	13	136			1,200	1,500
23B		184	67	212			1,200	1,663
23C		184	67				1,200	1,451
24		190	78				1,200	1,468
25		193	83			63	1,200	1,539
26A		193	83			63	1,200	1,539
26B							300	300

Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities (flow ratios)

Reach Number	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	Metropolitan Water District of Southern California	Total
18A	0.00000000	0.10026560	0.00863214	0.09030544	0.00398406	0.00000000	0.79681276	1.00000000
19	0.00000000	0.10026560	0.00863214	0.09030544	0.00398406	0.00000000	0.79681276	1.00000000
20A	0.02271252	0.09798832	0.00843608	0.08825438	0.00398358	0.00000000	0.77871512	1.00000000
20B	0.02271252	0.09798832	0.00843608	0.08825438	0.00398358	0.00000000	0.77871512	1.00000000
21	0.02280130	0.09837134	0.00846906	0.08859935	0.00000000	0.00000000	0.78175895	1.00000000
22A	0.02280130	0.09837134	0.00846906	0.08859935	0.00000000	0.00000000	0.78175895	1.00000000
22B	0.00000000	0.10066667	0.00866667	0.09066667	0.00000000	0.00000000	0.79999999	1.00000000
23B	0.00000000	0.11064342	0.04028863	0.12748046	0.00000000	0.00000000	0.72158749	1.00000000
23C	0.00000000	0.12680910	0.04617505	0.00000000	0.00000000	0.00000000	0.82701585	1.00000000
24	0.00000000	0.12942779	0.05313351	0.00000000	0.00000000	0.00000000	0.81743870	1.00000000
25	0.00000000	0.12540611	0.05393112	0.00000000	0.00000000	0.04093567	0.77972710	1.00000000
26A	0.00000000	0.12540611	0.05393112	0.00000000	0.00000000	0.04093567	0.77972710	1.00000000
26B	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	1.00000000	1.00000000



**Table 11 Factors for Distributing Capital and Minimum OMP&R Costs of the East Branch Extension Facilities**

Reach Number	Reach Description	San Bernardino Municipal Water District	San Gorgonio Pass Water Agency	Total
<b>Capital</b>				
all	Average of the contractors' participation of EBX facilities	0.458417	0.541583	1.000000
<b>Minimum</b>				
1	Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road	0.557330	0.442670	1.000000
2A	Junction Foothill Pipeline near Cone Camp Rd to Greenspot Pump Station	0.557330	0.442670	1.000000
2B	Greenspot Pump Station to Morton Canyon Valve Vault	0.777778	0.222222	1.000000
2C	Morton Canyon Valve Vault to Crafton Hills Pump Station	0.777778	0.222222	1.000000
3A	Crafton Hills Pump Station to Carter Street Valve Vault	0.557330	0.442670	1.000000
3B	Carter Street Valve Vault to Garden Air Creek, South of San Bernardino County Line	0.557330	0.442670	1.000000
4A	Garden Air Creek to Cherry Valley Pump Station		1.000000	1.000000
4B	Cherry Valley Pump Station to Terminus at Noble Creek		1.000000	1.000000

**Table 12 East Branch Extension Facilities Debt Service for 2014**

Contractor	Share of Participation (%)	Total Debt Service Charge (Dollars)
San Bernardino	45.84170	7,767,442
San Gorgonio	54.15830	9,176,611
<b>Total</b>	100.00000	16,944,053

## Tables B-1 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-1 Factors for Distributing Reach Capital Costs among Contractors <sup>a</sup>**

Reach No.	Reach Description	NORTH BAY AREA		SOUTH BAY AREA				Total
		Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor South Bay	
<b>NORTH BAY AQUEDUCT</b>								
1	Barker Slough thru Fairfield/Vacaville Turnout	0.29667896	0.70332104					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.38414552	0.61585448					1.00000000
3A	Cordelia Forebay thru Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay thru Napa Turnout Reservoir	1.00000000						1.00000000
<b>SOUTH BAY AQUEDUCT</b>								
1	Bethany Reservoir thru Altamont Turnout			0.22599612	0.20663021	0.49237700	0.07499667	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.22599658	0.20663059	0.49237783	0.07499500	1.00000000
4	Patterson Reservoir to Del Valle Junction			0.19504795	0.21450017	0.51113249	0.07931939	1.00000000
5	Del Valle Junction thru Lake Del Valle			0.14436367	0.12972254	0.33715573	0.38875806	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.14599918	0.21144710	0.50574745	0.13680627	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout				0.25176680	0.60218448	0.14604872	1.00000000
8	Vallecitos Turnout thru Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout thru Santa Clara Terminal Facilities					1.00000000		1.00000000
<b>CALIFORNIA AQUEDUCT</b>								
1	Delta thru Bethany Reservoir			0.00954737	0.00872917	0.02080118	0.00342507	N/A

Reach No.	Reach Description	CENTRAL COASTAL AREA		SOUTHERN CALIFORNIA AREA				
		San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency
<b>CALIFORNIA AQUEDUCT</b>								
1	Delta thru Bethany Reservoir	0.00533010	0.00983337	0.02939084	0.01285827	0.00528315	0.00133612	0.00871300
2A	Bethany Reservoir to Orestimba Creek	0.00557213	0.01027988	0.03072531	0.01343201	0.00552068	0.00139620	0.00910474
2B	Orestimba Creek to O'Neill Forebay	0.00557824	0.01029119	0.03075915	0.01345351	0.00552831	0.00139814	0.00911733
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557719	0.01028923	0.03075332	0.01345294	0.00552772	0.00139798	0.00911637
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557607	0.01028717	0.03074719	0.01345233	0.00552710	0.00139784	0.00911536
5	Panoche Creek to Five Points	0.00557467	0.01028462	0.03073954	0.01345157	0.00552633	0.00139763	0.00911409
6	Five Points to Arroyo Pasaiero	0.00557257	0.01028074	0.03072799	0.01345042	0.00552517	0.00139733	0.00911216
7	Arroyo Pasaiero to Kettleman City	0.00557189	0.01027949	0.03072428	0.01345006	0.00552480	0.00139723	0.00911154
8C	Kettleman City thru Milham Avenue	0.00557103	0.01027792	0.03071961	0.01344960	0.00552432	0.00139712	0.00911076
8D	Milham Avenue thru Avenal Gap	0.00568611	0.01049020	0.03135418	0.01373353	0.00563986	0.00142632	0.00930130
9	Avenal Gap thru Twisselman Road			0.03426625	0.01356094	0.00616886	0.00156011	0.01017373
10A	Twisselman Road thru Lost Hills			0.03481391	0.01377767	0.00626946	0.00158556	0.01033963
11B	Lost Hills to 7th Standard Road			0.03835043	0.01517717	0.00691699	0.00174933	0.01140749
12D	7th Standard Road thru Elk Hills Road			0.04031661	0.01595523	0.00727790	0.00184059	0.01200265
12E	Elk Hills Road thru Tupman Road			0.04037074	0.01597665	0.00728878	0.00184332	0.01202059
13B	Tupman Road to Buena Vista Pumping Plant			0.04379882	0.01733322	0.00791595	0.00200194	0.01305492
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04599268	0.01820137	0.00831952	0.00210399	0.01372049
14B	Santiago Creek thru Old River Road			0.04682530	0.01853084	0.00847388	0.00214303	0.01397505
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04825217	0.01909545	0.00873768	0.00220973	0.01441013
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04905609	0.01941356	0.00888679	0.00224744	0.01465600
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05089794	0.02014241	0.00922722	0.00233351	0.01521742
17E	Edmonston Pumping Plant to Porter Tunnel			0.05329388	0.02109050	0.00967107	0.00244575	0.01594937
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05340725	0.02113537	0.00969176	0.00245098	0.01598349
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13238112		0.02399391	0.00606795	0.03957043
19	Alamo Powerplant to Fairmont			0.13237766		0.02399451	0.00606811	0.03957141
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06847931		0.02576425	0.00651573	0.04249001
20B	70th Street West to Palmdale			0.02276024		0.02702917	0.00683555	0.04457607
21	Palmdale to Litterock Creek			0.02318952		0.02754716	0.00696651	0.04543034
22A	Litterock Creek to Pearblossom Pumping Plant			0.01181870		0.02794143	0.00706621	0.04608043
22B	Pearblossom Pumping Plant to West Fork Mojave River			0.02827552		0.00715074	0.00715074	0.04663153
23	West Fork Mojave River to Silverwood Lake			0.00324449		0.00818122	0.00818122	0.00535117
24	Cedar Springs Dam and Silverwood Lake			0.01024605		0.01251569	0.01251569	0.01690478
25	Silverwood Lake to South Portal San Bernardino Tunnel							
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.							
28G	Devil Canyon Powerplant to Barton Road							
28H	Barton Road to Lake Perris							
28J	Perris Dam and Lake Perris							
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.					0.03544337		
29F	Oso Pumping Plant thru Quail Embankment					0.03544339		
29G	Quail Embankment thru Warne Powerplant					0.03544339		
29H	Pyramid Dam and Lake					0.02817144		
29J	Pyramid Lake thru Castaic Powerplant					0.03544338		
30	Castaic Dam and Lake					0.02927284		
31A	Avenal Gap to Devil's Den Pumping Plant	0.10560301	0.19482503			0.07364766		
33A	Devil's Den Pumping Plant through Tank 1	0.10101221	0.89898779					
33B	Tank 1 through Chorro Valley Turnout	0.09912818	0.90087182					
34	Chorro Valley Turnout through Lopez Turnout	0.05479573	0.94520427					
35	Lopez Turnout through Guadalupe Turnout		1.00000000					

(a) Proportionate Use Factors do not reflect permanent water transfers as a result of the Monterey Amendment and after.

**TABLE B-1 Factors for Distributing Reach Capital Costs among Contractors<sup>a</sup>**

Reach No.	SAN JOAQUIN VALLEY AREA							
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District
				Municipal and Industrial	Agricultural			
<b>CALIFORNIA AQUEDUCT</b>								
1	0.01707770	0.00088678	0.00254693	0.02741768	0.30629913	0.00090695	0.00167121	0.03504975
2A	0.01781031	0.00092482	0.00266258	0.02864263	0.31945188	0.00094747	0.00174288	0.03655331
2B	0.01785838	0.00092731	0.00266550	0.02868743	0.32030556	0.00094896		0.03665201
3	0.01786337	0.00092757	0.00266499	0.02868589	0.32039254	0.00094892		0.03666225
4	0.01786863	0.00092785	0.00266446	0.02868428	0.32048398	0.00094886		0.03667303
5	0.01787517	0.00092819	0.00266380	0.02868227	0.32059816	0.00094879		0.03668649
6	0.01788508	0.00092870	0.00266279	0.02867923	0.32077093	0.00094868		0.03670685
7	0.01788826	0.00092887	0.00266246	0.02867825	0.32082633	0.00094864		0.03671338
8C	0.01789228	0.00092909	0.00266205	0.02867702	0.32089625	0.00094859		0.03672162
8D	0.01828779		0.00271703	0.02928147	0.32798200			0.01820857
9				0.03204523	0.32739538			
10A				0.03257442	0.31658608			
11B				0.03597398	0.24684668			
12D				0.03787171	0.20804762			
12E				0.03793198	0.20695175			
13B				0.01458796	0.16600071			
14A				0.00620338	0.13319181			
14B				0.00632023	0.11741558			
14C				0.00651962	0.09039633			
15A				0.00663252	0.07516317			
16A				0.00688973	0.04028829			
17E				0.00212516				
31A			0.05046240		0.57546190			

Reach No.	SOUTHERN CALIFORNIA AREA (continued)									Total
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District		
<b>CALIFORNIA AQUEDUCT</b>										
1	0.00049180	0.01101147	0.00369131	0.02362857	0.00650354	0.00398392	0.43929350	0.00429212		1.00000000
2A	0.00051413	0.01151136	0.00385891	0.02469101	0.00679699	0.00416304	0.45921072	0.00448701		1.00000000
2B	0.00051469	0.01152409	0.00386317	0.02472511	0.00680570	0.00416880	0.45973548	0.00449194		1.00000000
3	0.00051461	0.01152193	0.00386244	0.02472246	0.00680478	0.00416835	0.45965407	0.00449108		1.00000000
4	0.00051451	0.01151965	0.00386167	0.02471968	0.00680380	0.00416787	0.45956848	0.00449019		1.00000000
5	0.00051440	0.01151681	0.00386070	0.02471620	0.00680259	0.00416730	0.45946161	0.00448907		1.00000000
6	0.00051419	0.01151251	0.00385926	0.02471095	0.00680076	0.00416640	0.45929991	0.00448738		1.00000000
7	0.00051413	0.01151113	0.00385879	0.02470927	0.00680016	0.00416612	0.45924807	0.00448685		1.00000000
8C	0.00051405	0.01150938	0.00385821	0.02470716	0.00679941	0.00416576	0.45918261	0.00448616		1.00000000
8D	0.00052466	0.01174718	0.00393793	0.02522383	0.00694100	0.00425288	0.46868533	0.00457883		1.00000000
9	0.00057339	0.01283841	0.00430367	0.02758959	0.00758975	0.00465175	0.51227887	0.00500407		1.00000000
10A	0.00058254	0.01304366	0.00437246	0.02803943	0.00771262	0.00472760	0.52049091	0.00508405		1.00000000
11B	0.00064171	0.01436906	0.00481665	0.03093503	0.00850448	0.00521581	0.57349473	0.00560046		1.00000000
12D	0.00067463	0.01510596	0.00506361	0.03254889	0.00894541	0.00548790	0.60297374	0.00588755		1.00000000
12E	0.00067553	0.01512626	0.00507040	0.03259749	0.00895830	0.00549608	0.60379667	0.00589546		1.00000000
13B	0.00073290	0.01641098	0.00550099	0.03540212	0.00972547	0.00596896	0.65516902	0.00639604		1.00000000
14A	0.00076961	0.01723325	0.00577656	0.03720681	0.01021819	0.00627322	0.68807273	0.00671639		1.00000000
14B	0.00078354	0.01754538	0.00588113	0.03789703	0.01040613	0.00638960	0.70057530	0.00683798		1.00000000
14C	0.00080743	0.01808019	0.00606036	0.03907670	0.01072763	0.00658850	0.72199174	0.00704634		1.00000000
15A	0.00082089	0.01838154	0.00616135	0.03974336	0.01090913	0.00670088	0.73406357	0.00716371		1.00000000
16A	0.00085171	0.01907194	0.00639271	0.04126559	0.01132404	0.00695754	0.76170731	0.00743264		1.00000000
17E	0.00089182	0.01997003	0.00669365	0.04325018	0.01186455	0.00729213	0.79767940	0.00778251		1.00000000
17F	0.00089372	0.02001251	0.00670788	0.04334270	0.01188988	0.00730773	0.79937767	0.00779906		1.00000000
18A	0.00221525	0.04960424	0.01662680	0.10730448	0.02944860	0.01809192	0.57469530			1.00000000
19	0.00221522	0.04960300	0.01662640	0.10730707	0.02944876	0.01809230	0.57469556			1.00000000
19C										1.00000000
20A	0.00237800	0.05324853	0.01784830	0.11522152	0.03161798	0.01942666	0.61700971			1.00000000
20B	0.00249470	0.05586076	0.01872390	0.12087843	0.03316986	0.02038045	0.64729087			1.00000000
21	0.00254199	0.05692053		0.12319480	0.03380324	0.02077093	0.65963498			1.00000000
22A		0.05773082		0.12495766	0.03428605	0.02106816	0.66905054			1.00000000
22B		0.05842136		0.12645207	0.03469614	0.02132008	0.67705256			1.00000000
23				0.14467451	0.03969010	0.02439237	0.77446614			1.00000000
24				0.22243002	0.04339444	0.02843498	0.66607404			1.00000000
25				0.14947726	0.03997502	0.02520426	0.78534346			1.00000000
26A				0.14947726	0.03997502	0.02520426	0.78534346			1.00000000
28G				0.05126137			0.94873863			1.00000000
28H							1.00000000			1.00000000
28J							1.00000000			1.00000000
29A							0.95147783	0.01307880		1.00000000
29F							0.95147785	0.01307876		1.00000000
29G							0.95147785	0.01307876		1.00000000
29H							0.96278381	0.00904475		1.00000000
29J							0.95147787	0.01307875		1.00000000
30							0.96212388	0.00860328		1.00000000
31A										1.00000000
33A										1.00000000
34										1.00000000
35										1.00000000

(a) Proportionate Use Factors do not reflect permanent water transfers as a result of the Monterey Amendment and after.

**TABLE B-2 Factors for Distributing Reach Minimum OMP&R Costs Among Contractors <sup>a</sup>**

Reach No.	Reach Description	NORTH BAY AREA		SOUTH BAY AREA				Total
		Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor South Bay	
<b>NORTH BAY AQUEDUCT</b>								
1	Barker Slough thru Fairfield/Vacaville Turnout	0.29251728	0.70748272					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.42000793	0.57999207					1.00000000
3A	Cordelia Forebay thru Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay thru Napa Turnout Reservoir	1.00000000						1.00000000
<b>SOUTH BAY AQUEDUCT</b>								
1	Bethany Reservoir thru Altamont Turnout			0.33980110	0.19515838	0.46504052	0.00000000	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.33978741	0.19516252	0.46505007	0.00000000	1.00000000
4	Patterson Reservoir to Del Valle Junction			0.31610985	0.20216089	0.48172926	0.00000000	1.00000000
5	Del Valle Junction thru Lake Del Valle			0.53312173	0.12972254	0.33715573	0.00000000	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.32478705	0.19906896	0.47614399	0.00000000	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout			0.14604872	0.25176680	0.60218448	0.00000000	1.00000000
8	Vallecitos Turnout thru Alameda-Bayside Turnout				0.27934645	0.72065355	1.00000000	1.00000000
9	Alameda-Bayside Turnout thru Santa Clara Terminal Facilities					1.00000000		1.00000000
<b>CALIFORNIA AQUEDUCT</b>								
1	Delta thru Bethany Reservoir				0.00870518	0.02074403		N/A

Reach No.	Reach Description	CENTRAL COASTAL AREA		SOUTHERN CALIFORNIA AREA				
		San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency
<b>CALIFORNIA AQUEDUCT</b>								
1	Delta thru Bethany Reservoir	0.00531721	0.00980965	0.03130405	0.02543374	0.03261268	0.00133224	0.01285665
2A	Bethany Reservoir to Orestimba Creek	0.00556969	0.01027545	0.03278483	0.02659691	0.03414316	0.00139489	0.01346065
2B	Orestimba Creek to O'Neill Forebay	0.00557579	0.01028673	0.03282438	0.02665421	0.03419205	0.00139681	0.01347952
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557473	0.01028476	0.03281919	0.02665743	0.03418891	0.00139665	0.01347815
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557360	0.01028270	0.03281372	0.02666079	0.03418560	0.00139650	0.01347672
5	Panoche Creek to Five Points	0.00557222	0.01028014	0.03280690	0.02666499	0.03418147	0.00139632	0.01347494
6	Five Points to Arroyo Pasajero	0.00557012	0.01027626	0.03279659	0.02667136	0.03417523	0.00139601	0.01347223
7	Arroyo Pasajero to Kettleman City	0.00556944	0.01027501	0.03279328	0.02667340	0.03417322	0.00139591	0.01347136
8C	Kettleman City thru Milham Avenue	0.00551362	0.01017203	0.03245660	0.02634293	0.03380506	0.00138104	0.01332714
8D	Milham Avenue thru Avenal Gap	0.00562578	0.01037893	0.03311977	0.02690221	0.03450222	0.00140945	0.01360166
9	Avenal Gap thru Twisselman Road			0.03493411	0.02763901	0.03512440	0.00151824	0.01433245
10A	Twisselman Road thru Lost Hills			0.03547485	0.02809182	0.03566993	0.00154221	0.01455728
11B	Lost Hills to 7th Standard Road			0.03883725	0.03088074	0.03906019	0.00169071	0.01595216
12D	7th Standard Road thru Elk Hills Road			0.04070122	0.03243926	0.04094051	0.00177325	0.01672689
12E	Elk Hills Road thru Tupman Road			0.04075249	0.03249392	0.04099311	0.00177575	0.01674963
13B	Tupman Road to Buena Vista Pumping Plant			0.04405954	0.03522722	0.04432685	0.00192161	0.01812038
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04615827	0.03679301	0.04644447	0.00201466	0.01899348
14B	Santiago Creek thru Old River Road			0.04681006	0.03306763	0.04710503	0.00204428	0.01926931
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04799466	0.03185038	0.04830256	0.00209736	0.01976289
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04868827	0.03231056	0.04900353	0.00212840	0.02005610
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05029198	0.03337461	0.05062291	0.00219981	0.02072526
17E	Edmonston Pumping Plant to Porter Tunnel			0.05228621	0.03469775	0.05263722	0.00228873	0.02155828
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05239008	0.03476667	0.05274186	0.00229330	0.02160123
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13774725	0.11306511	0.11306511	0.00603056	0.05137695
19	Alamo Powerplant to Fairmont			0.13774370		0.11306344	0.00603069	0.05137766
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06855702		0.12212506	0.00651522	0.05550243
20B	70th Street West to Palmdale			0.02284441		0.12811683	0.00683511	0.05822670
21	Palmdale to Littlerock Creek			0.02327543		0.13055246	0.00696606	0.05933989
22A	Littlerock Creek to Pearblossom Pumping Plant			0.01190663		0.13241285	0.00706574	0.06018798
22B	Pearblossom Pumping Plant to West Fork Mojave River			0.00195128		0.13374659	0.00713697	0.06079440
23	West Fork Mojave River to Silverwood Lake					0.12416451	0.00818135	0.02168414
24	Cedar Springs Dam and Silverwood Lake					0.02651510	0.01251569	0.01910229
25	Silverwood Lake to South Portal San Bernardino Tunnel					0.09751351		0.01317145
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.					0.12013473		0.01622697
28G	Devil Canyon Powerplant to Barton Road					0.30672992		0.04143095
28H	Barton Road to Lake Perris					0.32330286		0.04366951
28J	Perris Dam and Lake Perris					0.32330202		0.04366970
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.			0.00296720		0.05726734		
29F	Oso Pumping Plant thru Quail Embankment			0.00296796		0.05726649		
29G	Quail Embankment thru Warne Powerplant					0.05742327		
29H	Pyramid Dam and Lake					0.03349572		
29J	Pyramid Lake thru Castaic Powerplant					0.05740996		
30	Castaic Dam and Lake					0.03248607		
31A	Avenal Gap to Devil's Den Pumping Plant	0.10542164	0.19449108			0.07351496	0.05400251	0.01800084
33A	Devil's Den Pumping Plant thru Tank 1	0.10101221	0.88898779					
33B	Tank 1 thru Chorro Valley Turnout	0.10101221	0.88898779					
34	Chorro Valley Turnout through Lopez Turnout	0.05271277	0.94728723					
35	Lopez Turnout thru Guadalupe Turnout		1.00000000					

(a) Proportionate use factors apply to 2014, and reflect permanent capacity water transfers that have been signed as of February 1, 2013



**TABLE B-2 Factors for Distributing Reach Minimum OMP&R Costs Among Contractors<sup>a</sup>**

Reach No.	SAN JOAQUIN VALLEY AREA										
	Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District
							Municipal and Industrial	Agricultural			
CALIFORNIA AQUEDUCT											
1	0.00101482	0.00145895	0.02319905	0.01556243	0.00088459	0.00254076	0.02734590	0.27096967	0.00247146	0.00166714	0.02580275
2A	0.00106145	0.00152591	0.00868255	0.01626022	0.00092426	0.00266141	0.02862336	0.28310827	0.00256398	0.00174185	0.02695973
2B	0.00106360	0.00152905	0.00869825	0.01630407	0.00092676	0.00266433	0.02866805	0.28387888	0.00256988		0.02703241
3	0.00106370	0.00152905	0.00869840	0.01630863	0.00092702	0.00266381	0.02866651	0.28396019	0.00259028		0.02703994
4	0.00106379	0.00152934	0.00869857	0.01631341	0.00092729	0.00266329	0.02866489	0.28404567	0.00259072		0.02704786
5	0.00106390	0.00152952	0.00869878	0.01631938	0.00092763	0.00266262	0.02866286	0.28415242	0.00259125		0.02705775
6	0.00106408	0.00152980	0.00869911	0.01632841	0.00092814	0.00266161	0.02865978	0.28431393	0.00259206		0.02707272
7	0.00106415	0.00152990	0.00869922	0.01633132	0.00092832	0.00266127	0.02865879	0.28436573	0.00259232		0.02707752
8C	0.00105126	0.00151129	0.00859816	0.01610927	0.00091570	0.00263462	0.02834176	0.28048320	0.00255949		0.02670939
8D	0.00107347	0.00154326	0.00877819	0.01645861		0.00268820	0.02892932	0.28657165	0.00165698		0.00825002
9	0.00079202	0.00109293	0.00780277				0.03118146	0.29039489			
10A	0.00080497	0.00111060	0.00792824				0.03167956	0.27925553			
11B	0.00064482	0.00094422	0.00351686				0.03476028	0.21585735			
12D							0.03647581	0.18320074			
12E							0.03653031	0.18208939			
13B							0.01399620	0.14069941			
14A							0.00593620	0.10824427			
14B							0.00602565	0.09961401			
14C							0.00618461	0.07855675			
15A							0.00627746	0.06506548			
16A							0.00649053	0.03395346			
17E							0.00198711				
31A	0.00628695	0.00977801	0.02617705			0.05037550		0.36716813	0.00176551		

Reach No.	SOUTHERN CALIFORNIA AREA (continued)									Total
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District		
CALIFORNIA AQUEDUCT										
1	0.00049042	0.02026846	0.00458393	0.02356016	0.00648465	0.00397230	0.41532941	0.00427772		1.00000000
2A	0.00051371	0.02120839	0.00480104	0.02466789	0.00679061	0.00415906	0.43501989	0.00448084		1.00000000
2B	0.00051427	0.02124586	0.00480668	0.02470189	0.00679930	0.00416478	0.43551670	0.00448575		1.00000000
3	0.00051418	0.02124600	0.00480586	0.02469923	0.00679838	0.00416433	0.43543961	0.00448491		1.00000000
4	0.00051409	0.02124614	0.00480502	0.02469644	0.00679739	0.00416387	0.43535858	0.00448401		1.00000000
5	0.00051397	0.02124632	0.00480395	0.02469294	0.00679616	0.00416328	0.43525739	0.00448290		1.00000000
6	0.00051377	0.02124659	0.00480235	0.02468767	0.00679431	0.00416240	0.43510427	0.00448120		1.00000000
7	0.00051370	0.02124666	0.00480184	0.02468598	0.00679371	0.00416212	0.43505517	0.00448066		1.00000000
8C	0.00050856	0.02100184	0.00475291	0.02442298	0.00672285	0.00411777	0.44212477	0.00443576		1.00000000
8D	0.00051889	0.02144088	0.00484990	0.02492555	0.00686064	0.00420251	0.45118592	0.00452599		1.00000000
9	0.00055840	0.01993025	0.00522053	0.02684929	0.00738763	0.00452685	0.48584413	0.00487064		1.00000000
10A	0.00056704	0.02023748	0.00530173	0.02727291	0.00750339	0.00459828	0.49345815	0.00494603		1.00000000
11B	0.00062078	0.02214921	0.00580626	0.02989855	0.00822175	0.00504097	0.54070314	0.00541476		1.00000000
12D	0.00065057	0.02320837	0.00600264	0.03135808	0.00862068	0.00528705	0.56694033	0.00567460		1.00000000
12E	0.00065138	0.02323692	0.00601020	0.03140201	0.00863233	0.00529446	0.56770637	0.00568173		1.00000000
13B	0.00070422	0.02511768	0.00649798	0.03398130	0.00933833	0.00572934	0.61413721	0.00614273		1.00000000
14A	0.00073776	0.02630988	0.00680757	0.03562677	0.00978788	0.00600678	0.64370370	0.00643530		1.00000000
14B	0.00074816	0.02667816	0.00690372	0.03615036	0.00992971	0.00609507	0.65303271	0.00652614		1.00000000
14C	0.00076711	0.02734954	0.00707846	0.03708884	0.01018518	0.00625328	0.66983429	0.00669124		1.00000000
15A	0.00077820	0.02774279	0.00718080	0.03763751	0.01033462	0.00634580	0.67966257	0.00678791		1.00000000
16A	0.00080382	0.02865294	0.00741738	0.03890023	0.01067907	0.00655870	0.70231784	0.00701146		1.00000000
17E	0.00083567	0.02978434	0.00771157	0.04047293	0.01110787	0.00682388	0.73051901	0.00728943		1.00000000
17F	0.00083733	0.02984345	0.00772689	0.04055367	0.01113000	0.00683749	0.73197412	0.00730391		1.00000000
18A	0.00220155	0.04929713	0.01652427	0.10664131	0.02926634	0.01798005	0.46986948			1.00000000
19	0.00220151	0.04929585	0.01652388	0.10664396	0.02926656	0.01798044	0.46987231			1.00000000
19C										1.00000000
20A	0.00237787	0.05324421	0.01784728	0.11521174	0.03161525	0.01942494	0.50757898			1.00000000
20B	0.00249455	0.05585607	0.01872278	0.12086783	0.03316690	0.02037859	0.53249023			1.00000000
21	0.00254183	0.05691567		0.12318381	0.03380017	0.02076901	0.54265567			1.00000000
22A		0.05772584		0.12494639	0.03428290	0.02106619	0.55040548			1.00000000
22B		0.05830722		0.12620561	0.03462835	0.02127845	0.55595113			1.00000000
23				0.14467451	0.03969010	0.02439237	0.63721302			1.00000000
24				0.22243002	0.04339445	0.02843498	0.64760747			1.00000000
25				0.11825184	0.03722720	0.01993915	0.71389685			1.00000000
26A				0.14947726	0.03997501	0.02520426	0.64898177			1.00000000
28G				0.05126136			0.60057777			1.00000000
28H							0.63302763			1.00000000
28J							0.63302828			1.00000000
29A							0.92702291	0.01274255		1.00000000
29F							0.92702302	0.01274253		1.00000000
29G							0.92979606	0.01278067		1.00000000
29H							0.95753173	0.00897255		1.00000000
29J							0.92980918	0.01278086		1.00000000
30							0.95895422	0.00855971		1.00000000
31A		0.09301782								1.00000000
33A										1.00000000
33B										1.00000000
34										1.00000000
35										1.00000000

(a) Proportionate use factors apply to 2014, and reflect permanent capacity water transfers that have been signed as of February 1, 2013

**TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant <sup>a</sup>**

(in dollars)

Sheet 1 of 3

Calendar Year	NORTH BAY AQUEDUCT			SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT			
	Reach 1	Reach 3A	Reach 3B	Reach 1 (c)	Reach 1	Reach 4	Reach 14A	Reach 15A
	Barker Slough Pumping P.	Cordelia Pumping P. Solano	Cordelia Pumping P. Napa (b)	South Bay & Del Valle Pumping P.	Banks Pumping P.	Dos Amigos Pumping P.	Buena Vista Pumping P.	Teerink Pumping P.
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	36,771	0	0	0	0
1963	0	0	0	55,654	0	0	0	0
1964	0	0	0	73,240	0	0	0	0
1965	0	0	0	137,665	0	0	0	0
1966	0	0	0	186,064	0	0	0	0
1967	0	0	0	216,515	15,453	0	0	0
1968	0	0	6,989	336,671	452,630	202,947	0	0
1969	0	0	8,551	257,579	293,741	135,425	0	0
1970	0	0	13,598	396,358	346,215	211,197	1	0
1971	0	0	10,609	381,662	574,015	225,188	115,801	2,564
1972	0	0	14,434	598,702	933,292	492,633	198,914	68,304
1973	0	0	14,449	493,490	688,030	381,232	263,468	236,623
1974	0	0	17,473	565,575	783,562	447,772	315,939	324,966
1975	0	0	14,779	349,758	1,341,019	518,322	552,958	552,952
1976	0	0	20,856	571,361	1,638,453	641,115	712,947	713,875
1977	0	0	22,635	512,996	1,013,307	277,439	265,169	300,985
1978	0	0	21,692	586,355	2,339,502	560,759	689,236	616,104
1979	0	0	16,237	605,136	3,554,256	1,008,564	776,016	749,188
1980	0	0	19,945	523,369	2,083,336	1,129,152	1,051,629	1,047,495
1981	0	0	23,842	567,692	3,952,931	1,939,189	1,336,867	1,319,739
1982	0	0	12,157	605,780	3,082,031	1,363,705	1,200,226	1,213,660
1983	0	0	2,342	82,222	1,001,612	396,086	450,801	432,165
1984	0	0	4,822	271,543	1,856,959	976,773	823,681	770,618
1985	0	0	10,188	451,020	3,186,029	1,621,418	1,409,980	1,411,621
1986	0	0	15,501	807,984	6,601,752	2,627,407	2,405,224	2,432,322
1987	0	0	27,223	886,956	5,820,699	2,555,341	2,295,575	2,286,066
1988	17,813	0	24,020	909,300	6,365,669	2,648,986	2,628,985	2,636,224
1989	29,819	43,846	26,519	1,161,160	9,964,956	4,002,409	4,130,033	4,159,440
1990	52,210	67,109	40,775	1,834,626	10,554,762	4,541,508	5,855,196	6,099,412
1991	10,429	10,118	5,252	378,966	1,994,449	510,781	944,445	1,077,662
1992	13,319	13,070	9,406	311,251	3,385,375	1,235,571	1,366,433	1,441,966
1993	(11,941)	(8,753)	(5,392)	(158,214)	537,591	348,409	(127,617)	(104,923)
1994	46,791	39,624	29,189	799,624	6,013,464	2,450,174	2,778,971	2,823,137
1995	20,014	20,620	11,791	247,645	4,066,595	1,532,502	952,304	877,047
1996	57,320	47,288	23,483	619,160	8,385,766	4,056,188	2,565,655	2,378,677
1997	67,416	52,935	21,955	986,312	7,010,228	2,870,194	2,637,433	2,469,147
1998	(11,427)	(10,141)	(4,879)	(133,721)	204,374	(365,361)	(319,014)	(295,861)
1999	34,881	25,288	11,623	507,549	6,333,906	2,421,869	1,691,167	1,446,775
2000	58,113	40,421	14,847	706,466	7,849,458	3,020,023	2,891,468	3,052,117
2001	374,919	250,132	214,039	4,248,059	27,592,213	10,690,521	15,011,328	15,907,217
2002	192,540	104,564	61,470	17,666,689	7,284,182	17,666,689	8,870,415	9,554,380
2003	198,509	118,446	97,810	2,592,633	24,698,300	9,177,248	10,700,053	11,535,369
2004	261,564	138,880	106,974	2,414,624	22,854,796	9,426,446	12,567,612	13,722,260
2005	289,322	146,837	148,291	2,773,818	33,561,779	12,664,845	11,765,327	12,532,444
2006	231,646	110,822	143,783	2,473,204	23,274,172	10,059,712	11,063,183	11,835,390
2007	453,385	223,276	253,979	4,745,772	23,299,146	11,457,343	17,216,558	18,676,942
2008	406,994	183,126	293,675	3,262,284	14,018,652	6,267,150	11,024,961	12,718,735
2009	242,967	114,295	179,951	2,762,664	15,022,553	4,801,087	7,870,353	8,741,557
2010	278,114	110,606	235,465	2,608,330	28,250,949	10,234,104	11,160,713	11,750,628
2011	298,638	113,185	263,297	3,635,590	41,952,332	16,074,240	15,027,047	15,747,952
2012	257,744	136,221	180,031	3,845,853	27,163,936	12,759,987	15,205,597	15,507,098
2013	711,665	212,258	633,139	5,439,339	40,756,513	15,525,544	19,314,490	22,387,903
2014	750,375	196,249	723,250	5,855,409	46,315,245	16,299,038	20,346,112	23,547,528
2015	694,974	383,255	663,264	6,585,187	45,323,173	16,807,572	21,101,971	24,427,002
2016	485,440	260,765	547,224	4,986,539	29,382,919	15,025,449	19,276,691	19,871,486
2017	485,440	260,412	546,914	4,986,539	37,961,825	15,022,179	19,270,821	19,865,120
2018	485,440	262,632	548,866	5,047,023	20,481,020	15,045,594	19,394,377	20,011,846
2019	485,440	262,632	548,866	5,047,023	40,376,412	15,045,594	19,386,240	20,003,021
2020	485,440	262,632	548,866	5,047,023	32,255,012	15,045,594	19,389,727	20,006,804
2021	485,440	262,632	548,866	5,047,023	36,361,217	15,045,594	19,399,026	20,016,889
2022	485,440	262,632	548,866	5,047,022	25,351,973	15,045,594	19,409,488	20,028,236
2023	485,440	262,632	548,866	5,047,023	38,363,568	15,045,594	19,418,788	20,038,322
2024	485,440	262,632	548,866	5,047,023	33,692,630	15,045,594	19,429,250	20,049,669
2025	485,440	262,632	548,866	5,047,023	25,553,360	15,045,594	19,438,549	20,059,755
2026	485,440	262,632	548,866	5,047,023	40,050,068	15,045,594	19,444,362	20,066,059
2027	485,440	262,632	548,866	5,047,023	20,855,788	15,045,594	19,451,336	20,073,623
2028	485,440	262,632	548,866	5,047,023	32,255,012	15,045,594	19,457,148	20,079,927
2029	485,440	262,632	548,866	5,047,023	45,286,670	15,045,594	19,465,286	20,088,753
2030	485,440	262,632	548,866	5,047,023	28,171,919	15,045,594	19,472,260	20,096,317
2031	485,440	262,632	548,866	5,047,023	30,102,595	15,045,594	19,482,722	20,107,664
2032	485,440	262,632	548,866	5,047,023	36,156,721	15,045,594	19,492,021	20,117,750
2033	485,440	262,632	548,866	5,047,022	34,199,127	15,045,594	19,501,321	20,127,836
2034	485,440	262,632	548,866	5,047,023	34,052,649	15,045,594	19,510,621	20,137,922
2035	485,440	262,632	548,866	5,047,023	32,536,604	15,045,594	19,519,920	20,148,008
TOTAL	15,736,913	8,132,128	15,679,055	174,826,622	1,199,422,955	517,382,257	639,670,668	672,127,482

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

(b) Power costs for the period 1968 through 1987 are for an interim facility.

(c) The costs of Del Valle Pumping Plant are combined with those of South Bay Pumping Plant to simplify the cost allocations.

**TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant <sup>a</sup>**

(in dollars)

Sheet 2 of 3

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 16A	Reach 17E	Reach 18A	Reach 22B	Reach 23	Reach 26A	Reach 2B (EBX)	Reach 3A (EBX)
	Chrisman Pumping P.	Edmonston Pumping P.	Alamo Powerplant	Pearblossom Pumping Plant	Mojave Siphon Powerplant	Devil Canyon Powerplant	Greenspot Pumping Plant	Crafton Hills Pumping P.
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	142,902	542,625	0	3,468	0	(3,024)	0	0
1973	387,198	1,548,428	0	202,289	0	(461,268)	0	0
1974	564,464	2,164,223	0	324,993	0	(546,156)	0	0
1975	1,095,331	4,010,395	0	575,061	0	(1,095,523)	0	0
1976	1,506,985	5,443,936	0	889,544	0	(1,566,056)	0	0
1977	652,643	2,345,033	0	315,128	0	(1,222,866)	0	0
1978	1,132,296	4,180,131	0	1,508,115	0	(3,085,094)	0	0
1979	1,526,850	5,475,688	0	1,838,687	0	(3,466,481)	0	0
1980	2,102,439	7,028,235	0	1,762,063	0	(3,318,152)	0	0
1981	2,838,773	9,351,931	0	2,296,771	0	(3,842,971)	0	0
1982	2,424,920	8,352,207	0	1,498,620	0	(2,736,072)	0	0
1983	793,915	2,375,225	0	397,766	0	(5,478,830)	0	0
1984	1,479,784	4,585,198	0	624,213	0	(7,350,989)	0	0
1985	2,812,461	9,365,591	0	1,226,515	0	(10,748,103)	0	0
1986	4,999,949	16,956,023	(1,013,756)	2,359,599	0	(11,484,996)	0	0
1987	4,586,919	15,121,886	(1,064,827)	1,907,854	0	(11,151,140)	0	0
1988	5,284,130	17,342,811	(744,374)	2,375,784	0	(14,495,967)	0	0
1989	8,772,733	29,455,330	(789,392)	4,235,981	0	(18,688,631)	0	0
1990	13,814,150	49,027,449	(841,172)	6,559,548	0	(21,045,321)	0	0
1991	2,535,180	9,033,684	(269,625)	996,352	0	(4,884,013)	0	0
1992	2,907,026	9,754,469	(975,679)	1,225,121	0	(9,782,946)	0	0
1993	(598,008)	(2,721,158)	(58,116)	(260,035)	0	(7,502,549)	0	0
1994	5,941,789	20,657,617	(60,125)	2,644,592	0	(11,998,949)	0	0
1995	1,752,212	5,829,425	(1,324,810)	1,106,460	0	(9,742,248)	0	0
1996	5,050,986	17,658,964	(2,955,178)	2,833,791	(979,429)	(12,358,465)	0	0
1997	5,545,919	19,859,875	(2,572,220)	3,156,995	(1,748,195)	(13,830,356)	0	0
1998	(664,843)	(2,312,472)	(2,016,390)	(443,482)	(1,253,110)	(10,108,555)	0	0
1999	3,616,732	13,967,075	(2,980,122)	1,837,476	(2,587,958)	(15,232,207)	0	0
2000	6,883,712	24,753,968	(5,123,988)	3,622,143	(4,402,610)	(25,758,437)	0	0
2001	35,394,917	129,212,359	(3,383,762)	18,868,242	(3,714,425)	(20,062,834)	0	0
2002	21,173,346	77,461,814	(5,057,760)	10,849,297	(5,371,837)	(25,292,454)	0	0
2003	25,608,686	94,057,399	(3,408,979)	14,580,326	(6,565,620)	(27,777,638)	0	0
2004	30,458,046	111,866,623	(6,431,864)	16,978,585	(7,858,117)	(32,044,505)	78,351	68,735
2005	27,661,065	97,703,918	(5,880,165)	17,372,818	(6,454,740)	(28,818,797)	69,550	48,964
2006	25,878,084	87,353,635	(4,091,143)	16,176,992	(6,391,206)	(34,897,387)	139,168	152,477
2007	40,760,732	140,256,411	(3,029,048)	19,403,658	(5,896,486)	(28,814,592)	270,007	265,495
2008	24,789,469	85,863,671	(3,426,928)	11,285,406	(3,300,797)	(16,968,293)	271,495	347,089
2009	18,305,521	70,547,994	(3,266,008)	8,612,514	(2,288,833)	(13,842,660)	352,859	370,980
2010	25,993,990	95,004,434	(5,115,083)	16,724,894	(5,653,201)	(24,769,829)	328,452	432,929
2011	34,428,676	116,311,249	(6,536,645)	22,865,950	(7,792,422)	(32,285,174)	382,268	495,663
2012	34,364,076	125,336,076	(2,492,869)	19,117,681	(8,905,115)	(23,525,846)	518,376	614,329
2013	47,690,749	164,268,364	(5,159,312)	25,732,240	(10,671,376)	(22,001,420)	427,674	523,480
2014	<b>50,165,599</b>	<b>172,983,514</b>	<b>(7,357,988)</b>	<b>26,222,343</b>	<b>(10,397,504)</b>	<b>(22,018,944)</b>	<b>423,179</b>	<b>528,123</b>
2015	52,043,537	179,570,845	(7,391,508)	27,249,256	(10,519,232)	(22,677,380)	439,270	548,204
2016	45,416,407	166,437,824	(8,201,722)	22,965,587	(9,784,612)	(21,927,345)	432,120	539,282
2017	45,401,638	166,382,890	(8,193,188)	22,806,546	(9,716,852)	(21,927,345)	432,120	539,282
2018	45,620,545	167,284,160	(9,020,282)	25,837,760	(11,008,317)	(24,575,461)	432,120	539,282
2019	45,600,074	167,208,013	(9,016,820)	25,837,760	(11,008,317)	(24,575,462)	432,120	539,282
2020	45,608,847	167,240,648	(9,000,478)	25,837,760	(11,008,317)	(24,575,462)	432,120	539,282
2021	45,632,244	167,327,678	(9,018,857)	25,837,760	(11,008,318)	(24,575,462)	432,120	539,282
2022	45,658,564	167,425,580	(9,018,824)	25,837,760	(11,008,317)	(24,575,462)	432,120	539,282
2023	45,681,961	167,512,606	(9,004,798)	25,837,760	(11,008,317)	(24,575,461)	432,120	539,282
2024	45,708,283	167,610,514	(9,018,713)	25,837,761	(11,008,317)	(24,575,462)	432,120	539,282
2025	45,731,680	167,697,542	(9,018,657)	25,837,761	(11,008,317)	(24,575,462)	432,120	539,282
2026	45,746,304	167,751,931	(9,000,189)	25,837,761	(11,008,318)	(24,575,462)	432,120	539,282
2027	45,763,851	167,817,200	(9,018,545)	25,837,761	(11,008,317)	(24,575,462)	432,120	539,282
2028	45,778,473	167,871,591	(9,018,534)	25,837,760	(11,008,317)	(24,575,462)	432,120	539,282
2029	45,798,946	167,947,745	(9,004,519)	25,837,760	(11,008,317)	(24,575,461)	432,120	539,282
2030	45,816,494	168,013,013	(9,018,412)	25,837,761	(11,008,317)	(24,575,462)	432,120	539,282
2031	45,842,815	168,110,920	(9,018,390)	25,837,760	(11,008,317)	(24,575,462)	432,120	539,282
2032	45,866,213	168,197,944	(8,999,922)	25,837,761	(11,008,317)	(24,575,462)	432,120	539,282
2033	45,889,609	168,284,970	(9,018,345)	25,837,760	(11,008,317)	(24,575,462)	432,120	539,282
2034	45,913,005	168,371,995	(9,018,278)	25,837,760	(11,008,317)	(24,575,462)	432,120	539,282
2035	45,936,402	168,459,022	(9,004,274)	25,837,760	(11,008,317)	(24,575,461)	432,120	539,282
<b>TOTAL</b>	<b>1,499,018,397</b>	<b>5,411,905,884</b>	<b>(273,450,583)</b>	<b>830,513,433</b>	<b>(330,403,385)</b>	<b>(1,105,597,120)</b>	<b>12,343,050</b>	<b>15,182,108</b>

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

**TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant <sup>a</sup>**

(in dollars)

Sheet 3 of 3

Calendar Year	CALIFORNIA AQUEDUCT (continued)						GRAND TOTAL
	Reach 4B (EBX) Cherry Valley Pumping P.	Reach 29A Oso Pumping Plant	Reach 29G Warne Powerplant	Reach 29J Castaic Powerplant	Reach 31A Las Perillas and Badger Hill Pumping Plants	Reach 33A Devil's Den, Bluestone and Polonio Pass Pumping Plants	
	[17]	[18]	[19]	[20]	[21]	[22]	
1961	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	36,771
1963	0	0	0	0	0	0	55,654
1964	0	0	0	0	0	0	73,240
1965	0	0	0	0	0	0	137,665
1966	0	0	0	0	0	0	186,064
1967	0	0	0	0	0	0	231,968
1968	0	0	0	0	118,676	0	1,117,913
1969	0	0	0	0	78,350	0	773,646
1970	0	0	0	0	136,429	0	1,103,798
1971	0	0	0	0	166,296	0	1,476,135
1972	0	79,315	0	(211,144)	212,938	0	3,073,359
1973	0	122,787	0	(1,057,564)	114,897	0	2,934,059
1974	0	157,511	0	(1,547,884)	111,442	0	3,683,880
1975	0	314,636	0	(2,455,461)	88,451	0	5,817,780
1976	0	326,967	0	(2,827,557)	139,279	0	8,211,705
1977	0	75,335	0	(3,734,462)	63,079	0	886,421
1978	0	89,383	0	(1,542,479)	176,153	0	7,272,153
1979	0	102,584	0	(2,776,030)	188,881	0	9,599,576
1980	0	236,768	0	(3,415,486)	168,458	0	10,419,251
1981	0	444,280	0	(2,834,322)	169,177	0	17,563,899
1982	0	539,245	(783,626)	(3,463,971)	168,390	0	13,477,272
1983	0	214,069	(1,488,439)	(6,649,718)	17,920	0	(7,452,864)
1984	0	484,239	(4,088,209)	(4,710,802)	112,679	0	(4,159,491)
1985	0	874,069	(5,930,176)	(15,698,638)	146,843	0	(9,861,182)
1986	0	1,269,590	(5,579,301)	(11,072,448)	297,886	0	11,622,736
1987	0	1,355,533	(6,445,265)	(11,726,458)	245,082	0	6,701,444
1988	0	1,515,349	(7,457,050)	(13,026,992)	214,519	0	6,239,207
1989	0	2,156,915	(8,822,367)	(15,535,849)	282,180	0	24,585,082
1990	0	2,913,030	(11,225,401)	(20,510,539)	416,832	0	48,154,174
1991	0	576,721	(3,882,595)	(6,579,194)	3,610	0	2,462,222
1992	0	829,862	(6,369,339)	(10,976,538)	101,665	0	(5,509,968)
1993	0	70,836	(4,665,393)	(9,531,404)	(111,306)	0	(24,907,973)
1994	0	1,503,796	(7,249,239)	(13,126,331)	206,086	(1,127)	13,499,083
1995	0	247,869	(1,934,202)	(4,049,615)	243,434	0	(142,957)
1996	0	895,929	(4,248,531)	(8,457,232)	296,170	0	15,870,542
1997	0	902,690	(4,824,488)	(8,776,260)	298,483	208,816	14,336,879
1998	0	(67,399)	(1,811,154)	(4,644,120)	(55,491)	(92,902)	(24,405,948)
1999	0	731,865	(5,831,573)	(9,811,777)	166,036	234,077	(3,417,317)
2000	0	1,250,249	(10,161,472)	(17,729,381)	218,543	361,521	(8,452,838)
2001	0	6,480,791	(7,918,467)	(13,370,061)	1,072,998	2,162,821	219,031,010
2002	0	4,246,409	(11,349,183)	(19,513,997)	547,531	1,344,783	94,808,314
2003	0	4,644,398	(10,436,535)	(17,134,431)	638,251	1,539,716	134,863,941
2004	7,271	5,667,657	(12,261,228)	(21,354,179)	673,974	1,799,785	149,122,292
2005	2,568	3,693,925	(7,106,531)	(13,339,416)	852,818	1,738,896	161,427,536
2006	18,724	2,828,104	(7,208,025)	(12,042,760)	834,329	1,487,207	129,430,110
2007	14,439	7,671,084	(11,444,524)	(21,845,299)	1,319,134	2,310,113	217,567,526
2008	10,854	4,984,155	(7,762,363)	(14,997,326)	1,103,802	1,643,974	132,019,786
2009	9,806	4,325,578	(6,997,502)	(16,308,270)	783,563	1,120,587	101,461,556
2010	22,374	3,797,212	(6,643,531)	(11,641,405)	975,414	1,641,985	155,727,543
2011	35,492	3,497,895	(5,996,974)	(10,892,193)	1,240,283	2,544,773	211,411,121
2012	58,412	6,141,184	(8,863,057)	(15,797,149)	1,104,511	1,733,970	204,461,048
2013	89,776	8,560,208	(9,323,896)	(15,957,500)	1,422,118	3,581,244	293,563,200
2014	65,896	9,236,740	(9,883,972)	(16,445,000)	1,501,802	3,692,166	312,749,160
2015	107,800	9,603,463	(10,141,080)	(16,500,000)	1,545,503	3,846,957	323,712,033
2016	0	8,339,104	(10,486,433)	(15,468,996)	612,532	3,646,437	272,356,698
2017	0	8,339,104	(10,488,280)	(15,468,995)	612,532	3,646,437	280,765,139
2018	0	7,333,303	(9,113,728)	(13,583,135)	701,224	4,497,092	266,221,361
2019	0	7,324,336	(9,103,501)	(13,566,322)	701,224	4,497,092	286,024,707
2020	0	7,328,179	(9,108,716)	(13,573,528)	701,224	4,497,092	277,959,749
2021	0	7,338,427	(9,119,573)	(13,592,742)	701,224	4,497,092	282,157,562
2022	0	7,349,956	(9,132,722)	(13,614,359)	701,224	4,497,092	271,271,145
2023	0	7,360,204	(9,144,411)	(13,633,574)	701,224	4,497,092	284,405,921
2024	0	7,371,733	(9,158,393)	(13,655,191)	701,224	4,497,092	279,843,037
2025	0	7,381,981	(9,168,333)	(13,674,405)	701,224	4,497,092	271,814,727
2026	0	7,388,386	(9,175,638)	(13,686,414)	701,224	4,497,092	286,398,123
2027	0	7,395,072	(9,182,571)	(13,700,826)	701,224	4,497,092	267,269,183
2028	0	7,402,476	(9,189,792)	(13,712,835)	701,224	4,497,092	276,736,720
2029	0	7,411,444	(9,197,354)	(13,729,648)	701,224	4,497,092	291,880,578
2030	0	7,419,130	(9,206,121)	(13,744,059)	701,224	4,497,092	274,833,796
2031	0	7,430,659	(9,216,521)	(13,765,676)	701,224	4,497,092	276,890,042
2032	0	7,440,907	(9,226,292)	(13,784,890)	701,224	4,497,092	283,073,707
2033	0	7,451,155	(9,237,148)	(13,804,105)	701,224	4,497,092	281,207,673
2034	0	7,461,402	(9,247,920)	(13,823,320)	701,224	4,497,092	281,171,330
2035	0	7,471,650	(9,256,859)	(13,842,535)	701,224	4,497,092	279,781,193
TOTAL	443,412	255,332,434	(422,314,994)	(733,044,197)	34,665,194	121,139,892	8,558,711,607

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

## Tables B-4 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.



**TABLE B-4 Maximum Contractual Table A Amounts**

(in acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA (a)				CENTRAL COASTAL AREA		
	Napa (b) County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	507	5,248	5,783	11,538	0	0	0
1968	0	0	0	6,900	15,000	88,000	109,900	0	0	0
1969	0	0	0	8,200	15,500	75,000	98,700	0	0	0
1970	0	0	0	10,000	16,200	88,000	114,200	0	0	0
1971	0	0	0	11,200	17,000	88,000	116,200	0	0	0
1972	0	0	0	12,400	17,900	88,000	118,300	0	0	0
1973	0	0	0	13,600	18,800	88,000	120,400	0	0	0
1974	0	0	0	14,800	19,600	88,000	122,400	0	0	0
1975	0	0	0	16,000	20,500	88,000	124,500	0	0	0
1976	0	0	0	17,200	21,300	88,000	126,500	0	0	0
1977	0	0	0	18,400	22,200	88,000	128,600	0	0	0
1978	0	0	0	19,600	23,100	88,000	130,700	0	0	0
1979	0	0	0	20,800	23,900	88,000	132,700	0	0	0
1980	0	500	500	22,000	24,800	88,000	134,800	1,000	946	1,946
1981	0	650	650	23,000	26,000	88,000	137,000	1,000	1,813	2,813
1982	0	800	800	24,000	27,200	88,000	139,200	2,000	3,626	5,626
1983	0	950	950	25,000	28,400	88,000	141,400	3,000	5,439	8,439
1984	0	1,100	1,100	26,000	29,600	88,000	143,600	4,500	8,198	12,698
1985	0	1,250	1,250	27,000	30,800	88,000	145,800	7,500	13,638	21,138
1986	0	1,400	1,400	28,000	32,100	88,000	148,100	10,000	18,210	28,210
1987	0	1,550	1,550	29,000	33,300	88,000	150,300	12,500	22,704	35,204
1988	5,745	9,726	15,471	30,000	34,500	88,000	152,500	15,500	28,222	43,722
1989	6,195	18,420	24,615	31,000	35,700	90,000	156,700	20,000	36,342	56,342
1990	6,940	21,250	28,190	32,000	36,900	92,000	160,900	25,000	45,486	70,486
1991	7,290	22,300	29,590	34,000	38,400	94,000	166,400	25,000	45,486	70,486
1992	7,840	24,170	32,010	36,000	39,900	96,000	171,900	25,000	45,486	70,486
1993	8,490	26,130	34,620	38,000	41,400	98,000	177,400	25,000	45,486	70,486
1994	9,135	28,080	37,215	40,000	42,000	100,000	182,000	25,000	45,486	70,486
1995	9,780	34,250	44,030	42,000	42,000	100,000	184,000	25,000	45,486	70,486
1996	10,425	37,800	48,225	44,000	42,000	100,000	186,000	25,000	45,486	70,486
1997	11,065	38,250	49,315	46,000	42,000	100,000	188,000	6,215	38,986	45,201
1998	11,710	38,710	50,420	46,000	42,000	100,000	188,000	6,215	38,986	45,201
1999	15,850	39,170	55,020	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2000	16,325	39,620	55,945	68,000	42,000	100,000	210,000	25,000	45,486	70,486
2001	20,725	45,836	66,561	78,000	42,000	100,000	220,000	25,000	45,486	70,486
2002	21,100	46,296	67,396	78,000	42,000	100,000	220,000	25,000	45,486	70,486
2003	21,475	46,756	68,231	78,400	42,000	100,000	220,400	25,000	45,486	70,486
2004	21,850	47,206	69,056	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2005	22,225	47,256	69,481	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2006	22,550	47,306	69,856	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2007	22,875	47,356	70,231	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2008	23,200	47,406	70,606	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2009	23,525	47,456	70,981	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2010	29,025	47,506	76,531	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2011	29,025	47,556	76,581	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2012	29,025	47,606	76,631	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2013	29,025	47,656	76,681	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2014	29,025	47,706	76,731	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2015	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2016	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2017	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2018	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2019	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2020	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2021	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2022	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2023	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2024	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2025	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2026	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2027	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2028	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2029	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2030	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2031	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2032	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2033	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2034	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2035	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
<b>TOTAL</b>	<b>1,080,965</b>	<b>2,049,856</b>	<b>3,130,821</b>	<b>3,720,815</b>	<b>2,459,248</b>	<b>6,510,783</b>	<b>12,690,846</b>	<b>1,189,430</b>	<b>2,218,494</b>	<b>3,407,924</b>

(a) Table A Amounts for the South Bay area were supplied by non-Project water for the period June 1962 through November 1967. Actual delivery quantities of Project water are shown for 1967.  
 (b) District's Table A quantities exclude amounts during the period 1968 through 1987 that were supplied by non-Project water.

**TABLE B-4 Maximum Contractual Table A Amounts**

(in acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural	Total				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	14,300	1,000	0	46,600	46,600	900	2,300	12,250	77,350
1969	14,325	3,000	0	95,700	95,700	1,200	2,500	46,350	163,075
1970	15,700	3,000	28,700	116,400	145,100	1,300	2,600	34,300	202,000
1971	17,900	3,000	35,700	154,600	190,300	1,300	2,800	36,500	251,800
1972	20,000	3,000	39,200	231,500	270,700	1,400	5,366	112,600	413,066
1973	22,000	3,000	43,500	267,000	310,500	1,500	3,100	43,552	383,652
1974	33,390	3,000	48,000	299,000	347,000	1,500	3,471	72,289	460,650
1975	40,555	3,000	52,700	358,120	410,820	1,600	3,576	86,258	545,809
1976	30,921	3,000	56,100	386,050	442,150	1,600	4,039	61,707	543,417
1977	30,400	3,000	60,600	423,000	483,600	1,700	3,700	59,000	581,400
1978	32,500	0	64,100	470,200	534,300	1,900	3,900	63,300	635,900
1979	38,544	3,000	67,600	516,300	583,900	2,000	4,000	71,241	702,685
1980	41,000	3,000	71,100	563,400	634,500	2,200	5,700	71,700	758,100
1981	41,000	3,000	74,800	616,600	691,400	2,300	4,300	76,000	818,000
1982	41,000	3,000	79,600	665,700	745,300	2,500	4,500	80,200	876,500
1983	42,900	3,000	83,500	721,600	805,100	2,800	3,770	9,548	867,118
1984	45,100	3,000	103,600	757,000	860,600	3,100	4,800	62,611	979,211
1985	47,200	3,000	108,900	806,100	915,000	3,400	4,900	45,549	1,019,049
1986	49,300	3,000	113,400	820,246	933,646	3,700	5,100	97,200	1,091,946
1987	51,400	3,000	119,100	904,400	1,023,500	4,000	5,200	101,400	1,188,500
1988	53,500	3,000	123,900	950,700	1,074,600	4,000	5,400	105,600	1,246,100
1989	55,600	3,000	128,200	984,100	1,112,300	4,000	5,600	109,900	1,290,400
1990	28,850	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,313,450
1991	53,411	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,338,011
1992	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1993	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1994	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1995	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1996	53,370	3,000	134,600	982,460	1,117,060	4,000	5,700	118,500	1,301,630
1997	53,370	3,000	134,600	978,130	1,112,730	4,000	5,700	118,500	1,297,300
1998	53,370	3,000	134,600	953,130	1,087,730	4,000	5,700	118,500	1,272,300
1999	53,370	3,000	134,600	953,130	1,087,730	4,000	5,700	118,500	1,272,300
2000	53,370	3,000	134,600	886,130	1,020,730	4,000	5,700	118,500	1,205,300
2001	53,370	3,000	134,600	866,349	1,000,949	4,000	5,700	118,500	1,185,519
2002	57,343	3,000	134,600	866,349	1,000,949	4,000	5,700	111,527	1,182,519
2003	57,343	3,000	134,600	866,349	1,000,949	4,000	5,700	111,127	1,182,119
2004	57,343	3,000	134,600	864,130	998,730	9,000	5,700	96,227	1,170,000
2005	57,343	3,000	134,600	864,130	998,730	9,000	5,700	96,227	1,170,000
2006	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2007	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2008	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2009	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2010	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2011	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2012	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2013	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2014	<b>48,350</b>	<b>3,000</b>	<b>134,600</b>	<b>848,130</b>	<b>982,730</b>	<b>9,305</b>	<b>5,700</b>	<b>87,471</b>	<b>1,136,556</b>
2015	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2016	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2017	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2018	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2019	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2020	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2021	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2022	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2023	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2024	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2025	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2026	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2027	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2028	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2029	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2030	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2031	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2032	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2033	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2034	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2035	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
<b>TOTAL</b>	<b>3,008,632</b>	<b>199,000</b>	<b>7,693,900</b>	<b>51,855,303</b>	<b>59,549,203</b>	<b>403,050</b>	<b>352,822</b>	<b>5,959,901</b>	<b>69,472,608</b>

**TABLE B-4 Maximum Contractual Table A Amounts**

(in acre-feet)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	3,700	0	0	0	0	0	0	0	0
1969	0	5,000	0	0	0	0	0	0	0	0
1970	0	5,700	0	0	0	0	0	0	0	0
1971	0	6,700	0	0	0	0	0	0	0	0
1972	20,000	8,936	5,200	526	8,000	170	8,400	1,620	1,677	122
1973	25,000	12,400	5,800	870	9,000	290	10,700	2,940	48,000	11,500
1974	30,000	15,400	6,400	1,160	10,000	400	13,100	4,260	50,000	12,300
1975	35,000	18,200	7,000	1,450	11,000	520	15,400	5,580	52,500	13,100
1976	44,000	21,200	7,600	1,740	12,000	640	17,800	6,900	55,000	14,000
1977	50,000	24,100	8,421	2,030	13,000	730	20,200	8,220	57,500	14,800
1978	57,000	24,762	9,242	2,320	14,000	920	0	9,340	60,000	15,700
1979	63,000	28,000	10,063	2,610	15,000	1,040	24,900	10,260	62,500	16,600
1980	69,200	30,400	10,884	2,900	17,000	1,150	27,200	11,180	65,500	17,400
1981	75,000	32,800	12,105	3,190	19,000	1,270	23,100	11,700	68,500	18,300
1982	81,300	34,800	13,326	3,480	21,000	1,380	22,843	12,320	71,500	19,100
1983	87,700	37,300	14,547	3,770	23,000	1,500	34,300	12,940	74,500	19,900
1984	35,000	39,600	15,768	4,060	25,000	1,610	36,700	13,560	78,000	20,700
1985	40,000	41,800	16,989	4,350	27,000	1,730	39,000	14,180	81,500	21,800
1986	42,000	43,600	18,210	4,640	29,000	1,840	41,400	14,800	85,000	23,200
1987	44,000	45,600	19,431	4,930	31,500	1,960	43,700	15,420	89,000	24,600
1988	46,000	48,000	20,652	5,220	34,000	2,070	46,000	16,040	93,000	26,000
1989	125,700	50,100	21,873	5,510	36,500	2,190	48,500	16,660	97,000	27,400
1990	132,100	52,000	23,100	5,800	38,100	2,300	50,800	17,300	101,500	28,800
1991	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1992	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1993	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1994	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1995	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1996	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1997	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1998	138,400	54,200	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800
1999	138,400	54,200	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800
2000	138,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2001	138,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2002	141,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2003	141,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2004	141,400	95,200	33,000	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2005	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2006	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2007	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2008	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2009	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2010	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2011	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2012	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2013	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2014	144,844	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2015	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2016	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2017	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2018	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2019	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2020	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2021	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2022	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2023	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2024	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2025	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2026	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2027	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2028	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2029	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2030	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2031	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2032	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2033	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2034	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2035	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
<b>TOTAL</b>	<b>7,507,768</b>	<b>4,545,098</b>	<b>4,782,511</b>	<b>321,556</b>	<b>2,626,000</b>	<b>127,210</b>	<b>4,069,043</b>	<b>1,127,720</b>	<b>5,909,177</b>	<b>1,641,322</b>

**TABLE B-4 Maximum Contractual Table A Amounts**

(in acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	11,538
1968	0	0	0	3,700	0	300	250	550	0	191,500
1969	0	0	0	5,000	0	350	270	620	0	267,395
1970	0	0	0	5,700	0	400	300	700	0	322,600
1971	0	0	0	6,700	0	450	440	890	0	375,590
1972	0	154,772	0	209,423	0	500	470	970	0	741,759
1973	0	354,600	0	481,100	0	600	500	1,100	0	986,252
1974	0	454,900	0	597,920	0	700	530	1,230	0	1,182,200
1975	0	555,200	0	714,950	0	1,050	560	1,610	0	1,386,869
1976	0	655,600	0	836,480	0	1,400	590	1,990	0	1,508,387
1977	0	755,900	0	954,901	0	1,800	620	2,420	0	1,667,321
1978	0	856,300	0	1,049,584	0	1,200	650	1,850	0	1,818,034
1979	0	956,600	0	1,190,573	0	1,450	680	2,130	0	2,028,088
1980	6,800	1,057,000	1,000	1,317,614	0	1,100	710	1,810	0	2,214,770
1981	7,800	1,157,300	2,000	1,432,065	0	1,200	740	1,940	0	2,392,468
1982	8,800	1,257,600	3,000	1,550,449	0	1,200	770	1,970	0	2,574,545
1983	9,800	1,358,000	4,000	1,681,257	0	1,200	800	2,000	0	2,701,164
1984	10,800	1,458,300	5,000	1,744,098	1,600	1,200	830	3,630	0	2,884,337
1985	11,800	1,558,700	6,000	1,864,849	1,700	1,200	860	3,760	0	3,055,846
1986	12,900	1,659,300	8,000	1,983,890	2,100	1,200	890	4,190	0	3,257,736
1987	14,000	1,759,800	10,000	2,103,941	2,500	1,200	920	4,620	0	3,484,115
1988	15,100	1,860,400	13,000	2,225,482	2,900	1,200	960	5,060	0	3,688,335
1989	16,200	1,961,000	16,000	2,424,633	3,300	1,200	1,000	5,500	0	3,958,190
1990	17,300	2,011,500	20,000	2,500,600	3,800	1,200	1,040	6,040	0	4,079,666
1991	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,080	11,880	0	4,126,567
1992	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,120	11,920	0	4,138,816
1993	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,160	11,960	0	4,146,966
1994	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,200	12,000	0	4,154,201
1995	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,250	12,050	0	4,163,066
1996	0	2,011,500	20,000	2,492,900	9,600	1,200	1,300	12,100	0	4,111,341
1997	0	2,011,500	20,000	2,492,900	9,600	1,200	1,350	12,150	0	4,084,866
1998	0	2,011,500	20,000	2,517,900	9,600	1,200	1,400	12,200	0	4,086,021
1999	2,000	2,011,500	20,000	2,519,900	9,600	2,890	1,450	13,940	0	4,119,646
2000	3,000	2,011,500	20,000	2,565,900	9,600	2,890	1,510	14,000	0	4,121,631
2001	4,000	2,011,500	20,000	2,566,900	9,600	3,500	1,570	14,670	0	4,124,136
2002	4,000	2,011,500	20,000	2,569,900	9,600	3,500	1,630	14,730	0	4,125,031
2003	5,000	2,011,500	20,000	2,570,900	9,600	3,500	1,690	14,790	0	4,126,926
2004	6,000	2,011,500	20,000	2,581,800	9,600	3,500	0	13,100	0	4,127,061
2005	6,500	1,911,500	20,000	2,582,300	9,600	1,200	0	10,800	0	4,125,686
2006	7,000	1,911,500	20,000	2,582,800	9,600	1,200	324	11,124	0	4,126,885
2007	8,650	1,911,500	20,000	2,584,450	9,600	1,200	720	11,520	0	4,129,306
2008	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,020	39,120	0	4,165,931
2009	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,090	39,190	0	4,166,376
2010	17,300	1,911,500	20,000	2,623,100	9,600	1,731	2,160	13,491	0	4,146,227
2011	17,300	1,911,500	20,000	2,623,100	9,600	2,548	2,240	14,388	0	4,147,174
2012	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,320	39,420	0	4,172,256
2013	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,410	39,510	0	4,172,396
2014	17,300	1,911,500	20,000	2,626,544	9,600	27,500	2,500	39,600	0	4,172,536
2015	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,600	39,700	0	4,172,686
2016	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2017	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2018	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2019	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2020	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2021	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2022	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2023	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2024	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2025	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2026	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2027	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2028	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2029	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2030	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2031	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2032	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2033	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2034	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2035	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
<b>TOTAL</b>	<b>748,350</b>	<b>109,260,272</b>	<b>988,000</b>	<b>143,654,027</b>	<b>449,900</b>	<b>775,559</b>	<b>106,474</b>	<b>1,331,933</b>	<b>0</b>	<b>233,688,159</b>

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 1 of 17

Calendar Year	UPPER FEATHER AREA			NORTH BAY AQUEDUCT							Total
	BUTTE	Grizzly Valley	YUBA	Reach 1	Reach 3A		Reach 3A-T		Reach 3B		
		Pipeline PC FC&WCD		SCWA	NC FC&WCD	SCWA	NC FC&WCD	SCWA	NC (a) FC&WCD	SCWA	
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	1,214	0	1,214
1969	0	0	0	0	0	0	0	0	2,687	0	2,687
1970	0	70	0	0	0	0	0	0	3,618	0	3,618
1971	192	64	0	0	0	0	0	0	2,521	0	2,521
1972	186	505	0	0	0	0	0	0	3,647	0	3,647
1973	53	679	0	0	0	0	0	0	3,792	0	3,792
1974	127	648	0	0	0	0	0	0	4,870	0	4,870
1975	253	405	0	0	0	0	0	0	6,840	0	6,840
1976	527	382	0	0	0	0	0	0	7,122	0	7,122
1977	706	303	0	0	0	0	0	0	8,226	0	8,226
1978	579	278	0	0	0	0	0	0	6,034	0	6,034
1979	302	329	0	0	0	0	0	0	6,561	0	6,561
1980	267	295	0	0	0	0	0	0	6,707	0	6,707
1981	221	355	0	0	0	0	0	0	9,001	0	9,001
1982	334	305	0	0	0	0	0	0	1,213	0	1,213
1983	325	262	0	0	0	0	0	0	2,287	0	2,287
1984	177	272	108	0	0	0	0	0	2,923	0	2,923
1985	308	254	62	0	0	0	0	0	4,039	0	4,039
1986	313	317	328	1,400	0	0	0	0	3,519	0	4,919
1987	459	452	88	1,550	0	0	0	0	7,693	0	9,243
1988	385	523	303	1	0	9,725	0	0	5,392	0	15,118
1989	300	486	403	10	0	17,246	0	0	6,195	0	23,451
1990	380	548	494	3,275	0	15,856	0	0	6,940	0	26,071
1991	328	420	265	3,117	0	3,855	0	0	1,380	0	8,352
1992	117	485	642	5,553	0	9,220	0	0	4,001	0	18,774
1993	256	444	746	14,709	0	14,471	0	0	5,286	0	34,466
1994	329	492	1,035	10,343	0	14,913	0	0	6,792	0	32,048
1995	203	308	910	5,452	0	15,893	0	0	5,182	0	26,527
1996	257	360	820	12,930	0	17,069	0	0	4,893	0	34,892
1997	185	231	1,005	16,029	0	17,501	0	0	4,341	0	37,871
1998	527	0	1,054	11,562	0	18,204	0	0	5,359	0	35,125
1999	286	0	1,096	15,191	0	19,562	0	0	5,304	0	40,057
2000	586	0	901	15,490	0	11,290	0	10,235	4,958	0	41,973
2001	513	0	1,065	14,849	0	11,377	0	8,360	9,345	0	43,931
2002	419	0	1,181	18,841	0	11,130	0	8,589	6,875	0	45,435
2003	551	0	1,324	17,260	0	9,682	9	7,009	7,637	0	41,597
2004	1,440	0	1,434	20,951	0	10,691	135	10,860	7,999	500	51,136
2005	527	0	1,894	18,290	0	10,585	160	8,444	7,509	500	45,488
2006	468	0	5,342	16,573	0	10,865	208	7,578	7,581	500	43,305
2007	956	0	2,327	19,187	0	12,301	180	15,312	10,777	500	58,257
2008	451	243	1,923	21,436	15	11,410	37	7,974	13,240	500	54,612
2009	581	200	2,114	15,004	0	8,651	27	6,795	10,877	500	41,854
2010	807	243	2,331	17,598	0	8,231	70	4,487	12,347	500	43,233
2011	1,092	98	2,297	15,202	0	7,761	39	5,032	11,275	0	39,309
2012	1,374	79	2,695	16,508	0	8,298	0	4,588	9,860	0	39,254
2013	764	665	4,630	12,957	0	6,673	0	8,569	15,344	0	43,543
2014	1,600	1,500	5,760	22,071	0	6,130	0	0	17,415	0	45,616
2015	1,600	1,562	5,760	15,600	0	13,054	0	0	17,415	0	46,069
2016	1,600	1,619	5,760	16,083	0	12,571	0	0	17,415	0	46,069
2017	1,600	1,619	5,760	16,100	0	12,554	0	0	17,415	0	46,069
2018	1,736	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2019	1,786	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2020	1,846	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2021	1,911	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2022	1,982	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2023	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2024	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2025	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2026	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2027	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2028	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2029	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2030	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2031	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2032	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2033	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2034	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2035	2,143	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
<b>TOTAL</b>	<b>61,947</b>	<b>47,442</b>	<b>167,537</b>	<b>698,996</b>	<b>15</b>	<b>584,667</b>	<b>865</b>	<b>113,832</b>	<b>674,333</b>	<b>3,500</b>	<b>2,076,208</b>

(a) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility.



**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 2 of 17

Calendar Year	SOUTH BAY AQUEDUCT (b)											Total
	Reach 1		Reach 2	Reach 4	Reach 5		Reach 6	Reach 7	Reach 8	Reach 9	Total	
	AC FC&WCD	ACWD	AC FC&WCD	AC FC&WCD	AC FC&WCD	ACWD	AC FC&WCD	ACWD	ACWD	SCVWD		
[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]		
1962	141	8,412	353	0	0	0	0	0	0	0	8,906	
1963	814	10,914	917	0	0	0	0	0	0	0	12,645	
1964	248	19,238	1,425	0	0	0	0	0	0	0	20,911	
1965	637	15,280	1,830	138	0	0	0	1,127	0	15,014	34,026	
1966	2,475	0	2,537	499	0	0	0	14,864	0	34,538	54,913	
1967	1,527	0	2,391	862	0	0	0	12,882	0	39,101	56,763	
1968	1,608	0	3,799	721	5	0	0	24,817	0	70,105	101,055	
1969	1,165	0	3,459	1,851	160	0	0	813	0	62,264	69,712	
1970	1,345	0	4,558	3,182	164	0	0	0	0	80,311	89,560	
1971	546	0	1,908	2,403	160	0	0	5,961	0	87,606	98,584	
1972	1,066	0	4,605	2,041	2,777	1,489	0	26,182	0	100,266	138,426	
1973	430	0	1,123	1,193	229	0	0	2,521	0	88,582	94,078	
1974	177	0	0	975	162	0	0	0	4	88,000	89,318	
1975	137	0	1,783	1,864	120	0	714	393	593	88,000	93,604	
1976	265	0	7,204	3,384	817	0	5,461	13,774	7,526	88,000	126,431	
1977	210	0	4,491	2,213	524	0	5,206	11,284	7,556	76,220	107,704	
1978	422	0	2,426	3,754	2,034	0	2,348	854	5,009	95,727	112,574	
1979	197	0	4,283	5,567	3,937	0	5,341	3,430	7,444	91,991	122,190	
1980	77	0	3,883	6,686	0	1,508	6,144	2,824	6,702	88,000	115,824	
1981	1,250	0	4,648	5,273	1,157	5,752	7,262	7,595	8,570	88,000	129,507	
1982	473	0	3,043	4,406	630	0	4,571	1,776	4,540	88,000	107,439	
1983	179	0	2,712	1,714	50	0	111	0	3,157	86,733	94,656	
1984	165	0	4,219	2,219	55	0	126	0	3,338	88,000	98,122	
1985	213	0	5,199	2,060	63	0	7,537	11,203	7,813	88,000	122,088	
1986	200	0	6,052	2,062	212	0	2,083	5,311	7,068	88,000	110,988	
1987	218	0	7,538	2,372	285	0	12,993	15,488	9,902	88,000	136,796	
1988	222	0	8,302	4,681	189	0	12,436	24,259	9,205	87,961	147,255	
1989	222	0	8,051	6,562	418	0	10,974	17,340	8,702	90,000	142,269	
1990	256	0	8,160	8,347	593	0	15,678	22,149	9,554	91,800	156,537	
1991	162	0	3,676	3,269	359	0	1,945	9,155	3,493	28,200	50,259	
1992	217	0	5,177	2,188	154	0	6,933	12,621	6,532	42,839	76,661	
1993	190	0	5,843	8,430	5,964	1,650	13,208	1,792	6,829	62,065	105,971	
1994	132	0	4,482	5,427	822	0	9,679	3,379	19,532	57,115	100,568	
1995	278	0	6,236	7,195	955	0	15,427	21	17,772	28,756	76,640	
1996	277	0	6,151	5,119	388	0	6,968	1,871	11,591	44,850	77,215	
1997	138	0	6,647	6,501	1,582	1,323	12,654	1,876	10,864	60,601	102,186	
1998	106	0	3,748	2,493	1,277	0	8,347	3,817	11,478	39,610	70,876	
1999	148	0	5,048	8,227	1,444	0	13,133	5,326	16,226	52,945	102,497	
2000	110	0	7,464	9,761	946	0	16,396	4,498	18,100	78,258	135,533	
2001	105	0	7,822	4,879	3,010	0	13,593	0	18,004	47,922	95,335	
2002	93	0	7,758	11,619	2,446	0	17,058	5,112	20,616	58,875	123,577	
2003	108	0	7,916	11,348	2,887	0	16,884	5,037	12,753	75,981	132,714	
2004	72	0	11,754	9,737	3,763	0	21,260	4,968	14,916	59,458	125,928	
2005	1,430	0	11,520	10,100	1,826	0	16,597	4,139	10,160	52,364	108,136	
2006	830	0	11,546	4,097	2,123	0	19,870	2,708	12,924	64,174	118,272	
2007	179	0	10,066	2,563	3,107	0	23,205	8,255	15,107	71,690	134,172	
2008	238	0	11,424	2,206	1,899	0	25,363	4,421	18,481	52,530	116,562	
2009	211	0	7,054	5,437	1,987	0	16,398	2,551	16,945	66,364	116,947	
2010	160	0	7,788	7,528	1,824	0	17,043	330	15,241	45,888	95,802	
2011	1,541	0	6,282	6,887	2,173	0	20,098	7	15,203	60,761	112,952	
2012	262	0	7,598	9,987	2,972	0	14,112	0	13,331	63,794	112,056	
2013	274	0	12,872	10,002	2,921	0	20,812	3,625	18,110	75,339	143,955	
2014	236	0	6,000	9,252	2,120	0	20,763	4,000	18,514	60,000	120,885	
2015	236	0	6,000	9,052	2,120	0	30,963	4,000	19,638	60,000	132,009	
2016	236	0	6,100	16,152	2,120	0	23,763	4,000	19,638	60,000	132,009	
2017	236	0	2,650	16,652	2,120	0	26,713	4,000	19,638	60,000	132,009	
2018	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2019	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2020	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2021	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2022	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2023	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2024	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2025	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2026	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2027	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2028	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2029	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2030	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2031	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2032	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2033	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2034	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
2035	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571	
TOTAL	33,370	53,844	584,721	436,137	137,910	11,722	912,308	431,478	858,797	4,688,598	8,148,885	

(b) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 3 of 17

Calendar Year	CALIFORNIA AQUEDUCT									
	NORTH SAN JOAQUIN DIVISION						SAN LUIS DIVISION			
	Reach 1	Reach 2A					Reach 3		Reach 3A	
	KCWA	AC	KCWA							
(AG)	FC&WCD	(AG)	OFWD (c)	SCVWD	TLBWSD	DRWD	MWDSC	AVEK	CLWA	
	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	3,084	0	0	0	0	0	0
1969	0	0	0	3,016	0	0	0	0	0	0
1970	0	0	0	5,911	0	0	0	0	0	0
1971	0	0	0	7,212	0	0	0	0	0	0
1972	0	0	0	8,166	0	0	0	0	0	0
1973	0	0	0	3,214	0	0	0	0	0	0
1974	0	0	0	3,471	0	0	0	0	0	0
1975	0	0	0	3,576	0	0	0	0	0	0
1976	0	0	0	4,112	0	0	0	0	0	0
1977	0	0	0	1,472	0	0	0	0	0	0
1978	0	0	0	3,906	0	0	0	0	0	0
1979	0	0	0	6,149	0	0	0	0	0	0
1980	0	0	0	5,700	0	0	0	0	0	0
1981	0	0	0	4,300	0	0	0	0	0	0
1982	0	0	0	3,838	0	0	0	0	0	0
1983	0	0	0	3,822	0	0	0	0	0	0
1984	0	0	0	5,700	0	0	0	0	0	0
1985	0	0	0	5,433	0	0	0	0	0	0
1986	0	0	0	5,107	0	0	0	0	0	0
1987	0	0	0	5,625	0	0	0	0	0	0
1988	0	0	0	4,412	0	0	0	0	0	0
1989	0	0	0	6,091	0	300	602	0	0	0
1990	0	0	0	2,922	200	0	0	0	0	0
1991	0	0	0	141	0	0	0	0	0	0
1992	0	0	0	2,239	0	0	0	0	0	0
1993	0	0	0	2,858	0	0	0	0	0	0
1994	0	0	0	3,071	0	0	0	0	0	0
1995	0	0	0	5,169	0	0	0	0	0	0
1996	0	0	0	4,904	0	0	0	0	0	0
1997	0	0	0	5,238	0	0	0	0	0	0
1998	0	0	0	4,401	0	0	0	11,100	0	0
1999	0	0	0	4,871	0	0	0	(11,100)	0	0
2000	0	0	0	4,508	0	0	0	0	0	0
2001	0	0	638	3,592	0	0	0	0	0	0
2002	0	0	773	4,885	0	0	0	0	0	0
2003	0	7	917	4,266	0	0	0	0	0	0
2004	0	38	786	4,629	0	0	0	0	0	0
2005	0	299	1,046	4,194	0	0	0	0	0	0
2006	0	321	1,103	4,242	0	0	0	0	0	0
2007	0	320	1,031	3,567	0	0	0	0	0	0
2008	8,885	56	1,744	1,985	0	0	0	0	5,873	0
2009	0	0	1,169	1,993	0	0	0	0	0	3,300
2010	0	0	1,124	2,906	0	0	0	0	0	0
2011	0	0	1,112	2,715	0	0	0	0	0	0
2012	0	0	1,258	3,208	0	0	0	0	0	0
2013	0	0	1,328	2,574	0	0	0	0	0	0
2014	0	0	1,300	3,420	0	0	0	0	0	0
2015	0	0	1,300	3,420	0	0	0	0	0	0
2016	0	0	1,300	3,420	0	0	0	0	0	0
2017	0	0	1,300	3,420	0	0	0	0	0	0
2018	0	0	1,171	3,420	0	0	0	0	0	0
2019	0	0	1,171	3,420	0	0	0	0	0	0
2020	0	0	1,171	3,420	0	0	0	0	0	0
2021	0	0	1,171	3,420	0	0	0	0	0	0
2022	0	0	1,171	3,420	0	0	0	0	0	0
2023	0	0	1,171	3,420	0	0	0	0	0	0
2024	0	0	1,171	3,420	0	0	0	0	0	0
2025	0	0	1,171	3,420	0	0	0	0	0	0
2026	0	0	1,171	3,420	0	0	0	0	0	0
2027	0	0	1,171	3,420	0	0	0	0	0	0
2028	0	0	1,171	3,420	0	0	0	0	0	0
2029	0	0	1,171	3,420	0	0	0	0	0	0
2030	0	0	1,171	3,420	0	0	0	0	0	0
2031	0	0	1,171	3,420	0	0	0	0	0	0
2032	0	0	1,171	3,420	0	0	0	0	0	0
2033	0	0	1,171	3,420	0	0	0	0	0	0
2034	0	0	1,171	3,420	0	0	0	0	0	0
2035	0	0	1,171	3,420	0	0	0	0	0	0
TOTAL	8,885	1,041	40,307	263,635	200	300	602	0	5,873	3,300

(c) Includes 425 AF of 1988 advance allocation and 141 AF of 1992 advance allocation.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 4 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	SAN LUIS DIVISION (continued)										
	Reach 3A					Reach 4				Reach 5	
	DRWD	KCWA		MWDSC	SCVWD	TLWSD	DRWD	KCWA		TLBWSD	CLWA
(M&I)		(AG)	(M&I)					(AG)			
[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	
1962	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	0	
1972	0	0	0	0	0	0	0	0	0	0	
1973	0	0	0	0	0	0	0	0	0	0	
1974	0	0	0	0	0	0	0	0	0	0	
1975	0	0	0	0	0	0	0	0	0	0	
1976	0	0	0	0	0	0	0	0	0	0	
1977	0	0	0	0	0	0	0	0	0	0	
1978	0	0	0	0	0	0	0	0	0	0	
1979	0	0	0	0	0	0	0	0	0	0	
1980	0	0	0	0	0	0	0	0	0	0	
1981	0	0	0	0	0	0	0	0	0	0	
1982	0	0	0	0	0	0	0	0	0	0	
1983	0	0	0	0	0	0	0	0	0	0	
1984	0	0	0	0	0	0	0	0	0	0	
1985	0	0	0	0	0	0	0	0	0	0	
1986	0	0	0	0	0	0	0	0	0	0	
1987	0	0	0	0	0	0	0	0	0	0	
1988	0	0	0	0	0	0	0	0	0	0	
1989	0	0	0	0	0	1,898	0	12,647	0	0	
1990	0	0	0	0	0	0	0	0	1,500	0	
1991	0	0	0	0	0	0	0	0	0	0	
1992	0	0	0	0	0	0	0	0	0	0	
1993	0	0	0	0	0	0	0	0	0	5,095	
1994	0	0	0	0	0	0	0	0	0	0	
1995	0	0	0	0	0	14,446	0	3,500	0	0	
1996	0	0	0	0	0	0	1,125	4,162	0	0	
1997	0	0	0	0	0	0	0	0	0	0	
1998	0	0	0	0	0	0	0	0	0	0	
1999	0	0	0	0	0	0	0	0	1,300	0	
2000	0	3,320	68,960	0	0	0	1,517	878	0	0	
2001	0	0	140,242	0	30,000	0	0	0	0	0	
2002	0	6,000	62,024	0	0	0	0	0	0	0	
2003	0	0	151,044	29,596	0	0	0	1,351	0	0	
2004	0	0	44,877	0	0	0	0	0	0	0	
2005	0	0	109,712	50,000	8,804	277	0	7,000	0	0	
2006	0	0	19,575	0	0	0	0	0	0	0	
2007	0	71,567	116,272	0	0	0	0	0	0	0	
2008	0	0	94,562	0	0	0	0	10,721	0	0	
2009	0	0	158,590	52,933	9,999	0	0	0	0	0	
2010	0	0	35,896	120,274	9,993	0	0	0	0	0	
2011	0	0	0	78,324	0	0	0	0	0	0	
2012	6,068	0	23,401	0	0	0	0	0	0	0	
2013	0	0	5,186	0	0	0	0	0	0	0	
2014	0	0	0	0	0	0	0	0	0	0	
2015	0	0	0	0	0	0	0	0	0	0	
2016	0	0	0	0	0	0	0	0	0	0	
2017	0	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	0	
<b>TOTAL</b>	6,068	80,887	1,030,341	331,127	58,796	277	16,344	2,642	40,259	2,800	5,095

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 5 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)							SOUTH SAN JOAQUIN DIVISION				
	Reach 5							Reach 6				
	DRWD	EWSID	KCWA		MWDSC	OFWD	TLBWS	EWSID	KCWA		CK	MWDSC
(M&I)			(AG)	(M&I)					(AG)			
	[44]	[45]	[46]	[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	1,550	0	0	0	0	0
1989	0	0	0	18,831	0	0	0	0	0	8,260	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
1992	10,823	0	0	0	0	0	0	0	0	0	0	0
1993	27,200	0	0	28,200	0	2,000	1,624	0	0	31,200	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	21,776	0	0	0	0	0	3,932	0	0
1996	0	0	1,125	81,507	0	0	4,000	0	0	0	0	0
1997	0	0	9,080	154,940	0	0	3,500	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	20,400	33,340	0	0
1999	0	0	0	0	21,500	0	8,000	0	0	33,776	0	11,000
2000	0	0	8,130	57,647	0	0	0	0	1,457	35,847	0	0
2001	0	0	0	0	0	0	2,457	0	0	0	0	0
2002	0	0	0	0	0	0	3,000	0	0	0	0	0
2003	0	0	0	0	0	0	3,900	0	0	0	0	0
2004	0	0	0	0	0	0	3,850	0	0	0	3,250	0
2005	0	0	0	0	0	0	1,000	0	0	0	6,954	0
2006	0	0	0	0	0	0	3,000	0	0	0	2,659	0
2007	0	0	0	0	0	0	3,600	0	0	0	3,119	0
2008	0	0	0	0	0	0	1,355	0	0	0	2,159	0
2009	0	870	0	0	0	0	1,490	0	0	0	1,779	0
2010	0	431	0	0	0	0	0	0	0	0	2,477	0
2011	0	0	0	0	0	0	0	400	0	0	2,964	0
2012	0	449	0	0	0	0	0	514	0	0	2,857	0
2013	0	0	0	0	0	0	0	0	0	0	2,371	0
2014	0	0	0	0	0	0	0	0	0	0	3,120	0
2015	0	0	0	0	0	0	0	0	0	0	3,120	0
2016	0	0	0	0	0	0	0	0	0	0	3,120	0
2017	0	0	0	0	0	0	0	0	0	0	3,120	0
2018	0	0	0	0	0	0	0	0	0	0	3,120	0
2019	0	0	0	0	0	0	0	0	0	0	3,120	0
2020	0	0	0	0	0	0	0	0	0	0	3,120	0
2021	0	0	0	0	0	0	0	0	0	0	3,120	0
2022	0	0	0	0	0	0	0	0	0	0	3,120	0
2023	0	0	0	0	0	0	0	0	0	0	3,120	0
2024	0	0	0	0	0	0	0	0	0	0	3,120	0
2025	0	0	0	0	0	0	0	0	0	0	3,120	0
2026	0	0	0	0	0	0	0	0	0	0	3,120	0
2027	0	0	0	0	0	0	0	0	0	0	3,120	0
2028	0	0	0	0	0	0	0	0	0	0	3,120	0
2029	0	0	0	0	0	0	0	0	0	0	3,120	0
2030	0	0	0	0	0	0	0	0	0	0	3,120	0
2031	0	0	0	0	0	0	0	0	0	0	3,120	0
2032	0	0	0	0	0	0	0	0	0	0	3,120	0
2033	0	0	0	0	0	0	0	0	0	0	3,120	0
2034	0	0	0	0	0	0	0	0	0	0	3,120	0
2035	0	0	0	0	0	0	0	0	0	0	3,120	0
TOTAL	38,023	1,750	18,335	362,901	21,500	2,000	42,326	914	21,857	146,355	99,229	11,000

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 6 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 6	Reach 7						Reach 8C				
	TLBWSD	CLWA	DRWD	KCWA		CK	MWDSC	TLBWSD	DRWD	EWSID	KCWA	
(M&I)				(AG)	(M&I)						(AG)	
	[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[64]	[65]	[66]	[67]
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	1,978	0	0
1969	0	0	0	0	0	0	0	0	0	56	0	0
1970	0	0	0	0	0	0	0	0	0	3,942	0	0
1971	0	0	0	0	0	0	0	0	0	5,990	0	0
1972	0	0	0	0	0	0	0	0	0	5,795	0	0
1973	0	0	0	0	0	0	0	0	0	3,000	0	0
1974	0	0	0	0	0	0	0	0	0	3,000	0	0
1975	0	0	0	0	0	0	0	0	0	3,000	0	0
1976	0	0	0	0	0	0	0	0	0	3,000	0	0
1977	0	0	0	0	0	0	0	0	0	738	0	0
1978	0	0	0	0	0	0	0	0	0	454	0	0
1979	0	0	0	0	0	0	0	0	0	1,739	0	0
1980	0	0	0	0	0	0	0	0	0	894	0	0
1981	0	0	0	0	0	0	0	0	0	5,859	0	0
1982	0	0	0	0	0	0	0	0	0	361	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	5,197	0	0
1986	0	0	0	0	0	0	0	0	0	1,170	0	0
1987	0	0	0	0	0	0	0	0	0	2,525	0	0
1988	0	0	0	0	0	0	0	0	0	3,475	0	0
1989	0	0	0	0	5,262	0	0	0	2,391	3,000	0	0
1990	0	0	0	0	0	0	0	0	0	1,279	0	0
1991	0	0	0	0	0	0	0	0	0	221	0	0
1992	0	0	0	0	0	0	0	0	280	1,354	0	0
1993	0	0	0	18,157	10,043	0	0	0	0	2,741	0	0
1994	0	2,100	0	0	0	0	0	0	0	1,666	0	0
1995	0	0	0	10,875	20,595	0	0	0	0	1,631	989	10,527
1996	0	0	0	3,424	69,704	0	0	0	95	1,868	0	1,500
1997	0	0	0	27,079	32,463	0	0	0	0	0	0	1,500
1998	3,000	0	200	3,998	62,081	0	0	0	90	542	0	1,000
1999	23,000	0	0	7,923	19,500	0	500	4,470	86	3,176	0	400
2000	3,000	1,200	0	0	45,137	0	20,000	20,500	166	1,799	0	400
2001	600	0	0	0	0	0	0	0	14	1,360	0	0
2002	0	0	0	0	0	0	0	12,067	0	1,405	0	0
2003	0	0	0	0	0	0	0	15,103	0	1,436	0	0
2004	0	0	0	0	0	0	0	0	0	3,562	0	0
2005	0	0	0	0	0	6,904	0	4,000	0	3,834	0	0
2006	0	0	0	0	0	2,500	0	6,000	0	3,282	0	0
2007	0	0	0	0	16,214	0	0	2,545	0	2,084	0	0
2008	0	0	400	0	1,998	1,330	0	1,500	0	947	0	0
2009	2,100	0	1,400	0	0	0	0	600	0	164	0	0
2010	0	0	0	0	0	0	0	3,850	0	2,828	0	0
2011	0	0	0	0	0	0	0	2,500	0	1,515	0	0
2012	1,000	0	0	0	0	2,000	0	2,300	0	1,279	0	0
2013	1,000	0	0	0	0	0	0	1,100	0	1,532	0	0
2014	0	0	0	0	0	0	0	0	0	1,800	0	0
2015	0	0	0	0	0	0	0	0	0	1,800	0	0
2016	0	0	0	0	0	0	0	0	0	1,800	0	0
2017	0	0	0	0	0	0	0	0	0	1,800	0	0
2018	0	0	0	0	0	0	0	0	0	1,800	0	0
2019	0	0	0	0	0	0	0	0	0	1,800	0	0
2020	0	0	0	0	0	0	0	0	0	1,800	0	0
2021	0	0	0	0	0	0	0	0	0	1,800	0	0
2022	0	0	0	0	0	0	0	0	0	1,800	0	0
2023	0	0	0	0	0	0	0	0	0	1,800	0	0
2024	0	0	0	0	0	0	0	0	0	1,800	0	0
2025	0	0	0	0	0	0	0	0	0	1,800	0	0
2026	0	0	0	0	0	0	0	0	0	1,800	0	0
2027	0	0	0	0	0	0	0	0	0	1,800	0	0
2028	0	0	0	0	0	0	0	0	0	1,800	0	0
2029	0	0	0	0	0	0	0	0	0	1,800	0	0
2030	0	0	0	0	0	0	0	0	0	1,800	0	0
2031	0	0	0	0	0	0	0	0	0	1,800	0	0
2032	0	0	0	0	0	0	0	0	0	1,800	0	0
2033	0	0	0	0	0	0	0	0	0	1,800	0	0
2034	0	0	0	0	0	0	0	0	0	1,800	0	0
2035	0	0	0	0	0	0	0	0	0	1,800	0	0
TOTAL	33,700	3,300	2,000	71,456	282,997	12,734	20,500	76,535	3,122	136,278	989	15,327



**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 7 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN DIVISION (continued)									
	Reach 8C		Reach 8D						Reach 9	
	CK	TLBWS	AVEKWA	DRWD	KCWA		CK	SLOC FC&WCD	TLBWS	DRWD
(M&I)					(AG)					
	[68]	[69]	[70]	[71]	[72]	[73]	[74]	[75]	[76]	[77]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	900	25,100	0	26,360	0	0	0	0	0	0
1969	100	7,081	0	31,375	0	0	0	0	0	0
1970	0	0	0	40,407	0	0	0	0	3,408	0
1971	3,700	80,906	0	41,053	0	0	0	0	41,579	0
1972	1,400	144,843	0	42,443	0	0	0	0	113,550	0
1973	1,500	26,317	0	22,057	0	1,500	0	0	24,147	0
1974	1,500	32,603	0	33,390	0	0	0	0	39,686	0
1975	1,600	41,536	0	40,555	0	0	0	0	44,722	0
1976	1,600	26,595	0	41,421	0	0	0	0	32,216	0
1977	1,530	12,984	0	11,153	0	0	0	0	5,097	0
1978	2,070	3,934	0	51,747	0	0	0	0	8,119	0
1979	2,000	74,758	0	38,544	0	0	0	0	80,363	0
1980	2,200	35,140	0	41,000	0	0	0	0	40,304	0
1981	2,300	50,888	0	41,000	0	0	0	0	32,550	0
1982	1,536	4,405	0	41,000	0	0	214	0	14,146	0
1983	3,550	1,001	0	42,900	0	0	0	0	5	0
1984	3,100	3,677	0	45,100	0	0	0	0	2,066	0
1985	3,400	68,638	0	46,251	0	0	0	0	41,153	0
1986	3,700	40,017	0	50,249	0	0	0	0	39,338	0
1987	4,000	30,359	0	46,288	0	0	0	0	62,725	0
1988	4,000	46,281	0	47,994	0	0	0	0	48,035	0
1989	4,000	63,703	0	52,158	0	0	0	0	63,947	0
1990	2,000	23,504	0	36,296	0	161	0	0	32,066	0
1991	0	1,697	0	927	0	0	0	0	483	0
1992	1,806	15,982	0	12,667	0	0	0	0	30,746	0
1993	4,000	57,112	0	23,221	0	0	0	0	65,732	197
1994	2,116	21,510	0	28,793	0	1,726	0	0	40,852	0
1995	4,000	40,934	0	45,240	2,959	27,270	0	0	57,435	0
1996	4,000	84,130	0	52,722	0	1,455	0	100	148,745	0
1997	0	9,467	0	57,496	0	0	0	100	9,402	4,900
1998	15	8,956	0	49,435	0	20,000	0	0	8,721	0
1999	4,000	90,334	0	58,290	0	9,000	0	0	162,631	0
2000	3,600	63,842	0	57,920	0	0	0	0	113,952	0
2001	1,560	23,300	0	40,155	0	6,089	0	0	58,369	0
2002	2,854	34,009	0	48,179	0	7,522	0	0	47,426	0
2003	3,892	25,317	0	45,732	0	8,350	0	0	61,521	0
2004	5,803	30,546	0	45,823	0	4,979	0	0	55,625	0
2005	4,057	42,450	0	58,627	0	0	1,891	0	92,552	0
2006	1,105	34,367	0	61,410	0	0	3,266	0	64,840	0
2007	657	31,305	0	39,974	0	7,740	1,921	0	49,633	0
2008	240	14,146	0	18,974	0	21,242	107	0	16,903	0
2009	1,612	13,522	0	12,037	0	19,684	0	0	16,794	5,500
2010	26	14,005	0	17,346	0	14,094	1,900	0	40,609	0
2011	2,160	23,814	0	22,427	0	65	1,194	0	30,827	292
2012	2,699	25,847	0	17,122	0	2,168	0	0	56,570	3,400
2013	138	12,376	500	29,355	0	17,007	798	0	21,060	0
2014	912	21,341	0	30,206	0	0	1,368	0	32,012	0
2015	912	21,341	0	28,406	0	0	1,368	0	32,012	0
2016	912	21,341	0	26,006	0	0	1,368	0	32,012	0
2017	912	21,341	0	26,006	0	0	1,368	0	32,012	0
2018	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2019	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2020	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2021	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2022	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2023	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2024	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2025	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2026	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2027	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2028	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2029	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2030	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2031	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2032	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2033	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2034	2,280	21,341	0	26,006	0	0	0	0	32,012	0
2035	2,280	21,341	0	26,006	0	0	0	0	32,012	0
TOTAL	146,514	2,032,740	500	2,333,345	2,959	170,052	16,763	200	2,724,914	14,289

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 8 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 9			Reach 10A									
	KCWA		TLBWSD	AC FC&WCD	ACWD	CLWA	DRWD	KCWA		MWDSC	SBVMWD	SCVWD	TLBWSD
	(M&I)	(AG)						(M&I)	(AG)				
[78]	[79]	[80]	[81]	[82]	[83]	[84]	[85]	[86]	[87]	[88]	[89]	[90]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	30,951	0	0	0	0	0	0	0	0	0	0	0
1969	0	24,489	0	0	0	0	0	0	0	0	0	0	2,842
1970	0	46,114	1,855	0	0	0	0	0	158	0	0	0	4,315
1971	0	58,356	0	0	0	0	0	0	9,973	0	0	0	0
1972	0	75,464	0	0	0	0	0	0	5,876	0	0	0	0
1973	0	54,583	0	0	0	0	0	0	22,948	0	0	0	0
1974	0	63,814	0	0	0	0	0	10,019	22,719	0	0	0	0
1975	0	50,021	0	0	0	0	0	2,791	72,121	0	0	0	0
1976	0	53,465	0	0	0	0	0	74	50,444	0	0	0	0
1977	0	24,668	0	0	0	0	0	201	34,451	0	0	0	0
1978	0	72,231	0	0	0	0	0	0	161,889	0	0	0	0
1979	0	74,524	0	0	0	0	0	285	153,245	0	0	0	0
1980	0	79,946	0	0	0	0	0	3,780	131,836	0	0	0	0
1981	0	76,508	0	0	0	0	0	341	133,500	0	0	0	0
1982	0	76,877	0	0	0	0	0	4,700	164,832	0	0	0	0
1983	2,217	84,573	0	0	0	0	0	0	146,493	0	0	0	0
1984	4,100	85,732	0	0	0	0	0	6,910	150,302	0	0	0	0
1985	0	67,696	0	0	0	0	0	6,495	153,473	0	0	0	0
1986	0	79,943	0	0	0	0	0	5,065	198,099	0	0	0	0
1987	0	97,732	0	0	0	0	0	900	226,521	0	0	0	0
1988	1,100	83,858	0	0	0	0	0	9,529	212,495	0	0	0	0
1989	0	91,134	0	0	0	0	0	21,038	251,979	0	0	0	0
1990	0	83,108	0	0	0	0	0	25,189	47,472	0	0	0	0
1991	13,683	601	0	0	0	0	0	1,142	6,820	0	0	0	0
1992	28	40,183	0	0	0	0	0	3,685	89,390	0	0	0	0
1993	5,945	53,597	0	0	0	0	0	775	233,862	44,496	0	0	0
1994	0	44,994	0	0	0	0	0	5,227	126,792	0	0	0	0
1995	0	64,076	0	0	0	0	0	366	229,448	50,000	0	0	0
1996	2,236	89,291	0	0	6,200	0	0	6,666	199,854	95,000	0	45,000	0
1997	0	72,013	0	0	10,000	0	900	3,577	157,385	125,000	0	35,000	0
1998	0	57,530	0	1,970	3,780	0	0	2,603	163,587	39,500	0	23,800	0
1999	0	72,734	0	22,910	16,100	0	0	1,657	190,787	75,850	0	30,000	0
2000	0	73,562	0	23,940	13,380	0	0	7,672	283,208	0	0	23,730	0
2001	0	54,198	0	5,000	0	0	0	160	98,175	0	0	0	0
2002	0	60,957	0	14,287	2,083	24,000	0	145	171,498	0	0	3,311	0
2003	0	54,724	0	6,500	18,800	0	0	217	174,674	70,940	0	33,000	0
2004	0	54,330	0	5,740	8,000	32,522	0	65,751	117,286	0	0	0	0
2005	0	53,206	0	0	28,422	0	0	146	232,519	31,210	0	55,448	0
2006	0	56,909	0	5,740	27,447	0	5,000	0	237,623	0	0	64,036	0
2007	0	66,018	0	717	1,029	0	3,000	0	203,794	0	0	3,692	0
2008	0	63,315	0	0	0	0	2,800	1,702	103,176	0	0	4,306	0
2009	0	64,007	2,330	0	0	0	2,000	690	95,798	0	0	0	0
2010	0	76,357	0	3,000	7,000	0	2,000	14	102,773	74,000	0	51,990	800
2011	0	78,177	2,000	3,414	16,020	0	2,908	26	137,476	149,012	0	65,770	500
2012	0	69,395	2,000	0	7,500	0	1,660	29	201,730	45,000	2,868	0	0
2013	0	47,272	0	0	0	0	0	2,023	108,467	0	0	0	0
2014	0	56,755	0	0	2,686	0	0	0	128,691	0	0	0	0
2015	0	56,755	0	0	1,562	0	0	0	128,691	0	0	0	0
2016	0	56,755	0	0	1,562	0	0	0	128,691	0	0	0	0
2017	0	56,755	0	0	1,562	0	0	0	128,691	0	0	0	0
2018	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2019	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2020	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2021	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2022	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2023	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2024	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2025	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2026	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2027	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2028	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2029	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2030	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2031	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2032	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2033	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2034	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2035	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
TOTAL	29,309	4,162,841	8,185	93,218	173,133	56,522	20,268	201,590	9,086,650	800,008	2,868	439,083	8,457

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 9 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 11B					Reach 12D			Reach 12E				
	CLWA	DRWD	KCWA		TLBWS	KCWA		AC FC&WCD	ACWD	CLWA	DRWD	KCWA	
			(M&I)	(AG)		(M&I)	(AG)					(M&I)	(AG)
[91]	[92]	[93]	[94]	[95]	[96]	[97]	[98]	[99]	[100]	[101]	[102]	[103]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	24,776	0	0	0	0	0	0	0	0	0
1969	0	0	0	64,682	0	0	0	0	0	0	0	0	0
1970	0	0	0	72,279	0	0	0	0	0	0	0	0	9,279
1971	0	0	0	63,773	0	0	0	0	0	0	0	0	28,056
1972	0	0	0	72,358	0	0	0	0	0	0	0	0	62,342
1973	0	0	0	67,544	0	0	0	0	0	0	0	0	13,082
1974	0	0	0	87,476	0	0	0	0	0	0	0	2,651	4,248
1975	0	0	0	85,675	0	0	0	0	0	0	0	0	10,787
1976	0	0	0	85,067	0	0	0	0	0	0	0	37,519	20,555
1977	0	0	3,981	29,603	0	0	0	0	0	0	0	20,280	1,737
1978	0	0	0	88,753	0	0	0	0	0	0	0	47,133	15,011
1979	0	0	484	108,379	0	0	0	0	0	0	0	50,740	61,567
1980	0	0	3,112	103,207	0	0	0	0	0	0	0	32,039	22,252
1981	0	0	494	104,395	0	0	0	0	0	0	0	59,917	58,470
1982	0	0	798	99,081	0	0	0	0	0	0	0	36,139	75,587
1983	0	0	2,069	94,117	0	0	0	0	0	0	0	0	10,950
1984	0	0	2,349	124,819	0	0	0	0	0	0	0	63,941	39,929
1985	0	0	10,666	118,646	0	0	0	0	0	0	0	69,839	84,117
1986	0	0	8,673	124,836	0	0	0	0	0	0	0	62,109	51,540
1987	0	0	13,074	111,877	0	0	0	0	0	0	0	95,297	86,223
1988	0	0	13,509	114,031	0	0	0	0	0	0	0	86,390	123,249
1989	0	0	9,986	127,058	0	0	0	0	0	0	0	83,965	146,544
1990	0	0	9,319	104,107	0	0	0	0	0	0	0	82,164	38,973
1991	0	0	6,099	118	0	0	0	0	0	0	0	8,842	303
1992	0	0	7,419	35,093	0	0	0	0	0	0	0	47,181	57,048
1993	0	0	2,696	72,645	0	0	0	0	0	0	0	84,822	285,554
1994	0	0	3,506	71,202	0	0	0	0	0	0	0	66,188	77,839
1995	0	0	1,154	97,072	0	0	0	0	0	0	1,000	107,130	181,097
1996	0	0	1,185	96,250	0	0	0	0	0	0	4,131	89,257	134,138
1997	0	0	1,111	104,823	0	0	0	0	0	0	8,012	32,061	128,329
1998	0	0	1,311	72,646	0	0	0	0	0	0	5,925	28,258	88,998
1999	0	0	2,127	92,262	0	0	0	0	0	0	1,321	110,161	255,343
2000	0	1,500	3,793	89,622	0	21	0	0	0	0	953	11,772	156,215
2001	0	0	636	73,105	0	41	0	0	0	0	0	385	51,076
2002	0	0	1,457	91,123	0	760	6	0	0	0	0	0	135,335
2003	0	0	1,379	87,174	0	2,431	152	0	0	0	0	39,479	112,056
2004	0	0	1,299	97,722	0	3,419	768	0	0	0	1,600	52,303	95,893
2005	0	0	824	93,554	0	2,841	644	3,419	1,878	20,000	1,154	43,835	340,281
2006	0	0	0	98,417	0	2,513	1,556	10,000	0	20,000	0	82,207	296,230
2007	0	0	4,030	94,334	0	2,164	2,284	0	0	8,200	0	1,179	87,764
2008	0	0	263	93,417	0	1,514	3,000	0	0	0	0	0	58,983
2009	0	300	127	96,776	0	564	4,274	0	0	0	0	564	82,434
2010	0	5,350	381	92,220	974	1,904	2,206	10,000	0	25,844	0	4,851	72,809
2011	0	0	1,160	105,682	3,500	973	65	10,000	1,960	0	0	26,249	313,619
2012	0	2,000	1,145	103,889	0	3,334	939	20,309	0	6,416	200	19,213	102,076
2013	0	0	4,144	89,560	0	5,450	710	0	0	0	0	27,382	44,031
2014	0	0	7,500	49,405	0	6,000	0	10,000	0	0	0	0	77,735
2015	0	0	7,500	49,405	0	6,000	0	0	0	0	0	0	77,735
2016	0	0	7,500	49,405	0	6,000	0	0	0	0	0	53,950	77,735
2017	0	0	7,500	49,405	0	6,000	0	0	0	0	0	53,950	77,735
2018	0	0	9,000	44,254	0	7,200	0	0	0	13,220	0	49,744	68,236
2019	0	0	9,000	44,254	0	7,200	0	0	0	13,920	0	49,744	68,236
2020	0	0	9,000	44,254	0	7,200	0	0	0	13,620	0	49,744	68,236
2021	0	0	9,000	44,254	0	7,200	0	0	0	12,820	0	49,744	68,236
2022	0	0	9,000	44,254	0	7,200	0	0	0	11,920	0	49,744	68,236
2023	0	0	9,000	44,254	0	7,200	0	0	0	11,120	0	49,744	68,236
2024	0	0	9,000	44,254	0	7,200	0	0	0	10,220	0	49,744	68,236
2025	0	0	9,000	44,254	0	7,200	0	0	0	9,420	0	49,744	68,236
2026	0	0	9,000	44,254	0	7,200	0	0	0	8,920	0	49,744	68,236
2027	0	0	9,000	44,254	0	7,200	0	0	0	8,320	0	49,744	68,236
2028	0	0	9,000	44,254	0	7,200	0	0	0	7,820	0	49,744	68,236
2029	0	0	9,000	44,254	0	7,200	0	0	0	7,120	0	49,744	68,236
2030	0	0	9,000	44,254	0	7,200	0	0	0	6,520	0	49,744	68,236
2031	0	0	9,000	44,254	0	7,200	0	0	0	5,620	0	49,744	68,236
2032	0	0	9,000	44,254	0	7,200	0	0	0	4,820	0	49,744	68,236
2033	0	0	9,000	44,254	0	7,200	0	0	0	4,020	0	49,744	68,236
2034	0	0	9,000	44,254	0	7,200	0	0	0	3,220	0	49,744	68,236
2035	0	0	9,000	44,254	0	7,200	0	0	0	2,420	0	49,744	68,236
TOTAL	0	9,150	317,760	5,019,437	4,474	181,529	16,604	63,728	3,838	235,520	24,296	2,824,070	5,661,137

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

heet 10 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 12E			Reach 13B									
	MWDS	SBVMWD	SCVWD	AC FC&WCD	ACWD	DRWD	KCWA		MWDS	PWD	SBC FC&WCD	SCVWD	TLBWS
(M&I)							(AG)						
[104]	[105]	[106]	[107]	[108]	[109]	[110]	[111]	[112]	[113]	[114]	[115]	[116]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	4,891	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	17,388	0	0	0	0	0
1973	0	0	0	0	0	0	0	9,297	0	0	0	0	0
1974	0	0	0	0	0	0	8,038	4,246	0	0	0	0	0
1975	0	0	0	0	0	0	8,538	7,059	0	0	0	0	0
1976	0	0	0	0	0	0	5,626	8,855	0	0	0	0	0
1977	0	0	0	0	0	0	0	5,024	0	0	0	0	0
1978	0	0	0	0	0	0	21,773	7,601	0	0	0	0	0
1979	0	0	0	0	0	0	5,663	17,766	0	0	0	0	0
1980	0	0	0	0	0	0	0	22,515	0	0	0	0	0
1981	0	0	0	0	0	0	7,844	14,037	0	0	0	0	0
1982	0	0	0	0	0	0	0	25,553	0	0	0	0	0
1983	0	0	0	0	0	0	0	3,491	0	0	0	0	0
1984	0	0	0	0	0	0	12,117	26,178	0	0	0	0	0
1985	0	0	0	0	0	0	0	67,711	0	0	0	0	0
1986	0	0	0	0	0	0	0	66,551	0	0	0	0	0
1987	0	0	0	0	0	0	5,609	40,374	0	0	0	0	0
1988	0	0	0	0	0	0	9,298	47,167	0	0	0	0	0
1989	0	0	0	0	0	0	5,504	57,114	0	0	0	0	0
1990	0	0	0	0	0	0	7,645	20,423	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	789	17,449	0	0	0	0	0
1993	5,504	0	0	0	0	0	12,798	88,157	0	0	0	0	0
1994	0	0	0	0	0	0	2,494	33,148	0	0	0	0	0
1995	0	0	0	0	0	0	8,751	110,685	0	0	0	0	3,500
1996	0	0	0	0	0	0	28,063	64,849	0	0	0	0	0
1997	1,486	0	0	0	0	0	43,803	49,312	0	0	0	0	0
1998	24,234	0	0	0	0	0	29,444	40,085	5,500	0	0	0	0
1999	62,162	0	0	0	0	0	12,969	92,998	0	0	0	0	0
2000	149,731	0	0	0	0	0	0	102,202	0	0	0	0	0
2001	0	0	0	0	0	1,733	0	33,925	0	0	0	0	0
2002	0	0	0	0	0	736	0	71,444	0	0	0	0	0
2003	45,989	0	0	0	0	350	2,396	124,582	1,865	0	0	0	0
2004	0	0	0	0	0	1,657	1,922	73,801	0	0	0	0	0
2005	15,384	0	2,619	2,321	0	14,540	21,781	269,631	192	0	0	9,014	0
2006	5,065	0	0	0	0	5,670	11,787	196,116	0	0	0	0	0
2007	0	0	0	0	0	2,161	0	72,240	0	0	0	0	0
2008	0	0	0	0	0	0	200	9,785	0	0	0	2,324	0
2009	0	0	0	0	0	0	0	12,060	0	0	0	0	0
2010	134,855	0	0	0	0	304	0	63,966	22,000	0	0	0	10,000
2011	109,787	8,066	706	2,331	3,420	34,733	4,896	273,275	25,845	4,452	2,548	0	0
2012	92,857	19,066	0	0	0	0	448	74,906	490	0	0	0	8,000
2013	1,100	0	0	0	0	0	7,161	19,109	0	0	0	0	0
2014	60,000	0	0	0	0	0	4,000	26,167	0	0	0	0	0
2015	60,000	0	0	0	0	0	4,000	26,167	0	0	0	0	0
2016	60,000	0	0	0	0	0	4,000	26,167	0	0	0	0	0
2017	60,000	0	0	0	0	0	4,000	26,167	0	0	0	0	0
2018	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2019	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2020	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2021	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2022	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2023	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2024	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2025	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2026	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2027	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2028	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2029	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2030	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2031	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2032	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2033	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2034	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2035	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
TOTAL	1,572,154	27,132	3,325	4,652	3,420	61,884	389,757	2,929,680	55,892	4,452	2,548	11,338	21,500

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 11 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 14A		Reach 14B		Reach 14C			Reach 15A		Reach 16A		
	KCWA		KCWA		KCWA		MWDSC	KCWA		AVEKWA	KCWA	
	(M&I)	(AG)	(M&I)	(AG)	(M&I)	(AG)		(M&I)	(AG)		(M&I)	(AG)
	[117]	[118]	[119]	[120]	[121]	[122]	[123]	[124]	[125]	[126]	[127]	[128]
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	3	0	0	0	0	0	0	0	0
1971	0	23,844	0	49,929	0	24,187	0	0	3,552	0	0	0
1972	0	26,621	0	77,034	0	35,016	0	0	6,064	0	0	4,768
1973	0	15,328	0	47,040	0	19,043	0	0	19,916	0	0	1,961
1974	0	7,794	0	32,356	0	12,601	0	0	18,000	0	3,000	1,564
1975	0	10,306	0	27,736	0	12,783	0	0	35,420	0	3,200	9,867
1976	0	268	0	35,296	0	9,005	0	0	39,551	0	3,500	11,667
1977	0	8,299	0	13,539	0	3,757	0	0	6,158	0	3,420	685
1978	0	34,029	0	72,351	0	24,542	0	0	31,148	0	7,989	1,655
1979	3,012	27,356	0	59,413	0	22,372	0	0	38,602	0	2,813	15,808
1980	4,312	16,876	0	40,513	0	19,953	0	0	37,817	0	2,700	16,145
1981	4,511	13,007	8	42,753	7	18,729	0	0	39,033	7	2,636	18,156
1982	3,735	24,240	184	57,739	0	26,479	0	0	47,782	0	1,921	16,577
1983	1,168	20,302	0	57,922	0	26,613	0	0	37,426	0	1,400	17,907
1984	137	35,369	10	79,179	2	34,996	0	0	49,848	0	1,338	24,246
1985	206	33,103	0	72,855	0	31,758	0	0	44,078	0	1,309	16,820
1986	180	26,384	0	70,864	0	34,566	0	0	42,461	0	1,213	15,559
1987	610	30,098	9	67,710	10	31,019	0	0	34,748	0	1,665	10,170
1988	622	32,778	19	75,968	1	37,165	0	16	41,978	0	1,925	8,987
1989	721	29,292	7	82,201	5	37,800	0	2	43,239	0	2,668	8,649
1990	673	26,800	13	81,076	9	34,174	0	6	36,347	0	2,819	8,608
1991	768	0	0	0	0	0	0	0	0	2,000	2,588	343
1992	673	16,238	464	41,143	0	18,084	0	0	24,243	0	2,087	8,275
1993	629	17,832	0	62,493	0	28,103	0	0	27,997	0	2,494	9,167
1994	2,513	16,760	3,000	54,011	1,000	22,624	0	0	29,511	0	3,011	13,877
1995	3	21,234	0	67,391	0	31,285	0	0	26,134	0	3,188	15,042
1996	0	26,978	0	85,936	0	38,879	0	0	36,186	0	2,573	18,142
1997	0	23,035	0	79,790	0	33,512	0	0	36,281	0	3,997	17,048
1998	0	15,706	0	58,132	0	23,097	0	0	28,712	0	3,751	17,032
1999	0	21,153	0	67,576	0	31,489	0	0	36,801	0	3,316	24,071
2000	0	19,264	0	70,585	0	33,716	0	0	40,063	0	3,015	20,919
2001	0	12,452	0	49,602	0	23,557	0	0	31,192	0	1,894	13,476
2002	0	11,181	0	52,762	0	27,138	0	0	41,552	0	4,227	14,520
2003	0	13,685	0	44,576	0	24,783	12,911	0	36,602	0	1,168	16,799
2004	0	13,030	0	52,012	0	30,313	0	0	40,184	0	2,239	19,714
2005	0	15,663	0	56,739	0	21,979	0	0	39,870	0	167	18,353
2006	0	17,779	0	65,142	1,413	20,193	5,440	0	46,244	0	279	22,570
2007	0	21,435	0	67,955	0	24,947	1,881	0	47,390	0	204	26,229
2008	0	20,087	0	63,497	0	27,847	0	0	33,029	0	3,834	18,426
2009	0	22,281	0	60,726	0	27,185	0	0	26,007	0	1,531	19,517
2010	0	21,964	0	58,110	0	25,477	29,818	0	22,045	0	1,033	19,829
2011	0	24,131	0	61,859	0	27,061	27,326	0	42,158	0	3,808	17,957
2012	0	25,982	0	64,489	0	23,446	31,703	0	27,920	0	3,453	19,842
2013	0	18,976	0	45,134	0	16,691	10,194	0	21,986	0	5,261	27,153
<b>2014</b>	<b>0</b>	<b>21,800</b>	<b>0</b>	<b>37,100</b>	<b>0</b>	<b>19,609</b>	<b>0</b>	<b>0</b>	<b>23,000</b>	<b>0</b>	<b>6,266</b>	<b>15,100</b>
2015	0	21,800	0	37,100	0	19,609	0	0	23,000	0	6,266	15,100
2016	0	21,800	0	37,100	0	19,609	0	0	23,000	0	6,266	15,100
2017	0	21,800	0	37,100	0	19,609	0	0	23,000	0	6,266	15,100
2018	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2019	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2020	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2021	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2022	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2023	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2024	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2025	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2026	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2027	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2028	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2029	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2030	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2031	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2032	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2033	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2034	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2035	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
<b>TOTAL</b>	<b>24,473</b>	<b>1,250,320</b>	<b>3,714</b>	<b>3,357,737</b>	<b>2,447</b>	<b>1,511,000</b>	<b>119,273</b>	<b>24</b>	<b>1,976,029</b>	<b>2,000</b>	<b>255,086</b>	<b>913,300</b>



**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 12 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	TEHACHAPI DIVISION	MOJAVE DIVISION										
	Reach 17E	Reach 18A	Reach 19			Reach 20A			Reach 20B			Reach 21
	KCWA	AVEKWA	AVEKWA	MWA	PWD	AVEKWA	MWA	PWD	AVEKWA	LCID	PWD	AVEKWA
(M&I)												
	[129]	[130]	[131]	[132]	[133]	[134]	[135]	[136]	[137]	[138]	[139]	[140]
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	1,223	0	0	0	0	0	0	0	0	0
1975	0	0	7,622	0	0	420	0	0	0	0	0	0
1976	0	3,808	23,063	0	0	471	0	0	416	0	0	0
1977	0	1,231	8,927	0	0	773	0	0	271	0	0	0
1978	0	1,321	36,333	0	0	5,549	0	0	934	0	0	0
1979	0	2,098	49,910	0	0	7,555	0	0	930	0	0	0
1980	0	2,610	61,534	0	0	7,605	0	0	655	0	0	0
1981	0	2,340	65,690	0	0	10,333	0	0	966	0	0	0
1982	0	1,669	41,127	0	0	7,313	0	0	8	0	0	0
1983	0	43	26,377	0	0	6,253	0	0	20	0	0	0
1984	0	90	22,462	0	0	9,558	0	0	2	0	0	0
1985	0	8	23,440	0	0	11,613	0	1,510	217	0	32	0
1986	0	8	16,898	0	0	13,808	0	3,041	0	0	45	0
1987	0	0	15,958	0	0	15,493	0	2,389	151	0	1,624	0
1988	0	0	13,471	0	0	17,117	0	366	281	0	1,261	0
1989	0	0	18,007	0	0	23,481	0	381	112	0	7,848	0
1990	0	0	17,281	0	0	25,843	0	282	84	0	8,292	0
1991	0	0	728	0	0	4,282	1,391	84	131	0	3,830	0
1992	0	0	7,238	0	0	18,518	1,310	185	650	0	3,850	0
1993	0	0	13,340	0	0	23,662	1,514	164	996	0	7,597	0
1994	0	0	19,122	0	0	25,250	1,399	299	124	0	8,119	0
1995	0	0	20,222	0	0	22,385	1,227	328	0	0	6,633	0
1996	0	0	23,919	0	0	26,979	1,316	354	0	0	11,080	0
1997	0	0	28,834	64	0	27,999	1,272	313	0	0	11,548	0
1998	0	0	22,466	1,345	0	25,985	0	195	0	0	8,557	0
1999	0	0	30,944	1,439	0	32,409	0	377	36	0	12,901	0
2000	0	0	34,786	1,361	0	37,819	0	0	80	0	9,060	5,002
2001	0	0	24,370	1,385	0	33,216	0	0	282	0	10,427	0
2002	0	0	14,297	1,370	0	36,311	0	0	1,662	0	18,496	0
2003	0	0	12,145	1,285	0	39,532	0	0	2,289	0	11,547	0
2004	0	0	11,201	1,223	0	40,408	0	0	1,774	0	12,139	0
2005	0	11	11,804	1,051	0	41,496	0	0	1,336	0	11,678	0
2006	0	0	18,438	1,021	0	53,878	0	0	1,415	0	12,487	0
2007	0	0	22,916	1,176	0	47,639	0	0	1,349	0	19,609	0
2008	0	0	9,096	1,238	0	33,919	0	0	792	25	14,255	0
2009	0	0	5,717	1,345	0	35,402	0	0	366	42	15,339	0
2010	0	0	10,825	1,181	0	43,122	0	0	643	0	10,969	0
2011	0	0	55,707	2,184	0	35,543	0	0	507	0	9,881	0
2012	0	0	38,394	1,306	2,659	33,390	0	0	901	0	16,397	0
2013	4	7	19,506	1,477	0	37,368	0	0	1,409	0	11,767	0
2014	0	2,050	15,900	29,068	0	58,930	0	12,780	1,580	0	0	0
2015	0	2,100	16,380	27,868	0	58,150	0	12,780	1,630	0	0	0
2016	0	2,150	16,890	28,268	0	57,340	0	12,780	1,680	0	0	0
2017	0	2,200	17,400	32,763	0	56,530	0	12,780	1,730	0	0	0
2018	0	2,250	17,920	3,298	0	55,710	0	0	1,780	0	12,780	0
2019	0	2,300	18,450	3,298	0	54,860	0	0	1,830	0	12,780	0
2020	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2021	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2022	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2023	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2024	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2025	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2026	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2027	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2028	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2029	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2030	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2031	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2032	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2033	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2034	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
2035	0	2,300	18,450	898	0	54,860	0	0	1,830	0	12,780	0
TOTAL	4	65,094	1,303,478	160,382	2,659	2,138,977	9,429	61,388	61,299	67	507,308	5,002

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 13 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION										
	Reach 21		Reach 22A		Reach 22B					Reach 23	Reach 24
	LCID	PWD	AVEKWA	LCID	AVEKWA (d)	CVWD (e)	DWA (e)	MWDSC (e)	MWA	MWA	CLAWA
[141]	[142]	[143]	[144]	[145]	[146]	[147]	[148]	[149]	[150]	[151]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	338	0	0	0	0	0	0	55	0	0	464
1973	290	0	0	0	0	5,800	9,000	(14,800)	0	0	389
1974	400	0	0	0	0	6,400	10,000	(16,400)	0	14	627
1975	520	0	0	0	0	7,000	11,000	(18,000)	0	0	825
1976	589	0	0	0	0	7,600	12,000	(19,600)	0	0	1,002
1977	111	0	0	0	0	0	0	22	58	0	1,109
1978	208	0	0	0	0	10,084	15,300	(25,384)	0	0	1,209
1979	133	0	0	0	0	10,063	15,000	(25,063)	4,000	0	1,260
1980	191	0	3	0	0	10,884	17,000	(27,884)	4,000	0	1,239
1981	1,270	0	46	0	0	12,105	19,000	(31,105)	4,000	0	1,485
1982	0	0	174	0	0	13,326	21,000	(34,326)	10,500	0	1,238
1983	38	0	268	0	0	14,547	23,000	(37,547)	0	0	911
1984	1	0	550	0	0	15,768	25,000	(40,768)	0	0	1,128
1985	0	16	1,786	0	0	16,989	27,000	(43,989)	0	0	1,422
1986	163	10	1,735	0	0	18,210	29,000	(47,210)	0	0	1,506
1987	1,080	1,366	2,273	5	214	19,431	31,500	(50,931)	17	0	1,849
1988	419	143	3,210	0	0	20,652	34,000	(54,652)	9	0	2,006
1989	971	780	3,591	0	89	21,873	36,500	(58,373)	0	200	2,170
1990	1,747	34	3,988	0	10	23,100	38,100	(61,200)	0	0	1,827
1991	522	0	2,427	0	0	6,930	11,430	(18,360)	0	0	849
1992	251	0	3,859	0	0	10,427	17,197	(27,624)	42	0	519
1993	734	0	5,098	0	0	0	0	0	0	0	439
1994	1,098	0	4,657	0	0	0	0	0	14,634	0	785
1995	480	0	4,679	0	0	0	0	0	7,495	0	409
1996	494	0	5,458	0	0	0	0	0	6,111	0	485
1997	444	0	5,549	0	0	0	0	0	9,038	0	651
1998	404	0	4,468	0	0	0	0	0	2,580	0	187
1999	342	0	5,684	0	0	0	0	0	6,705	0	1,132
2000	0	0	5,890	0	0	0	0	0	10,019	0	1,194
2001	0	0	4,989	0	0	0	0	0	3,048	0	1,057
2002	0	0	5,404	0	497	0	0	0	2,976	0	2,189
2003	0	0	6,063	0	0	0	0	7,625	13,150	0	1,563
2004	0	23	6,095	0	253	0	0	0	11,953	0	2,006
2005	0	34	5,184	0	0	0	0	5,942	12,169	0	807
2006	0	5	6,653	0	0	0	0	0	32,993	0	641
2007	0	25	7,711	0	588	0	0	0	27,684	0	1,768
2008	0	0	4,756	0	0	0	0	0	20,479	0	848
2009	0	0	4,185	0	0	0	0	0	20,214	0	894
2010	0	0	3,899	0	0	0	0	0	27,640	0	357
2011	0	0	2,289	0	0	0	0	30,907	2,915	0	185
2012	0	0	2,328	0	0	0	0	12,025	9,938	0	483
2013	636	0	3,067	0	0	0	0	0	14,625	0	1,401
2014	1,380	0	6,380	0	0	0	0	0	18,612	0	3,405
2015	1,380	0	6,580	0	0	0	0	0	18,612	0	3,480
2016	1,380	0	6,780	0	0	0	0	0	20,612	0	3,480
2017	1,380	0	6,980	0	0	0	0	0	20,612	0	3,480
2018	1,380	0	7,180	0	0	0	0	0	41,582	0	3,480
2019	1,380	0	7,400	0	0	0	0	0	41,582	0	3,480
2020	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2021	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2022	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2023	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2024	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2025	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2026	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2027	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2028	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2029	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2030	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2031	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2032	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2033	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2034	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2035	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
TOTAL	44,234	2,436	287,716	5	1,651	251,189	402,027	(596,717)	1,144,335	272	121,000

(d) 1988 advance allocation.

(e) In accordance with the Exchange Agreement between the noted agencies, MWDSC assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert Water Agency and Coachella Valley Water District for such costs from the Delta through Reach 22B. The adjustment in deliveries in Reach 22B provides for compliance with provisions for the repayment of costs under the agreement. In 1993 and after the exchange takes place in Reach 26A.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 14 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION (cont)			SANTA ANA DIVISION							
	Reach 24			Reach 26A					Reach 28G	Reach 28H	
	MWDSC (e)	MWA	SBVMWD	CVWD(e)	DWA(e)	MWDSC (e)	SBVMWD (f)	SGVMWD	MWDSC	CVWD	DWA
[152]	[153]	[154]	[155]	[156]	[157]	[158]	[159]	[160]	[161]	[162]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	1,275	0	0	0	0
1973	0	0	0	0	0	444	32,426	0	18,942	0	0
1974	0	0	0	0	0	84,981	16,605	612	0	0	0
1975	0	0	0	0	0	169,960	13,865	5,450	0	0	0
1976	0	0	0	0	0	215,312	12,273	6,071	0	0	0
1977	0	0	0	0	0	64,823	24,833	8,996	0	0	0
1978	0	0	0	0	0	297,708	4,055	7,771	0	0	0
1979	0	0	0	0	0	260,903	18	290	0	0	0
1980	0	0	0	0	0	300,345	0	1,085	0	0	0
1981	0	0	0	0	0	395,678	16,021	3,619	0	0	0
1982	0	0	0	0	0	214,566	8,409	12,599	0	0	0
1983	0	0	0	0	0	175,288	5,994	734	0	0	0
1984	0	0	0	0	0	122,311	5,556	7,656	0	0	0
1985	0	0	0	0	0	147,599	7,390	5,028	0	0	0
1986	0	0	0	0	0	215,265	6,421	9,454	0	0	0
1987	0	0	0	0	0	175,012	18,751	10,630	0	0	0
1988	0	0	0	0	0	247,101	21,386	8,948	0	0	0
1989	0	0	0	0	0	326,217	20,782	12,839	0	0	0
1990	0	0	0	0	0	399,387	18,831	16,649	0	0	0
1991	0	2,032	0	0	0	107,182	3,661	5,399	0	0	0
1992	0	9,334	0	0	0	219,524	3,358	7,908	0	0	0
1993	0	10,000	0	23,100	38,100	98,291	4,361	14,397	0	0	0
1994	0	819	0	14,102	23,257	192,979	9,135	15,230	0	0	0
1995	0	0	0	23,100	38,100	107,299	696	12,922	0	0	0
1996	0	0	0	62,219	102,622	73,438	6,064	15,989	0	0	0
1997	0	0	0	58,100	53,100	157,215	9,654	18,175	0	0	0
1998	0	0	0	78,100	58,100	36,770	1,878	9,310	0	6,582	7,708
1999	0	0	0	50,480	58,100	139,752	12,874	21,729	0	0	0
2000	0	0	0	42,323	58,234	326,647	0	15,140	0	0	0
2001	0	0	0	9,100	15,010	284,007	0	2,360	0	0	0
2002	0	0	0	16,755	27,640	301,700	26,399	24,851	0	0	0
2003	17,249	0	0	14,443	23,819	464,719	5,000	21,934	0	0	0
2004	0	0	0	15,465	21,190	428,316	40,000	12,541	0	0	0
2005	14,058	341	0	34,356	49,089	361,976	15,834	13,984	0	0	0
2006	0	0	0	121,100	50,000	404,594	20,000	16,284	0	0	0
2007	0	17,249	710	66,007	27,253	370,971	10,022	4,024	0	7,221	2,981
2008	0	3,679	411	40,171	24,643	210,520	187	7,212	0	6,620	1,785
2009	0	7,488	149	45,074	17,872	138,216	0	11,520	0	948	391
2010	0	9,331	26	53,866	18,398	463,654	20,008	19,180	0	30,415	12,257
2011	14,141	0	31	84,566	34,076	610,454	368	23,591	0	5,713	2,303
2012	2,994	0	0	97,871	33,806	362,968	50,723	22,058	0	15,219	8,266
2013	0	0	77	39,879	16,344	233,714	82	9,752	0	8,708	0
2014	0	2,000	100	83,010	33,450	310,371	0	17,280	0	0	0
2015	0	5,000	100	83,010	33,450	310,371	0	17,280	0	0	0
2016	0	5,000	100	83,010	33,450	310,371	0	17,280	0	0	0
2017	0	0	100	83,010	33,450	310,371	0	17,280	0	0	0
2018	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2019	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2020	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2021	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2022	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2023	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2024	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2025	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2026	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2027	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2028	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2029	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2030	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2031	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2032	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2033	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2034	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2035	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
<b>TOTAL</b>	<b>48,442</b>	<b>234,273</b>	<b>6,484</b>	<b>2,816,397</b>	<b>1,524,653</b>	<b>19,520,820</b>	<b>475,195</b>	<b>824,081</b>	<b>18,942</b>	<b>81,426</b>	<b>35,691</b>

(e) In accordance with the Exchange Agreement between the noted agencies, MWDSC assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert Water Agency and Coachella Valley Water District for such costs from the Delta through Reach 22B. The adjustment in deliveries in Reach 22B provides for compliance with provisions for the repayment of costs under the agreement. In 1993 and after the exchange takes place in Reach 26A.

(f) Includes 1,650 AF recaptured from ground water storage in 1982, 10,000 AF in 1987, and 8,749 AF in 1988. This was water stored under DWR's Ground Water Demonstration Program.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 15 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SANTA ANA DIVISION (continued)								
	Reach 28H	Reach 28J			Reach EBX1			Reach EBX2C	Reach EBX3A
	MWDSC	CVWD	DWA	MWDSC	CVWD	MWDSC	SBVMWD	SBVMWD	SBVMWD
[163]	[164]	[165]	[166]	[167]	[168]	[169]	[170]	[171]	
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	251	0	0	0	0	0
1976	55	0	0	2,000	0	0	0	0	0
1977	43	0	0	2,442	0	0	0	0	0
1978	48	0	0	64,054	0	0	0	0	0
1979	1,290	0	0	94,353	0	0	0	0	0
1980	3,013	0	0	91,532	0	0	0	0	0
1981	4,365	0	0	149,405	0	0	0	0	0
1982	3,961	0	0	155,629	0	0	0	0	0
1983	6,645	0	0	41,616	0	0	0	0	0
1984	109,743	0	0	5,672	0	0	0	0	0
1985	182,781	0	0	6,538	0	0	0	0	0
1986	131,439	0	0	30,071	0	0	0	0	0
1987	144,743	0	0	26,315	0	0	0	0	0
1988	199,641	0	0	22,209	0	0	0	0	0
1989	247,430	0	0	51,462	0	0	0	0	0
1990	257,796	0	0	36,060	0	0	0	0	0
1991	38,832	0	0	5,958	0	0	0	0	0
1992	85,341	0	0	12,223	0	0	0	0	0
1993	61,841	0	0	4,588	0	0	0	0	0
1994	134,262	0	0	4,725	0	0	0	0	0
1995	117,762	0	0	21,099	0	0	0	0	0
1996	144,906	0	0	12,418	0	0	0	0	0
1997	107,853	0	0	47,777	0	0	0	0	0
1998	77,473	1,027	4,839	50,411	0	0	0	0	0
1999	206,689	0	0	8,163	0	0	0	0	0
2000	379,713	0	0	7,864	0	5,466	18,399	0	0
2001	260,984	0	0	33,414	0	0	26,488	0	0
2002	340,635	0	0	41,552	0	1,427	37,069	0	0
2003	246,485	0	0	50,776	0	74,496	16,703	1,793	2,617
2004	357,995	0	0	20,437	0	120,338	13,229	1,430	2,371
2005	242,245	0	0	114,499	8,163	153,700	12,715	966	2,035
2006	342,734	0	0	32,242	0	147,432	11,832	885	2,614
2007	271,874	0	0	48,923	0	94,208	38,151	3,130	5,103
2008	175,460	0	0	10,432	0	16,745	25,038	686	8,823
2009	126,265	0	0	5,849	0	18,314	25,041	4,090	10,066
2010	129,145	1,311	528	65,439	0	0	19,190	617	9,538
2011	213,215	0	0	51,638	0	0	19,578	699	9,384
2012	87,622	1,426	1,045	39,652	0	0	27,564	3,177	9,604
2013	59,236	0	459	32,200	0	0	36,110	212	1,816
2014	64,217	0	0	131,827	0	0	61,460	0	0
2015	64,217	0	0	131,827	0	0	61,460	0	0
2016	64,217	0	0	131,827	0	0	61,460	0	0
2017	64,217	0	0	131,827	0	0	61,460	0	0
2018	69,282	0	0	58,345	0	0	61,300	0	0
2019	69,282	0	0	58,345	0	0	61,300	0	0
2020	69,282	0	0	58,345	0	0	61,300	0	0
2021	69,282	0	0	58,345	0	0	61,300	0	0
2022	69,282	0	0	58,345	0	0	61,300	0	0
2023	69,282	0	0	58,345	0	0	61,300	0	0
2024	69,282	0	0	58,345	0	0	61,300	0	0
2025	69,282	0	0	58,345	0	0	61,300	0	0
2026	69,282	0	0	58,345	0	0	61,300	0	0
2027	69,282	0	0	58,345	0	0	61,300	0	0
2028	69,282	0	0	58,345	0	0	61,300	0	0
2029	69,282	0	0	58,345	0	0	61,300	0	0
2030	69,282	0	0	58,345	0	0	61,300	0	0
2031	69,282	0	0	58,345	0	0	61,300	0	0
2032	69,282	0	0	58,345	0	0	61,300	0	0
2033	69,282	0	0	58,345	0	0	61,300	0	0
2034	69,282	0	0	58,345	0	0	61,300	0	0
2035	69,282	0	0	58,345	0	0	61,300	0	0
TOTAL	7,005,504	3,764	6,871	3,079,406	8,163	632,126	1,676,347	17,685	63,971

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 16 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)			WEST BRANCH						
	Reach EBX4B-G	Reach EBX4B	Reach 29F	Reach 29H		Reach 30				
	SGPWA	SGPWA	AVEKWA	CLWA	VCFC	CLWA	CVWD	DWA	MWDSC (g)	SBVMWD
[172]	[173]	[174]	[175]	[176]	[177]	[178]	[179]	[180]	[181]	
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	53	0	0	0	0	0	71,938	0
1973	0	0	20	0	0	0	0	0	155,297	0
1974	0	0	36	0	0	0	0	0	209,136	0
1975	0	0	26	0	0	0	0	0	374,280	0
1976	0	0	24	0	0	0	0	0	420,684	0
1977	0	0	0	0	0	0	0	0	122,447	0
1978	0	0	0	0	0	0	0	0	171,139	0
1979	0	0	0	0	0	7	0	0	145,591	0
1980	0	0	0	0	0	1,210	0	0	164,721	0
1981	0	0	0	0	0	5,761	0	0	277,503	0
1982	0	0	0	0	0	9,516	0	0	351,362	0
1983	0	0	0	0	0	9,476	0	0	157,519	0
1984	0	0	0	0	0	11,477	0	0	260,624	0
1985	0	0	0	0	0	12,401	0	0	390,696	0
1986	0	0	0	0	0	13,928	0	0	379,275	0
1987	0	0	0	0	0	16,167	0	0	417,285	0
1988	0	0	0	0	0	18,904	0	0	488,265	0
1989	0	0	0	0	0	21,719	0	0	589,962	0
1990	0	0	0	0	4,836	22,139	0	0	764,380	0
1991	0	0	0	0	988	3,846	0	0	257,835	0
1992	0	0	0	0	0	14,812	0	0	420,849	0
1993	0	0	6	0	0	13,787	0	0	437,470	0
1994	0	0	0	0	0	14,919	0	0	475,900	0
1995	0	0	0	0	0	17,747	0	0	139,882	0
1996	0	0	0	0	0	18,448	0	0	267,618	0
1997	0	0	11	0	0	22,842	10,240	16,890	271,379	0
1998	0	0	7	0	0	19,782	0	0	187,277	0
1999	0	0	0	0	0	28,813	0	0	327,001	0
2000	0	0	0	0	2,200	31,085	0	0	632,991	0
2001	0	0	0	0	0	30,701	0	0	444,764	0
2002	0	0	0	0	3,148	42,080	0	0	723,605	8,601
2003	0	116	0	6,768	3,150	44,967	0	0	678,964	0
2004	0	841	0	0	4,047	47,463	0	0	797,294	0
2005	0	692	0	0	0	36,747	0	0	538,839	0
2006	3,471	807	0	0	0	40,017	0	0	574,679	0
2007	3,758	177	0	0	1,890	45,919	0	0	711,831	0
2008	3,863	1,042	0	0	1,980	42,878	0	0	485,156	0
2009	4,499	1,898	0	0	3,150	38,784	0	0	589,294	0
2010	2,555	5,685	0	0	3,150	31,288	0	0	376,877	0
2011	1,213	9,290	0	0	2,520	31,445	0	0	375,921	0
2012	0	11,010	24	0	3,150	36,104	0	0	553,244	0
2013	0	9,008	4	0	583	54,425	0	0	503,156	0
<b>2014</b>	<b>4,095</b>	<b>6,285</b>	<b>0</b>	<b>0</b>	<b>1,890</b>	<b>51,120</b>	<b>0</b>	<b>0</b>	<b>580,485</b>	<b>0</b>
2015	475	9,905	0	0	1,890	51,120	0	0	580,485	0
2016	455	9,925	0	0	1,890	51,120	0	0	580,485	0
2017	435	9,945	0	0	1,890	51,120	0	0	580,485	0
2018	860	9,520	0	0	1,890	39,900	0	0	516,188	0
2019	680	9,700	0	0	1,890	39,200	0	0	516,188	0
2020	680	9,700	0	0	1,890	39,500	0	0	516,188	0
2021	680	9,700	0	0	1,890	40,300	0	0	516,188	0
2022	680	9,700	0	0	1,890	41,200	0	0	516,188	0
2023	680	9,700	0	0	1,890	42,000	0	0	516,188	0
2024	680	9,700	0	0	1,890	42,900	0	0	516,188	0
2025	680	9,700	0	0	1,890	43,700	0	0	516,188	0
2026	680	9,700	0	0	1,890	44,200	0	0	516,188	0
2027	680	9,700	0	0	1,890	44,800	0	0	516,188	0
2028	680	9,700	0	0	1,890	45,300	0	0	516,188	0
2029	680	9,700	0	0	1,890	46,000	0	0	516,188	0
2030	680	9,700	0	0	1,890	46,600	0	0	516,188	0
2031	680	9,700	0	0	1,890	47,500	0	0	516,188	0
2032	680	9,700	0	0	1,890	48,300	0	0	516,188	0
2033	680	9,700	0	0	1,890	49,100	0	0	516,188	0
2034	680	9,700	0	0	1,890	49,900	0	0	516,188	0
2035	680	9,700	0	0	1,890	50,700	0	0	516,188	0
<b>TOTAL</b>	<b>37,239</b>	<b>251,046</b>	<b>211</b>	<b>6,768</b>	<b>76,372</b>	<b>1,857,184</b>	<b>10,240</b>	<b>16,890</b>	<b>28,297,254</b>	<b>8,601</b>

(g) Deliveries exclude 6,171 AF of 1982 exchange water.



**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 17 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										TOTAL	GRAND TOTAL
	WEST BRANCH (continued)		COASTAL BRANCH									
	Reach 30		Reach 31A					Reach 33A				
	SBC FC&WCD	VCFC	AVEKWA	CLWA	DRWD	KCWA		CK	SLOC FC&WCD	SBC FC&WCD		
(M&I)						(AG)						
	[182]	[183]	[184]	[185]	[186]	[187]	[188]	[189]	[190]	[191]	[192]	[193]
1962	0	0	0	0	0	0	0	0	0	0	0	8,906
1963	0	0	0	0	0	0	0	0	0	0	0	12,645
1964	0	0	0	0	0	0	0	0	0	0	0	20,911
1965	0	0	0	0	0	0	0	0	0	0	0	34,026
1966	0	0	0	0	0	0	0	0	0	0	0	54,913
1967	0	0	0	0	0	0	0	0	0	0	0	56,763
1968	0	0	0	7,382	0	0	71,657	0	0	0	192,188	294,457
1969	0	0	0	9,970	0	0	52,094	0	0	0	195,705	268,104
1970	0	0	0	11,739	0	0	71,910	0	0	0	276,211	369,459
1971	0	0	0	12,490	0	0	98,481	0	0	0	553,081	654,442
1972	0	0	0	13,905	0	0	107,850	0	0	0	895,006	1,037,770
1973	0	0	0	9,418	0	0	69,227	0	0	0	638,930	737,532
1974	0	0	0	9,700	0	0	68,474	0	0	0	783,984	878,947
1975	0	0	0	10,700	0	0	74,516	0	0	0	1,129,728	1,230,830
1976	0	0	0	11,700	0	0	78,358	0	0	0	1,245,662	1,380,124
1977	0	0	0	5,075	0	0	35,504	0	0	0	895,006	1,037,770
1978	0	0	0	11,362	0	0	81,242	0	0	0	1,339,268	1,458,733
1979	0	0	0	19,138	0	0	104,017	0	0	0	1,537,075	1,666,457
1980	0	0	0	13,882	0	0	97,497	0	0	0	1,413,363	1,536,456
1981	0	0	0	12,700	0	0	97,054	0	0	0	1,779,479	1,918,563
1982	0	0	0	12,700	0	0	83,076	0	0	0	1,641,571	1,750,862
1983	0	0	0	12,659	0	0	87,859	0	0	0	1,089,626	1,187,156
1984	0	0	0	12,741	0	0	119,098	0	0	0	1,489,814	1,591,416
1985	0	0	0	12,099	0	0	110,124	0	0	0	1,863,544	1,990,295
1986	0	0	0	13,301	0	0	118,298	0	0	0	1,882,290	1,999,155
1987	0	0	0	11,821	0	0	116,259	0	0	0	1,984,570	2,131,608
1988	0	0	0	11,534	0	0	109,435	0	0	0	2,221,538	2,385,122
1989	0	0	0	14,645	0	0	102,156	0	0	0	2,686,838	2,853,747
1990	0	0	0	6,440	0	0	103,362	0	0	0	2,398,121	2,582,151
1991	1,240	0	0	716	0	0	780	0	0	0	489,489	549,113
1992	0	0	0	5,887	0	0	73,748	0	0	0	1,374,775	1,471,454
1993	0	0	0	4,157	0	0	90,764	0	0	0	2,173,352	2,315,235
1994	0	0	0	9,422	0	200	77,536	0	0	0	1,727,504	1,861,976
1995	0	0	0	9,486	0	0	85,050	0	0	0	1,926,835	2,031,423
1996	0	0	0	14,052	0	0	100,578	0	0	0	2,429,928	2,543,472
1997	0	1,850	0	4,870	0	0	97,020	0	1,099	7,439	2,263,966	2,405,444
1998	0	1,850	0	311	0	0	86,879	0	3,592	18,618	1,657,381	1,764,963
1999	0	1,850	0	4,086	0	0	92,095	0	3,743	20,137	2,755,025	2,898,961
2000	0	1,850	0	8,395	0	0	85,215	0	3,962	22,741	3,390,079	3,569,072
2001	0	1,850	0	1,238	0	0	63,448	0	4,283	18,946	2,034,350	2,175,194
2002	0	1,850	0	2,737	0	0	65,055	0	4,355	27,636	2,738,943	2,909,555
2003	0	1,850	0	4,001	0	0	65,691	0	4,453	26,968	3,151,625	3,327,811
2004	0	1,203	0	3,776	0	0	66,498	0	4,185	29,705	3,050,652	3,230,590
2005	0	1,665	0	2,709	4,684	0	68,190	0	4,251	23,344	3,597,829	3,753,874
2006	0	1,850	0	2,735	0	0	85,214	0	4,209	23,275	3,526,551	3,693,938
2007	0	1,110	0	6,071	0	0	93,954	49	3,776	27,740	3,088,763	3,284,475
2008	0	1,818	0	0	0	17,059	68,385	0	3,402	18,393	1,978,428	2,152,219
2009	0	741	0	1	0	0	83,255	0	3,801	15,452	2,059,805	2,221,501
2010	0	925	0	768	2,967	0	81,047	276	3,757	17,775	2,690,242	2,832,658
2011	0	1,480	0	2,188	200	0	86,594	238	3,819	21,050	3,509,012	3,664,760
2012	0	1,203	33,511	3,204	0	0	50,050	0	3,944	19,474	2,731,179	2,886,637
2013	0	2,307	0	2,511	0	0	47,253	107	5,346	22,527	1,775,212	1,968,769
2014	0	10,110	0	6,000	0	0	55,260	183	4,830	27,292	2,302,593	2,477,954
2015	0	10,110	0	6,000	0	0	55,260	183	4,830	27,292	2,291,544	2,478,544
2016	0	10,110	0	6,000	0	0	55,260	183	4,830	27,292	2,291,544	2,478,601
2017	0	10,110	0	6,000	0	0	55,260	183	4,830	27,292	2,291,039	2,478,096
2018	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,280
2019	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,300
2020	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,390
2021	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,455
2022	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,526
2023	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2024	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2025	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2026	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2027	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2028	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2029	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2030	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2031	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2032	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2033	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2034	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605
2035	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,687
TOTAL	1,240	195,672	33,511	456,422	7,851	17,259	4,987,567	4,696	307,991	961,644	136,302,129	146,804,148

## Tables B-5A-Adj through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor**

Calendar Year	CALIFORNIA AQUEDUCT												
	SAN LUIS DIVISION												
	Reach 1	Reach 3A											
	SCVWD	AVEK	CLWA	CLAWA	DRWD	KCWA (AG)	MWDSC	MWA	PWD	SBVMWD	SGVMWD	SGPWD	SLOC FC&WCD
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	(11,135)	0	0	0	0	0	0	0
2001	0	0	0	0	0	(11,487)	0	0	0	0	0	0	0
2002	0	0	0	0	0	(9,332)	0	0	0	0	0	0	0
2003	0	0	0	0	0	(18,428)	0	0	0	0	0	0	0
2004	0	0	0	0	0	(866)	0	0	0	0	0	0	0
2005	0	0	0	0	(576)	(20,082)	0	0	0	0	0	0	0
2006	0	0	0	0	0	(20,239)	0	0	0	0	0	0	0
2007	0	0	0	0	0	(9,867)	0	0	0	0	0	0	0
2008	0	0	0	0	0	(99,439)	0	0	0	0	0	0	0
2009	(8,885)	(5,926)	(38)	(1)	(28)	(82,636)	(815)	(5)	(15)	(21)	(4)	(4)	(2)
2010	0	0	(3,300)	0	0	(87,370)	(177,476)	0	0	0	0	0	0
2011	0	0	0	0	0	(56,909)	(106,423)	0	0	0	0	0	0
2012	0	0	0	0	(6,068)	(40,442)	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(8,885)	(5,926)	(3,338)	(1)	(6,672)	(468,232)	(284,714)	(5)	(15)	(21)	(4)	(4)	(2)

**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor**

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)						SOUTH SAN JOAQUIN DIVISION					
	Reach 3A				Reach 4		Reach 7		Reach 10A			
	SBC FC&WCD	SCVWD	TLBWSD	VCFC	KCWA (AG)	TLBWSD	KCWA (AG)	TLBWSD	AC FC&WCD	ACWD	CLWA	DWA
[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	(12,806)	0	(24,167)	(2,981)	0	0	0	0
2001	0	0	0	0	0	0	0	(25,164)	(1,807)	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	(4,000)	0	0	(6,020)	0	0	0	0	0	0
2005	0	(20,000)	(277)	0	0	0	0	0	0	0	0	0
2006	0	(53,573)	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	(5,000)	0	0	0
2008	0	(3,681)	0	0	0	0	0	0	(7,000)	(10,000)	0	(4,864)
2009	(19)	(1,000)	(49)	(1)	0	0	0	0	(3,083)	(4,950)	0	0
2010	0	(44,668)	(17,551)	0	0	0	0	0	0	0	0	0
2011	0	(49,579)	(11,096)	0	0	0	0	0	0	0	0	0
2012	0	0	(9,366)	0	0	0	0	0	0	0	0	0
2013	0	0	(1,054)	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(19)	(172,501)	(43,393)	(1)	(12,806)	(6,020)	(24,167)	(28,145)	(8,807)	(18,083)	(4,950)	(4,864)

**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor**

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 10A			Reach 12E							Reach 13B		
	KCWA (AG)	MWDSC	SCVWD	AVEK	CLWA	CVWD	DWA	KCWA (AG)	MWDSC	SCVWD	DRWD	KCWA (AG)	MWDSC
[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	0
2001	(1,813)	(31,500)	(30,000)	0	0	0	0	0	(20,800)	0	(132,228)	0	0
2002	0	0	0	0	0	0	0	(14,638)	0	0	(22,161)	0	0
2003	0	(10,000)	0	0	0	0	0	(5,170)	(5,073)	0	(15,316)	(24,523)	0
2004	(3)	(93,555)	0	0	0	0	0	0	(17,765)	0	(43,985)	(4,813)	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	(12,469)	(93,986)	(20,000)	0	(11,000)	0	0	(16,618)	(5,000)	0	(257,750)	0	0
2008	0	(99,024)	(10,000)	(8,393)	(11,000)	(3,000)	(3,486)	(103,683)	(8,402)	0	(228,579)	(25,721)	0
2009	(7,733)	(65,499)	(27,319)	(6,393)	(11,000)	(3,000)	0	(105,145)	(14,516)	(6,134)	(186,044)	0	0
2010	(56)	0	0	0	(2,750)	(8,393)	0	(43,833)	(52,413)	0	(59,451)	0	0
2011	0	0	0	0	0	0	0	(14,223)	(23,419)	0	(29,041)	0	0
2012	0	0	(17,000)	0	(4,000)	0	0	(12,815)	0	0	(6,068)	(103,364)	0
2013	0	0	(4,000)	0	0	0	0	(16,280)	0	0	0	(75,100)	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(22,074)	(393,564)	(108,319)	(14,786)	(39,750)	(14,393)	(3,486)	(332,405)	(147,388)	(6,134)	(6,068)	(1,153,019)	(55,057)



**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor**

Calendar Year	CALIFORNIA AQUEDUCT (continued)										GRAND TOTAL
	SOUTH SAN JOAQUIN DIVISION (continued)					MOJAVE DIVISION			SANTA ANA DIVISION		
	Reach 13B	Reach 14B	Reach 14C		Reach 15A	Reach 16A	Reach 22B		Reach 24	Reach EBX2C	
	PWD	KCWA (AG)	KCWA (AG)	MWDSC	KCWA (AG)	KCWA (AG)	AVEK	MWDSC	MWDSC	SBVMWD	
[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	(51,089)
2001	0	(396)	(242)	0	0	0	(152)	0	0	0	(255,589)
2002	0	0	0	0	0	0	0	0	0	0	(46,131)
2003	0	0	0	(12,380)	0	0	0	0	0	0	(90,890)
2004	0	0	0	(25,512)	0	0	0	0	0	(844)	(197,363)
2005	0	0	0	0	0	0	0	0	0	(7)	(40,942)
2006	0	0	0	0	0	0	0	0	0	(2)	(73,814)
2007	(4,926)	0	0	(24,225)	0	0	0	(8,751)	(17,249)	0	(486,841)
2008	0	0	0	(37,602)	0	0	0	(4,816)	(3,679)	(6)	(681,260)
2009	0	(1,706)	(5,168)	(54,948)	(2,788)	(444)	0	0	(7,488)	(11)	(603,933)
2010	0	(1,867)	(4,761)	(32,758)	(2,913)	0	0	0	(2,891)	0	(542,451)
2011	0	0	0	(16,065)	0	0	0	0	0	0	(306,755)
2012	0	(73)	(744)	(10,010)	(405)	0	0	0	0	0	(210,355)
2013	0	(119)	(561)	(12,868)	(87)	0	0	0	0	0	(110,069)
2014	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>(4,926)</b>	<b>(4,161)</b>	<b>(11,476)</b>	<b>(226,368)</b>	<b>(6,193)</b>	<b>(444)</b>	<b>(152)</b>	<b>(13,567)</b>	<b>(31,307)</b>	<b>(870)</b>	<b>(3,697,482)</b>

**TABLE B-5B Annual Water Quantities Delivered to Each Contractor**

(in acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA (a)				CENTRAL COASTAL AREA		
	Napa (b) County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1962	0	0	0	494	8,412	0	8,906	0	0	0
1963	0	0	0	1,731	10,914	0	12,645	0	0	0
1964	0	0	0	1,673	19,238	0	20,911	0	0	0
1965	0	0	0	2,605	16,407	15,014	34,026	0	0	0
1966	0	0	0	5,511	14,864	34,538	54,913	0	0	0
1967	0	0	0	4,780	12,882	39,101	56,763	0	0	0
1968	1,214	0	1,214	6,133	24,817	70,105	101,055	0	0	0
1969	2,687	0	2,687	6,635	813	62,264	69,712	0	0	0
1970	3,618	0	3,618	9,249	0	80,311	89,560	0	0	0
1971	2,521	0	2,521	5,017	5,961	87,606	98,584	0	0	0
1972	3,647	0	3,647	10,489	27,671	100,266	138,426	0	0	0
1973	3,792	0	3,792	2,975	2,521	88,582	94,078	0	0	0
1974	4,870	0	4,870	1,314	4	88,000	89,318	0	0	0
1975	6,840	0	6,840	4,618	986	88,000	93,604	0	0	0
1976	7,122	0	7,122	17,131	21,300	88,000	126,431	0	0	0
1977	8,226	0	8,226	12,644	18,840	76,220	107,704	0	0	0
1978	6,034	0	6,034	10,984	5,863	95,727	112,574	0	0	0
1979	6,561	0	6,561	19,325	10,874	91,991	122,190	0	0	0
1980	6,707	0	6,707	16,790	11,034	88,000	115,824	0	0	0
1981	9,001	0	9,001	19,590	21,917	88,000	129,507	0	0	0
1982	1,213	0	1,213	13,123	6,316	88,000	107,439	0	0	0
1983	2,287	0	2,287	4,766	3,157	86,733	94,656	0	0	0
1984	2,923	0	2,923	6,784	3,338	88,000	98,122	0	0	0
1985	4,039	0	4,039	15,072	19,016	88,000	122,088	0	0	0
1986	3,519	1,400	4,919	10,609	12,379	88,000	110,988	0	0	0
1987	7,693	1,550	9,243	23,406	25,390	88,000	136,796	0	0	0
1988	5,392	9,726	15,118	25,830	33,464	87,961	147,255	0	0	0
1989	6,195	17,256	23,451	26,227	26,042	90,000	142,269	0	0	0
1990	6,940	19,131	26,071	33,034	31,703	92,000	156,737	0	0	0
1991	1,380	6,972	8,352	9,411	12,648	28,200	50,259	0	1,240	1,240
1992	4,001	14,773	18,774	14,669	19,153	42,839	76,661	0	0	0
1993	5,286	29,180	34,466	33,635	10,271	62,065	105,971	0	0	0
1994	6,792	25,256	32,048	20,542	22,911	57,115	100,568	0	0	0
1995	5,182	21,345	26,527	30,091	17,793	28,756	76,640	0	0	0
1996	4,893	29,999	34,892	18,903	19,662	89,850	128,415	100	0	100
1997	4,341	33,530	37,871	27,522	24,063	95,601	147,186	1,199	7,439	8,638
1998	5,359	29,766	35,125	17,941	19,075	63,410	100,426	3,592	18,618	22,210
1999	5,304	34,753	40,057	50,910	37,652	82,945	171,507	3,743	20,137	23,880
2000	4,958	37,015	41,973	58,617	35,978	101,988	196,583	3,962	22,741	26,703
2001	9,345	34,586	43,931	34,409	18,004	77,922	130,335	4,283	18,946	23,229
2002	6,875	38,560	45,435	53,261	27,811	62,186	143,258	4,355	27,636	31,991
2003	7,646	33,951	41,597	45,450	36,590	108,981	191,021	4,453	26,968	31,421
2004	8,134	43,002	51,136	52,364	27,884	95,458	139,706	4,165	29,705	33,870
2005	7,669	37,819	45,488	47,512	44,599	128,249	220,360	4,251	23,344	27,595
2006	7,789	35,516	43,305	54,527	43,079	128,210	225,816	4,209	23,275	27,484
2007	10,957	47,300	58,257	40,157	24,391	75,382	139,930	3,776	27,740	31,516
2008	13,292	41,320	54,612	41,186	22,902	95,160	123,248	3,402	18,393	21,795
2009	10,904	30,950	41,854	31,087	19,496	76,363	126,946	3,801	15,452	19,253
2010	12,417	30,816	43,233	47,343	22,571	107,871	177,785	3,757	17,775	21,532
2011	11,314	27,995	39,309	52,726	36,610	127,237	216,573	3,819	23,598	27,417
2012	9,860	29,394	39,254	55,240	20,831	63,794	139,865	3,944	19,474	23,418
2013	15,344	28,199	43,543	46,881	21,735	75,339	143,955	5,346	22,527	27,873
2014	17,415	28,201	45,616	48,371	25,200	60,000	133,571	4,830	27,292	32,122
2015	17,415	28,654	46,069	48,371	25,200	60,000	133,571	4,830	27,292	32,122
2016	17,415	28,654	46,069	48,371	25,200	60,000	133,571	4,830	27,292	32,122
2017	17,415	28,654	46,069	48,371	25,200	60,000	133,571	4,830	27,292	32,122
2018	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2019	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2020	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2021	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2022	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2023	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2024	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2025	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2026	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2027	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2028	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2029	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2030	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2031	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2032	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2033	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2034	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2035	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
<b>TOTAL</b>	<b>675,213</b>	<b>1,400,995</b>	<b>2,076,208</b>	<b>2,267,085</b>	<b>1,536,232</b>	<b>5,201,340</b>	<b>9,004,657</b>	<b>308,191</b>	<b>965,432</b>	<b>1,273,623</b>

(a) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.

(b) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility.

**TABLE B-5B Annual Water Quantities Delivered to Each Contractor**

(in acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural	Total				
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	26,360	1,978	0	127,384	127,384	900	3,084	25,100	184,806
1969	31,375	56	0	141,265	141,265	100	3,016	9,923	185,735
1970	40,407	3,942	0	204,634	204,634	0	5,911	9,578	264,472
1971	41,053	5,990	0	360,151	360,151	3,700	7,212	122,485	540,591
1972	42,443	5,795	0	490,781	490,781	1,400	8,166	258,393	806,978
1973	22,057	3,000	0	341,469	341,469	1,500	3,214	50,464	421,704
1974	33,390	3,000	23,708	323,292	347,000	1,500	3,471	72,289	460,650
1975	40,555	3,000	14,529	396,291	410,820	1,600	3,576	86,258	545,809
1976	41,421	3,000	46,719	392,531	439,250	1,600	4,112	58,811	548,194
1977	11,153	738	27,882	163,425	191,307	1,530	1,472	18,081	224,281
1978	51,747	454	76,895	590,452	667,347	2,070	3,906	12,053	737,577
1979	38,544	1,739	62,997	683,049	746,046	2,000	6,149	155,121	949,599
1980	41,000	894	45,943	588,557	634,500	2,200	5,700	75,444	759,738
1981	41,000	5,859	75,758	615,642	691,400	2,300	4,300	83,438	828,297
1982	41,000	361	47,477	697,823	745,300	1,750	3,838	18,551	810,800
1983	42,900	0	6,854	587,653	594,507	3,550	3,822	1,006	645,785
1984	45,100	0	90,904	769,696	860,600	3,100	5,700	5,743	920,243
1985	46,251	5,197	88,515	800,381	888,896	3,400	5,433	109,791	1,058,968
1986	50,249	1,170	77,240	829,101	906,341	3,700	5,107	79,355	1,045,922
1987	46,288	2,525	117,174	852,731	969,905	4,000	5,625	93,084	1,121,427
1988	47,994	3,475	122,409	887,111	1,009,520	4,000	4,412	95,866	1,165,267
1989	57,049	3,000	123,896	1,022,166	1,146,062	4,000	6,091	127,950	1,344,152
1990	36,296	1,279	127,837	584,611	712,448	2,000	2,922	57,070	812,015
1991	927	221	33,122	8,965	42,087	0	141	2,180	45,556
1992	23,770	1,354	62,326	420,894	483,220	1,806	2,239	46,728	559,117
1993	50,618	2,741	128,316	1,039,614	1,167,930	4,000	4,858	124,468	1,354,615
1994	28,793	1,666	87,139	570,020	657,159	2,116	3,071	62,362	755,167
1995	60,686	1,631	135,415	1,016,114	1,151,529	4,000	5,169	101,869	1,324,884
1996	56,948	1,868	135,654	1,049,409	1,185,063	4,000	4,904	236,875	1,489,658
1997	71,308	0	120,708	987,451	1,108,159	0	5,238	22,369	1,207,074
1998	55,650	542	89,765	768,825	858,590	15	4,401	20,677	939,875
1999	59,697	3,176	138,153	1,039,985	1,178,138	4,000	4,871	289,735	1,539,617
2000	60,539	1,799	40,697	1,183,440	1,224,137	3,600	4,508	201,294	1,495,877
2001	41,902	1,360	3,116	651,175	654,291	1,560	3,592	84,726	787,431
2002	48,915	1,405	12,589	812,870	825,459	2,854	4,885	96,502	980,020
2003	46,082	1,436	47,070	917,160	964,230	3,692	4,266	105,841	1,125,547
2004	49,080	3,562	126,933	712,193	839,126	9,053	4,629	90,021	995,471
2005	79,005	3,834	69,594	1,328,387	1,397,981	19,806	4,194	140,279	1,645,099
2006	72,080	3,282	98,199	1,164,671	1,262,870	9,530	4,242	108,207	1,460,211
2007	45,135	2,084	79,144	949,601	1,028,745	5,746	3,567	87,083	1,172,360
2008	22,174	947	24,572	702,099	726,671	3,836	1,985	33,904	789,517
2009	21,237	1,034	2,912	773,763	776,675	3,391	1,993	36,836	841,166
2010	27,967	3,259	8,183	689,917	698,100	4,679	2,906	70,238	807,149
2011	60,560	1,915	37,112	1,169,231	1,206,343	6,556	2,715	63,141	1,341,230
2012	30,450	2,242	27,622	791,491	819,113	7,556	3,208	95,717	958,286
2013	29,355	1,532	51,425	509,863	561,288	3,414	2,574	35,536	633,699
2014	30,206	1,800	77,716	511,922	589,638	5,583	3,420	53,353	684,000
2015	28,406	1,800	77,716	511,922	589,638	5,583	3,420	53,353	682,200
2016	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2017	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2018	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2019	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2020	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2021	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2022	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2023	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2024	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2025	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2026	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2027	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2028	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2029	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2030	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2031	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2032	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2033	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2034	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
2035	26,006	1,800	77,716	511,922	589,638	5,583	3,420	53,353	679,800
<b>TOTAL</b>	<b>2,537,242</b>	<b>138,942</b>	<b>4,446,147</b>	<b>42,969,726</b>	<b>47,415,873</b>	<b>279,936</b>	<b>265,635</b>	<b>4,956,208</b>	<b>55,593,836</b>

**TABLE B-5B Annual Water Quantities Delivered to Each Contractor**

(in acre-feet)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency (c)	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	7,382	0	0	0	0	0	0	0	0
1969	0	9,970	0	0	0	0	0	0	0	0
1970	0	11,739	0	0	0	0	0	0	0	0
1971	0	12,490	0	0	0	0	0	0	0	0
1972	53	13,905	0	464	0	338	55	0	1,275	0
1973	20	9,418	5,800	389	9,000	290	0	0	32,426	0
1974	1,259	9,700	6,400	627	10,000	400	14	0	16,605	612
1975	8,068	10,700	7,000	825	11,000	520	0	0	13,865	5,450
1976	27,782	11,700	7,600	1,002	12,000	589	0	0	12,273	6,071
1977	11,202	5,075	0	1,109	0	111	80	0	24,833	8,996
1978	44,137	11,362	10,084	1,209	15,300	208	0	0	4,055	7,771
1979	60,493	19,145	10,063	1,260	15,000	133	4,000	0	18	290
1980	72,407	15,092	10,884	1,239	17,000	191	4,000	0	0	1,085
1981	79,375	18,461	12,105	1,485	19,000	1,270	4,000	0	16,021	3,619
1982	50,291	22,216	13,326	1,238	21,000	0	10,500	0	8,409	12,599
1983	32,961	22,135	14,547	911	23,000	38	0	0	5,994	734
1984	32,662	24,218	15,768	1,128	25,000	1	0	0	5,556	7,656
1985	37,064	24,500	16,989	1,422	27,000	0	0	1,558	7,390	5,028
1986	32,449	27,229	18,210	1,506	29,000	163	0	3,096	6,421	9,454
1987	34,089	27,988	19,431	1,849	31,500	1,085	17	5,379	18,751	10,630
1988	34,079	30,438	20,652	2,006	34,000	419	9	1,770	21,386	8,948
1989	45,280	36,364	21,873	2,170	36,500	971	200	9,009	20,782	12,839
1990	47,206	28,579	23,100	1,827	38,100	1,747	0	8,608	18,831	16,649
1991	9,568	4,562	6,930	849	11,430	522	3,423	3,914	3,661	5,399
1992	30,265	20,699	10,427	519	17,197	251	10,686	4,035	3,358	7,908
1993	43,102	23,039	23,100	439	38,100	734	11,514	7,761	4,361	14,397
1994	49,153	26,441	14,102	785	23,257	1,098	16,852	8,418	9,135	15,230
1995	47,286	27,233	23,100	409	38,100	480	8,722	6,961	6,961	12,922
1996	56,356	32,500	62,219	485	102,622	494	7,427	11,434	6,064	15,989
1997	62,393	27,712	68,340	651	69,990	444	10,374	11,861	9,654	18,175
1998	52,926	20,093	85,709	187	70,647	404	3,925	8,752	1,878	9,310
1999	69,073	32,899	50,480	1,132	58,100	342	8,144	13,278	12,874	21,729
2000	83,577	40,680	42,323	1,194	58,234	0	11,380	9,060	18,399	15,140
2001	62,857	31,939	9,100	1,057	15,010	0	4,433	10,427	26,488	2,360
2002	58,171	68,817	16,755	2,189	27,640	0	4,346	18,496	72,069	24,851
2003	60,029	55,736	14,443	1,563	23,819	0	14,435	11,547	26,113	21,934
2004	59,731	83,761	15,465	2,006	21,190	0	13,176	12,162	57,030	12,541
2005	59,831	59,456	42,519	807	49,089	0	13,561	11,712	31,550	13,984
2006	80,384	62,752	121,100	641	50,000	0	34,014	12,492	35,331	16,284
2007	80,203	60,190	73,228	1,768	30,234	0	46,109	19,634	57,116	4,024
2008	54,436	42,878	46,791	848	26,428	25	25,396	14,255	35,145	7,212
2009	45,670	42,085	46,022	894	18,263	42	29,047	15,339	39,346	11,520
2010	58,489	57,900	85,592	357	31,183	0	38,152	10,969	49,379	19,180
2011	94,046	33,633	90,279	185	36,379	0	5,099	14,333	38,126	23,591
2012	108,548	45,724	114,516	483	43,117	0	11,244	19,056	113,002	22,058
2013	61,861	56,936	48,587	1,401	16,803	636	16,102	11,767	38,297	9,752
2014	84,840	57,120	83,010	3,405	33,450	1,380	49,680	12,780	61,560	17,280
2015	84,840	57,120	83,010	3,480	33,450	1,380	51,480	12,780	61,560	17,280
2016	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2017	84,840	57,120	83,010	3,480	33,450	1,380	53,375	12,780	61,560	17,280
2018	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2019	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2020	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2021	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2022	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2023	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2024	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2025	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2026	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2027	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2028	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2029	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2030	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2031	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2032	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2033	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2034	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2035	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
<b>TOTAL</b>	<b>3,905,312</b>	<b>2,624,111</b>	<b>3,171,179</b>	<b>121,000</b>	<b>1,986,132</b>	<b>44,306</b>	<b>1,548,691</b>	<b>578,243</b>	<b>2,278,283</b>	<b>824,081</b>

(c) Devil's Den Water District merged with Castaic Lake Water Agency effective January 1, 1992.

**TABLE B-5B Annual Water Quantities Delivered to Each Contractor**

(in acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (contd.)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1962	0	0	0	0	0	0	0	0	0	8,906
1963	0	0	0	0	0	0	0	0	0	12,645
1964	0	0	0	0	0	0	0	0	0	20,911
1965	0	0	0	0	0	0	0	0	0	34,026
1966	0	0	0	0	0	0	0	0	0	54,913
1967	0	0	0	0	0	0	0	0	0	56,763
1968	0	0	0	7,382	0	0	0	0	0	294,457
1969	0	0	0	9,970	0	0	0	0	0	268,104
1970	0	0	0	11,739	0	0	70	70	0	369,459
1971	0	0	0	12,490	0	192	64	256	0	654,442
1972	0	71,938	0	88,028	0	186	505	691	0	1,037,770
1973	0	159,883	0	217,226	0	53	679	732	0	737,532
1974	0	277,717	0	323,334	0	127	648	775	0	878,947
1975	0	526,491	0	583,919	0	253	405	658	0	1,230,830
1976	0	618,451	0	697,468	0	527	382	909	0	1,380,124
1977	0	189,755	0	241,161	0	706	303	1,009	0	582,381
1978	0	507,565	0	601,691	0	579	278	857	0	1,458,733
1979	0	477,074	0	587,476	0	302	329	631	0	1,666,457
1980	0	531,727	0	653,625	0	267	295	562	0	1,536,456
1981	0	795,846	0	951,182	0	221	355	576	0	1,918,563
1982	0	691,192	0	830,771	0	334	305	639	0	1,750,862
1983	0	343,521	0	443,841	0	325	262	587	0	1,187,156
1984	0	457,582	0	569,571	108	177	272	557	0	1,591,416
1985	0	683,625	0	804,576	62	308	254	624	0	1,990,295
1986	0	708,840	0	836,368	328	313	317	958	0	1,999,155
1987	0	712,424	0	863,143	88	459	452	999	0	2,131,608
1988	0	902,564	0	1,056,271	303	385	523	1,211	0	2,385,122
1989	0	1,156,698	0	1,342,686	403	300	486	1,189	0	2,853,747
1990	0	1,396,423	4,836	1,585,906	494	380	548	1,422	0	2,582,151
1991	0	391,447	988	442,693	265	328	420	1,013	0	549,113
1992	0	710,313	0	815,658	642	117	485	1,244	0	1,471,454
1993	0	652,190	0	818,737	746	256	444	1,446	0	2,315,235
1994	0	807,866	0	972,337	1,035	329	492	1,856	0	1,861,976
1995	0	436,042	0	601,951	910	203	308	1,421	0	2,031,423
1996	0	593,380	0	888,970	820	257	360	1,437	0	2,543,472
1997	0	721,810	1,850	1,003,254	1,005	185	231	1,421	0	2,405,444
1998	0	410,065	1,850	665,746	1,054	527	0	1,581	0	1,764,963
1999	0	852,617	1,850	1,122,518	1,096	286	0	1,382	0	2,898,961
2000	0	1,522,412	4,050	1,806,449	901	586	0	1,487	0	3,569,072
2001	0	1,023,169	1,850	1,188,690	1,065	513	0	1,578	0	2,175,194
2002	0	1,408,919	4,998	1,707,251	1,181	419	0	1,600	0	2,909,555
2003	116	1,701,615	5,000	1,936,350	1,324	551	0	1,875	0	3,327,811
2004	841	1,724,380	5,250	2,007,533	1,434	1,440	0	2,874	0	3,230,590
2005	692	1,528,045	1,665	1,812,911	1,894	527	0	2,421	0	3,753,874
2006	4,278	1,512,186	1,850	1,931,312	5,342	468	0	5,810	0	3,693,938
2007	3,935	1,499,688	3,000	1,879,129	2,327	956	0	3,283	0	3,284,475
2008	4,905	898,313	3,798	1,160,430	1,923	451	243	2,617	0	2,152,219
2009	6,397	930,871	3,891	1,189,387	2,114	581	200	2,895	0	2,221,501
2010	8,240	1,416,062	4,075	1,779,578	2,331	807	243	3,381	0	2,832,658
2011	10,503	1,686,570	4,000	2,036,744	2,297	1,092	98	3,487	0	3,664,760
2012	11,010	1,228,555	4,353	1,721,666	2,695	1,374	79	4,148	0	2,886,637
2013	9,008	839,600	2,890	1,113,640	4,630	764	665	6,059	0	1,968,769
2014	10,380	1,146,900	12,000	1,573,785	5,760	1,600	1,500	8,860	0	2,477,954
2015	10,380	1,146,900	12,000	1,575,660	5,760	1,600	1,562	8,922	0	2,478,544
2016	10,380	1,146,900	12,000	1,578,060	5,760	1,600	1,619	8,979	0	2,478,601
2017	10,380	1,146,900	12,000	1,577,555	5,760	1,600	1,619	8,979	0	2,478,096
2018	10,380	1,146,900	9,000	1,575,060	5,760	1,736	1,619	9,115	0	2,483,280
2019	10,380	1,146,900	9,000	1,575,060	5,760	1,786	1,619	9,165	0	2,483,330
2020	10,380	1,146,900	9,000	1,575,060	5,760	1,846	1,619	9,225	0	2,483,390
2021	10,380	1,146,900	9,000	1,575,060	5,760	1,911	1,619	9,290	0	2,483,455
2022	10,380	1,146,900	9,000	1,575,060	5,760	1,982	1,619	9,361	0	2,483,526
2023	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2024	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2025	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2026	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2027	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2028	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2029	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2030	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2031	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2032	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2033	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2034	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2035	10,380	1,146,900	9,000	1,575,060	5,760	2,143	1,619	9,522	0	2,483,687
<b>TOTAL</b>	<b>288,285</b>	<b>60,937,231</b>	<b>272,044</b>	<b>78,578,898</b>	<b>167,537</b>	<b>61,947</b>	<b>47,442</b>	<b>276,926</b>	<b>0</b>	<b>146,804,148</b>



**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 1 of 10

Calendar Year	NORTH BAY AQUEDUCT											
	Barker Slough Pumping Plant				Cordelia Pumping Plant Solano County WA				Cordelia Pumping Plant Napa County FC&WCD			
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery (a)	Total
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	24	(10)	1,214	1,228
1969	0	0	0	0	0	0	0	0	0	2	2,687	2,689
1970	0	0	0	0	0	0	0	0	0	18	3,618	3,636
1971	0	0	0	0	0	0	0	0	0	4	2,521	2,525
1972	0	0	0	0	0	0	0	0	0	(10)	3,647	3,637
1973	0	0	0	0	0	0	0	0	0	1	3,792	3,793
1974	0	0	0	0	0	0	0	0	0	10	4,870	4,880
1975	0	0	0	0	0	0	0	0	0	10	6,840	6,850
1976	0	0	0	0	0	0	0	0	0	4	7,122	7,126
1977	0	0	0	0	0	0	0	0	0	2	8,226	8,228
1978	0	0	0	0	0	0	0	0	0	(6)	6,034	6,028
1979	0	0	0	0	0	0	0	0	0	1	6,561	6,562
1980	0	0	0	0	0	0	0	0	0	(3)	6,707	6,704
1981	0	0	0	0	0	0	0	0	0	8	9,001	9,009
1982	0	0	0	0	0	0	0	0	0	(8)	1,213	1,205
1983	0	0	0	0	0	0	0	0	0	(12)	2,287	2,275
1984	0	0	0	0	0	0	0	0	0	(15)	2,923	2,908
1985	0	0	0	0	0	0	0	0	0	13	4,039	4,052
1986	0	0	0	0	0	0	0	0	0	(4)	3,519	3,515
1987	0	0	0	0	0	0	0	0	0	0	7,693	7,693
1988	1	283	15,118	15,402	0	0	9,725	9,725	1	(1)	5,392	5,392
1989	0	758	23,451	24,209	0	0	17,246	17,246	0	(4)	6,195	6,191
1990	0	3	26,071	26,074	0	(634)	15,856	15,222	0	3	6,940	6,943
1991	0	667	8,352	9,019	0	124	3,855	3,979	0	198	1,380	1,578
1992	0	1,643	18,774	20,417	0	0	9,220	9,220	0	0	4,001	4,001
1993	0	1,153	34,466	35,619	0	0	14,471	14,471	0	0	5,286	5,286
1994	0	780	32,048	32,828	0	(6)	14,913	14,907	0	0	6,792	6,792
1995	0	908	26,527	27,435	0	0	15,893	15,893	0	0	5,182	5,182
1996	0	1,354	34,892	36,246	0	0	17,069	17,069	0	0	4,893	4,893
1997	0	1,422	37,871	39,293	0	0	17,501	17,501	0	0	4,341	4,341
1998	0	1,343	35,125	36,468	0	0	18,204	18,204	0	0	5,359	5,359
1999	0	2,522	40,057	42,579	0	0	19,562	19,562	0	0	5,304	5,304
2000	0	1,853	31,738	33,591	0	4	21,525	21,529	0	180	4,958	5,138
2001	0	1,760	35,571	37,331	0	0	19,737	19,737	0	0	9,345	9,345
2002	0	496	36,846	37,342	0	0	19,719	19,719	0	0	6,875	6,875
2003	0	3,991	34,579	38,570	0	0	16,700	16,700	0	0	7,637	7,637
2004	0	2,181	40,141	42,322	0	0	21,686	21,686	0	0	8,499	8,499
2005	0	935	36,884	37,819	0	0	19,189	19,189	0	0	8,009	8,009
2006	0	1,005	35,519	36,524	0	0	18,651	18,651	0	0	8,081	8,081
2007	0	1,189	42,765	43,954	0	0	27,793	27,793	0	0	11,277	11,277
2008	0	845	46,601	47,446	0	0	19,436	19,436	0	255	13,740	13,995
2009	0	537	35,032	35,569	0	0	15,473	15,473	0	130	11,377	11,507
2010	0	809	38,676	39,485	0	0	12,788	12,788	0	254	12,847	13,101
2011	0	803	34,238	35,041	0	0	12,832	12,832	0	213	11,275	11,488
2012	0	686	34,666	35,352	0	0	12,886	12,886	0	196	9,860	10,056
2013	0	51	34,974	35,025	0	0	15,242	15,242	0	5	15,344	15,349
2014	0	51	45,616	45,667	0	0	6,130	6,130	0	5	17,415	17,420
2015	0	51	46,069	46,120	0	0	13,054	13,054	0	5	17,415	17,420
2016	0	51	46,069	46,120	0	0	12,571	12,571	0	5	17,415	17,420
2017	0	51	46,069	46,120	0	0	12,554	12,554	0	5	17,415	17,420
2018	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2019	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2020	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2021	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2022	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2023	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2024	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2025	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2026	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2027	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2028	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2029	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2030	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2031	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2032	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2033	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2034	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2035	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420

(a) For the period 1968 through 1987, deliveries are non-SWP water pumped through an interim facility.

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 2 of 10

Calendar  Year	SOUTH BAY AQUEDUCT						CALIFORNIA AQUEDUCT								
	South Bay Pumping Plant						North San Joaquin Division Banks Pumping Plant								
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Conservation Water	Total	
				Water Supply (b)	Recreation					Water Supply	Recreation				
[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]		
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1962	9	272	0	8,906	0	9,187	0	0	0	0	0	0	0	0	
1963	71	185	0	12,645	0	12,901	0	0	0	0	0	0	0	0	
1964	171	152	0	20,911	0	21,234	0	0	0	0	0	0	0	0	
1965	93	729	0	34,026	0	34,848	0	0	0	0	0	0	0	0	
1966	0	1,746	0	54,913	0	56,659	0	0	0	0	0	0	0	0	
1967	0	1,677	0	56,763	0	58,440	5,746	1,183	0	11,538	0	18,467	2,957	21,424	
1968	0	1,847	0	101,055	0	102,902	11,079	74,464	0	293,243	0	378,786	531,275	910,061	
1969	3,449	2,668	0	69,712	0	75,829	7,336	44,287	0	265,417	0	317,040	531,185	848,225	
1970	16,279	1,086	(5,355)	89,560	0	101,570	23,947	20,767	(5,355)	365,771	0	405,130	(12,995)	392,135	
1971	0	1,815	8,854	98,584	0	109,253	23,207	(10,754)	8,854	651,665	8	672,980	7,708	680,688	
1972	0	3,557	2,273	138,426	0	144,256	145,066	9,057	(4,285)	1,033,432	6,489	1,189,759	48,300	1,238,059	
1973	0	(33)	(1,510)	94,078	0	92,535	214,941	(4,951)	2,902	733,008	1,155	947,055	55,846	1,002,901	
1974	0	1,287	(10,056)	89,318	0	80,549	247,894	(11,526)	(32,510)	873,302	2,118	1,079,278	54,683	1,133,961	
1975	0	320	8,550	93,604	0	102,474	110,149	(8,092)	16,101	1,223,332	3,377	1,344,867	(102,625)	1,242,242	
1976	0	2,431	1,391	126,431	141	130,394	67,834	5,443	(244,124)	1,372,093	1,745	1,202,991	(442,348)	760,643	
1977	0	2,866	2,685	107,704	112	113,367	0	39,897	(157,543)	573,146	1,111	456,611	(13,507)	443,104	
1978	0	2,165	(11,249)	112,574	126	103,616	67,457	(36,898)	35,129	1,451,842	1,177	1,518,707	752,075	2,270,782	
1979	0	2,401	1,069	122,190	89	125,749	17,397	60,958	(32,307)	1,659,265	1,398	1,706,711	(112,053)	1,594,658	
1980	0	1,758	(6,563)	115,824	123	111,142	3,159	58,484	(275,538)	1,529,187	2,131	1,317,423	186,601	1,504,024	
1981	0	2,627	13,742	129,507	121	145,997	46,060	85,350	40,536	1,908,986	4,974	2,085,906	(931,878)	1,154,028	
1982	0	2,344	(23,928)	107,439	129	95,984	5,979	61,556	99,897	1,743,145	4,646	1,915,223	347,983	2,263,206	
1983	0	2,151	(22,886)	94,656	132	74,053	6,071	47,022	(310,477)	1,184,282	7,853	934,751	835,771	1,770,522	
1984	0	2,088	8,442	98,122	158	108,810	38,649	97,143	(108,548)	1,587,936	5,874	1,621,054	21,875	1,642,929	
1985	0	2,817	(1,607)	122,088	152	123,450	0	110,469	137,783	1,985,632	5,452	2,239,336	(110,569)	2,128,767	
1986	0	2,299	(1,850)	110,988	130	111,567	0	90,799	20,177	1,993,278	3,865	2,108,119	200,298	2,308,417	
1987	0	2,625	(584)	136,796	137	138,974	0	91,427	(23,116)	2,121,366	7,672	2,197,349	(458,725)	1,738,624	
1988	0	2,884	(698)	147,255	142	149,583	0	107,249	(35,484)	2,368,793	4,889	2,445,447	(303,583)	2,141,864	
1989	0	2,673	3,296	142,269	152	148,390	0	117,603	(38,058)	2,829,107	8,135	2,916,787	421,131	3,337,918	
1990	0	894	1,982	156,537	168	159,581	0	99,059	(290,965)	2,554,658	9,262	2,372,014	(374,027)	1,997,987	
1991	0	2,637	(4,532)	50,259	150	48,514	0	80,106	(79,038)	539,748	4,879	545,695	554,904	1,100,599	
1992	0	2,881	756	76,661	147	80,445	0	91,391	(218,170)	1,451,436	2,609	1,327,262	61,343	1,388,605	
1993	0	1,940	(20,051)	105,971	143	88,003	0	149,372	(273,789)	2,279,323	2,605	2,157,515	849,249	3,006,764	
1994	0	1,981	1,714	100,568	168	104,431	0	148,712	(120,985)	1,828,072	3,803	1,859,602	(324,640)	1,534,962	
1995	0	1,188	(12,333)	76,640	146	65,641	0	173,074	(397,605)	2,003,475	2,575	1,781,519	293,159	2,074,678	
1996	0	981	(1,990)	77,215	150	76,356	0	123,502	78,123	2,507,143	3,902	2,712,670	288,576	3,001,246	
1997	0	1,575	5,016	102,186	155	108,932	527	135,106	(98,334)	2,366,152	2,594	2,406,045	(50,000)	2,356,045	
1998	0	1,551	3,595	70,876	114	76,136	0	91,319	(346,039)	1,728,257	2,107	1,475,644	120,886	1,596,530	
1999	0	2,166	12,313	100,497	139	115,115	0	135,809	(17,569)	2,855,522	4,301	2,978,063	(307,839)	2,670,224	
2000	0	2,346	(20,958)	135,533	145	117,066	0	115,895	(13,232)	3,474,523	5,182	3,582,368	(15,878)	3,566,881	
2001	0	2,784	1,301	95,335	196	99,616	0	222,144	(17,529)	1,874,096	1,978	2,080,689	86,928	2,167,617	
2002	0	2,534	(13,938)	123,577	146	112,319	0	225,032	96,404	2,816,399	4,672	3,082,497	(151,719)	2,930,778	
2003	0	2,920	(1,399)	132,714	131	134,366	0	329,699	(49,580)	3,193,449	11,362	3,484,930	225,348	3,710,279	
2004	0	2,982	(7,240)	128,928	150	121,820	0	83,788	(4,079)	2,979,217	1,337	3,060,263	103,811	3,164,074	
2005	0	2,823	(3,565)	108,136	154	107,548	0	151,931	(163,243)	3,665,023	1,270	3,654,981	535,754	4,190,735	
2006	0	2,989	(9,645)	118,272	169	111,785	0	67,040	(129,767)	3,571,009	1,208	3,509,490	43,481	3,552,971	
2007	0	2,840	14,928	134,172	146	152,086	0	73,956	133,124	2,736,094	830	2,944,004	(398,297)	2,545,707	
2008	0	2,215	880	116,562	166	119,823	0	130,066	(3,350)	1,413,730	1,082	1,541,528	(397,949)	1,143,579	
2009	0	1,999	(1,134)	116,947	108	117,920	0	111,805	(1,860)	1,572,819	2,023	1,684,787	928,666	2,613,453	
2010	0	1,717	3,436	95,802	117	101,072	0	203,757	51,667	2,243,593	1,163	2,500,180	37,606	2,537,786	
2011	0	1,534	(2,332)	112,952	122	112,276	0	314,282	(21,148)	3,315,209	1,588	3,609,931	165,312	3,775,243	
2012	0	2,025	5,931	112,056	150	120,162	0	146,602	20,504	2,632,880	1,617	2,801,603	(473,745)	2,327,858	
2013	0	(2,619)	(3,877)	143,955	400	137,859	0	25,926	23,117	1,809,098	8,660	1,866,801	99,556	1,966,357	
2014	0	<b>(2,615)</b>	<b>128</b>	<b>120,885</b>	<b>400</b>	<b>118,798</b>	0	<b>71,727</b>	<b>(1,875)</b>	<b>2,423,478</b>	<b>8,660</b>	<b>2,501,990</b>	<b>343,972</b>	<b>2,845,962</b>	
2015	0	(2,615)	128	132,009	400	129,922	0	71,756	118	2,423,553	8,660	2,504,087	166,550	2,670,637	
2016	0	3,351	0	132,009	400	135,760	0	128,415	(28,401)	2,423,553	8,660	2,532,227	205,134	2,737,361	
2017	0	3,351	0	132,009	400	135,760	0	128,602	61,309	2,423,048	8,660	2,621,619	119,885	2,741,504	
2018	0	3,351	0	133,571	400	137,322	0	128,369	(80,817)	2,428,096	8,660	2,484,308	(194,534)	2,289,774	
2019	0	3,351	0	133,571	400	137,322	0	128,613	50,179	2,428,096	8,660	2,615,548	77,224	2,692,772	
2020	0	3,351	0	133,571	400	137,322	0	128,690	(366)	2,428,096	8,660	2,565,080	(8,687)	2,556,393	
2021	0	3,351	0	133,571	400	137,322	0	128,769	10,725	2,428,096	8,660	2,576,250	(1,095)	2,575,155	
2022	0	3,351	0	133,571	400	137,322	0	128,846	(3,483)	2,428,096	8,660	2,562,119	(185,907)	2,376,212	
2023	0	3,351	0	133,571	400	137,322	0	128,818	(18,971)	2,428,096	8,660	2,546,603	115,791	2,662,394	
2024	0	3,351	0	133,571	400	137,322	0	128,625	11,289	2,428,096	8,660	2,576,670	79,858	2,656,528	
2025	0	3,351	0	133,571	400	137,322	0	130,380	(12,518)	2,428,096	8,660	2,554,618	(247,205)	2,307,413	
2026	0	3,351	0	133,571	400	137,322	0	128,700	24,308	2,428,096	8,660	2,589,764	246,850	2,836,614	
2027	0	3,351	0	133,571	400	137,322	0	128,692	(17,799)	2,428,096	8,660	2,547,649	(12,304)	2,535,345	
2028	0	3,351	0	133,571	400	137,322	0	128,783	12,291	2,428,096	8,660	2,577,830	15,430	2,593,260	
2029	0	3,351	0	133,571	400	137,322	0	128,671	(9,046)	2,428,096	8,660	2,556,381	(10,778)	2,545,603	
2030	0	3,351	0	133,571	400	137,322	0	128,777	20,756	2,428,096	8,660	2,586,289	124,586	2,710,875	
2031	0	3,351	0	133,571	400	137,322	0	128,134	(97,726)	2,428,096	8,660	2,467,164	(259,831)	2,207,333	
2032	0	3,351	0	133,571	400	137,322	0	128,005	84,999	2,428,096	8,660	2,649,760	138,527	2,788,287	
2033	0	3,351	0	133,571	400	137,322	0	127,876	(94,652)	2,428,096	8,660	2,469,980	(184,372)	2,285,608	
2034	0	3,351	0	133,571	400	137,322	0	127,725	69,593	2,428,096	8,660	2,634,074	120,375	2,754,449	
2035	0	3,351	0	133,571	400	137,322	0								

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 3 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	San Luis Division						South San Joaquin Division					
	Dos Amigos Pumping Plant						Buena Vista Pumping Plant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
1961	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	11,079	25,126	0	189,104	0	225,309	0	0	0	0	0	0
1969	3,887	9,922	0	192,689	0	206,498	0	0	0	0	0	0
1970	7,668	1,901	0	270,300	0	279,869	4,779	1,012	0	3	0	5,794
1971	23,207	(12,030)	0	545,869	0	557,046	7,853	8,399	0	101,512	0	117,764
1972	145,066	(6,635)	(6,558)	886,840	6,481	1,025,194	100,274	20,044	(6,558)	223,626	6,481	343,867
1973	214,941	(6,778)	1,329	635,716	1,147	846,355	204,638	35,695	1,329	311,096	1,147	553,905
1974	247,894	(16,765)	(15,295)	780,513	2,108	998,455	237,554	19,672	(15,295)	388,949	2,108	632,988
1975	110,149	(12,144)	(693)	1,126,152	3,358	1,226,822	103,352	26,342	(693)	672,531	3,358	804,890
1976	67,834	(456)	(152,171)	1,241,550	1,581	1,158,338	61,122	29,428	(152,171)	785,055	1,581	725,015
1977	0	26,359	(116,219)	463,970	737	374,847	0	25,173	(116,219)	271,944	560	181,458
1978	67,457	1,905	79,308	1,335,362	680	1,484,712	65,027	17,751	121,904	762,043	674	967,399
1979	17,397	33,884	(51,299)	1,530,926	685	1,531,593	12,302	46,157	(51,299)	737,714	502	745,376
1980	3,159	34,391	(272,825)	1,407,663	1,514	1,173,902	0	49,025	(134,009)	778,059	1,262	694,337
1981	46,060	36,962	23,359	1,775,179	4,348	1,885,908	0	38,942	23,359	1,077,322	4,112	1,143,735
1982	5,979	57,146	116,086	1,631,868	4,205	1,815,284	0	29,059	117,174	990,863	4,045	1,141,141
1983	6,071	63,583	(101,155)	1,085,804	7,475	1,061,778	0	40,205	(101,155)	593,920	7,291	540,261
1984	38,649	109,263	(112,744)	1,484,114	5,391	1,524,673	0	38,487	(114,984)	781,955	5,244	710,702
1985	0	86,772	138,898	1,858,111	4,936	2,088,717	0	42,838	139,689	992,606	4,804	1,179,937
1986	0	51,963	19,989	1,877,183	3,426	1,952,561	0	36,751	37,546	1,014,294	3,285	1,091,876
1987	0	64,827	(25,707)	1,978,945	7,121	2,025,186	0	30,495	(25,522)	1,027,361	6,937	1,039,271
1988	0	72,679	(34,592)	2,217,126	4,490	2,259,703	0	38,804	(29,747)	1,244,196	4,360	1,257,613
1989	0	90,090	(29,411)	2,679,845	7,652	2,748,176	0	29,594	(60,826)	1,532,625	7,490	1,508,883
1990	0	115,074	(11,323)	2,394,999	8,922	2,507,672	0	46,865	(15,092)	1,769,991	8,879	1,810,643
1991	0	92,227	9,325	489,348	4,605	595,505	0	39,274	96,506	446,916	4,560	587,256
1992	0	118,796	(225,603)	1,372,536	2,079	1,267,808	0	28,138	(98,271)	920,978	1,995	852,840
1993	0	136,432	(220,537)	2,170,494	1,864	2,088,253	0	14,186	(128,363)	908,200	1,676	795,699
1994	0	152,414	(78,957)	1,724,433	3,098	1,800,988	0	35,083	(88,211)	1,107,122	2,918	1,056,912
1995	0	137,937	(12,473)	1,921,666	1,711	2,048,841	0	33,963	(16,431)	706,742	1,669	725,943
1996	0	45,591	14,927	2,425,024	2,998	2,488,540	0	31,304	15,438	988,612	2,928	1,038,282
1997	527	107,033	(66,814)	2,247,628	2,090	2,290,464	0	42,670	40,852	1,054,461	2,076	1,140,059
1998	0	95,185	(338,076)	1,664,080	1,589	1,422,778	0	41,910	(106,487)	753,791	1,585	690,739
1999	0	95,262	(2,778)	2,750,154	3,285	2,845,923	0	48,502	(2,807)	1,131,826	3,279	1,180,800
2000	0	134,231	7,726	3,273,337	4,222	3,419,516	0	37,514	7,726	1,814,685	4,216	1,864,141
2001	0	150,830	(18,830)	1,615,776	1,218	1,748,994	0	31,361	(18,830)	1,318,835	1,211	1,362,577
2002	0	92,905	50,342	2,628,462	3,968	2,775,677	0	41,565	50,342	1,831,874	3,961	1,927,742
2003	0	85,360	(48,181)	2,893,333	10,656	2,941,168	0	43,352	(48,181)	1,909,192	10,645	1,915,008
2004	0	25,865	3,161	2,807,825	652	2,837,503	0	41,551	3,161	2,102,371	649	2,147,732
2005	0	62,569	(159,678)	3,423,490	581	3,326,962	0	35,019	(159,678)	1,846,180	559	1,722,080
2006	0	(12,341)	(120,122)	3,501,308	504	3,369,349	0	30,271	(120,122)	2,077,130	504	1,987,783
2007	0	47,736	118,196	2,419,032	312	2,585,276	0	43,400	118,196	2,002,793	305	2,164,694
2008	0	103,375	(4,230)	1,296,068	361	1,395,574	0	39,056	(4,230)	1,275,174	327	1,310,327
2009	0	76,206	(726)	1,318,452	1,367	1,395,299	0	32,900	(726)	1,217,847	1,295	1,251,316
2010	0	76,447	48,231	2,307,963	636	2,433,277	0	43,377	48,231	1,505,105	603	1,597,316
2011	0	66,937	(18,816)	3,344,113	870	3,393,104	0	39,914	(18,816)	1,819,979	742	1,841,819
2012	0	117,480	14,573	2,542,765	942	2,675,760	0	95,031	14,573	1,672,154	938	1,782,696
2013	0	17,935	26,994	1,657,109	7,210	1,709,248	0	(11,527)	26,994	1,231,099	7,010	1,253,576
2014	0	<b>17,938</b>	<b>(2,003)</b>	<b>2,297,873</b>	<b>7,210</b>	<b>2,321,018</b>	0	<b>(11,524)</b>	<b>(2,003)</b>	<b>1,630,660</b>	<b>7,010</b>	<b>1,624,143</b>
2015	0	17,931	(10)	2,286,824	7,210	2,311,955	0	(11,531)	(10)	1,632,535	7,010	1,628,200
2016	0	70,354	(28,401)	2,286,824	7,210	2,335,987	0	40,892	(28,401)	1,634,935	7,010	1,654,436
2017	0	70,586	61,309	2,286,319	7,210	2,425,424	0	41,124	61,309	1,634,430	7,010	1,743,873
2018	0	70,740	(80,817)	2,289,934	7,210	2,287,067	0	41,278	(80,817)	1,645,059	7,010	1,612,530
2019	0	70,564	50,179	2,289,934	7,210	2,417,887	0	41,102	50,179	1,644,359	7,010	1,742,650
2020	0	70,628	(366)	2,289,934	7,210	2,367,406	0	41,166	(366)	1,644,659	7,010	1,692,469
2021	0	70,711	10,725	2,289,934	7,210	2,378,580	0	41,249	10,725	1,645,459	7,010	1,704,443
2022	0	70,705	(3,483)	2,289,934	7,210	2,364,366	0	41,243	(3,483)	1,646,359	7,010	1,691,129
2023	0	70,696	(18,971)	2,289,934	7,210	2,348,869	0	41,234	(18,971)	1,647,159	7,010	1,676,432
2024	0	70,575	11,289	2,289,934	7,210	2,379,008	0	41,113	11,289	1,648,059	7,010	1,707,471
2025	0	70,638	(12,518)	2,289,934	7,210	2,355,264	0	41,176	(12,518)	1,648,859	7,010	1,684,527
2026	0	70,650	24,308	2,289,934	7,210	2,392,102	0	41,188	24,308	1,649,359	7,010	1,721,865
2027	0	70,563	(17,799)	2,289,934	7,210	2,349,908	0	41,101	(17,799)	1,649,959	7,010	1,680,271
2028	0	70,703	12,291	2,289,934	7,210	2,380,138	0	41,241	12,291	1,650,459	7,010	1,711,001
2029	0	70,630	(9,046)	2,289,934	7,210	2,358,728	0	41,168	(9,046)	1,651,159	7,010	1,690,291
2030	0	70,694	20,756	2,289,934	7,210	2,388,594	0	41,232	20,756	1,651,759	7,010	1,720,757
2031	0	70,566	(97,726)	2,289,934	7,210	2,269,984	0	41,104	(97,726)	1,652,659	7,010	1,603,047
2032	0	70,168	84,999	2,289,934	7,210	2,452,311	0	40,706	84,999	1,653,459	7,010	1,786,174
2033	0	70,373	(94,652)	2,289,934	7,210	2,272,865	0	40,911	(94,652)	1,654,259	7,010	1,607,528
2034	0	69,865	69,593	2,289,934	7,210	2,436,602	0	40,403	69,593	1,655,059	7,010	1,772,065
2035	0	69,205	(242,659)	2,289,934	7,210	2,123,690	0	39,743	(242,659)	1,655,859	7,010	1,459,953

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 4 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	South San Joaquin Division (continued)											
	Teerink Pumping Plant						Chrisman Pumping Plant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
1961	[39] 0	[40] 0	[41] 0	[42] 0	[43] 0	[44] 0	[45] 0	[46] 0	[47] 0	[48] 0	[49] 0	[50] 0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	198	2	0	0	0	200	0	0	0	0	0	0
1971	7,533	(112)	0	3,552	0	10,973	7,366	(159)	0	0	0	7,207
1972	100,274	12,765	(6,558)	84,955	6,481	197,917	100,274	13,160	(6,558)	78,891	6,481	192,248
1973	204,638	21,543	1,329	229,685	1,147	458,342	204,638	32,414	1,329	209,769	1,147	449,297
1974	237,554	11,843	(15,295)	336,198	2,108	572,408	237,554	17,655	(15,295)	318,198	2,108	560,220
1975	103,352	19,763	(693)	621,706	3,358	747,486	103,352	25,326	(693)	586,286	3,358	717,629
1976	61,122	18,552	(152,171)	740,486	1,581	669,570	61,122	21,468	(152,171)	700,935	1,581	632,935
1977	0	16,415	(116,219)	246,349	560	147,105	0	15,698	(116,219)	240,191	560	140,230
1978	65,027	28,820	121,904	631,121	674	847,546	65,027	26,705	121,904	599,973	674	814,283
1979	12,302	50,663	(51,299)	625,561	502	637,729	12,302	50,580	(51,299)	586,959	502	599,044
1980	0	48,825	(134,009)	696,405	1,262	612,483	0	58,085	(134,009)	658,588	1,262	583,926
1981	0	51,600	23,359	998,307	4,112	1,077,378	0	48,844	23,359	959,274	4,112	1,035,589
1982	0	44,353	117,332	878,486	4,045	1,044,216	0	33,541	117,277	830,704	4,045	985,567
1983	0	43,961	(101,155)	487,915	7,291	438,012	0	34,698	(101,155)	450,489	7,291	391,323
1984	0	45,999	(115,088)	632,262	5,244	568,417	0	33,132	(115,092)	582,414	5,244	505,698
1985	0	50,106	139,973	854,684	4,804	1,049,567	0	54,831	139,954	810,606	4,804	1,010,195
1986	0	38,747	37,546	882,300	3,285	961,878	0	41,421	37,546	839,839	3,285	922,091
1987	0	47,815	(25,522)	897,905	6,937	927,135	0	33,195	(25,522)	863,157	6,937	877,767
1988	0	53,815	(29,747)	1,097,643	4,360	1,126,071	0	39,775	(29,747)	1,055,649	4,360	1,070,037
1989	0	49,088	(60,826)	1,382,599	7,490	1,378,351	0	42,307	(60,826)	1,339,358	7,490	1,328,329
1990	0	66,868	(15,092)	1,627,246	8,879	1,687,901	0	56,663	(15,092)	1,590,893	8,879	1,641,343
1991	0	40,564	105,176	446,148	4,560	596,448	0	34,016	105,176	446,148	4,560	589,900
1992	0	31,820	(92,123)	844,376	1,995	786,068	0	34,477	(92,123)	820,133	1,995	764,482
1993	0	27,158	(127,738)	799,143	1,676	700,239	0	28,614	(127,738)	771,146	1,676	673,698
1994	0	50,802	(88,211)	1,007,214	2,918	972,723	0	57,203	(88,211)	977,703	2,918	949,613
1995	0	48,705	(16,431)	586,829	1,669	620,772	0	36,309	(16,431)	560,695	1,669	582,242
1996	0	58,437	15,438	836,819	2,928	913,622	0	43,710	15,438	800,633	2,928	862,709
1997	0	73,656	40,852	918,124	2,076	1,034,708	0	62,275	40,852	881,843	2,076	987,046
1998	0	61,137	(106,487)	656,796	1,585	613,031	0	47,523	(106,487)	628,084	1,585	570,705
1999	0	77,334	(2,807)	1,011,608	3,279	1,089,414	0	55,514	(2,807)	974,807	3,279	1,030,793
2000	0	87,084	7,726	1,691,120	4,216	1,790,146	0	49,690	7,726	1,651,057	4,216	1,712,689
2001	0	71,588	(18,830)	1,233,862	1,211	1,287,831	0	54,742	(18,830)	1,202,670	1,211	1,239,793
2002	0	108,309	50,342	1,740,813	3,961	1,903,425	0	69,443	50,342	1,699,261	3,961	1,823,007
2003	0	106,973	(48,181)	1,825,617	10,645	1,895,054	0	57,291	(48,181)	1,789,015	10,645	1,808,770
2004	0	122,559	3,161	2,032,528	649	2,158,897	0	60,847	3,161	1,992,344	649	2,057,001
2005	0	99,523	(159,678)	1,751,799	559	1,692,203	0	53,502	(159,678)	1,711,929	559	1,606,312
2006	0	128,022	(120,122)	1,967,163	504	1,975,567	0	46,463	(120,122)	1,920,919	504	1,847,764
2007	0	139,502	118,196	1,910,800	305	2,188,803	0	59,454	118,196	1,863,410	305	2,041,365
2008	0	97,209	(4,230)	1,201,345	327	1,294,651	0	51,709	(4,230)	1,168,316	327	1,216,122
2009	0	88,574	(726)	1,169,477	1,295	1,258,620	0	43,229	(726)	1,146,258	1,295	1,190,056
2010	0	92,345	48,231	1,409,122	603	1,550,301	0	59,808	48,231	1,389,990	603	1,498,632
2011	0	114,286	(18,816)	1,695,667	742	1,791,879	0	67,210	(18,816)	1,653,509	742	1,702,645
2012	0	114,531	14,573	1,537,361	938	1,667,403	0	78,121	14,573	1,509,846	938	1,603,478
2013	0	(15,157)	26,994	1,153,652	7,010	1,172,499	0	(15,407)	26,994	1,131,753	7,010	1,150,350
2014	0	(15,154)	(2,003)	1,552,151	7,010	1,542,004	0	(15,404)	(2,003)	1,529,151	7,010	1,518,754
2015	0	(15,161)	(10)	1,554,026	7,010	1,545,865	0	(15,411)	(10)	1,531,026	7,010	1,522,615
2016	0	37,262	(28,401)	1,556,426	7,010	1,572,297	0	37,012	(28,401)	1,533,426	7,010	1,549,047
2017	0	37,494	61,309	1,555,921	7,010	1,661,734	0	37,244	61,309	1,532,921	7,010	1,638,484
2018	0	37,648	(80,817)	1,567,559	7,010	1,531,400	0	37,398	(80,817)	1,540,406	7,010	1,503,997
2019	0	37,472	50,179	1,566,859	7,010	1,661,520	0	37,222	50,179	1,539,706	7,010	1,634,117
2020	0	37,536	(366)	1,567,159	7,010	1,611,339	0	37,286	(366)	1,540,006	7,010	1,583,936
2021	0	37,619	10,725	1,567,959	7,010	1,623,313	0	37,369	10,725	1,540,806	7,010	1,595,910
2022	0	37,613	(3,483)	1,568,859	7,010	1,609,999	0	37,363	(3,483)	1,541,706	7,010	1,582,596
2023	0	37,604	(18,971)	1,569,659	7,010	1,595,302	0	37,354	(18,971)	1,542,506	7,010	1,567,899
2024	0	37,483	11,289	1,570,559	7,010	1,626,341	0	37,233	11,289	1,543,406	7,010	1,598,938
2025	0	37,546	(12,518)	1,571,359	7,010	1,603,397	0	37,296	(12,518)	1,544,206	7,010	1,575,994
2026	0	37,558	24,308	1,571,859	7,010	1,640,735	0	37,308	24,308	1,544,706	7,010	1,613,332
2027	0	37,471	(17,799)	1,572,459	7,010	1,599,141	0	37,221	(17,799)	1,545,306	7,010	1,571,738
2028	0	37,611	(2,291)	1,572,959	7,010	1,629,871	0	37,361	(2,291)	1,545,806	7,010	1,602,468
2029	0	37,538	(9,046)	1,573,659	7,010	1,609,161	0	37,288	(9,046)	1,546,506	7,010	1,581,758
2030	0	37,602	20,756	1,574,259	7,010	1,639,627	0	37,352	20,756	1,547,106	7,010	1,612,224
2031	0	37,474	(97,726)	1,575,159	7,010	1,521,917	0	37,224	(97,726)	1,548,006	7,010	1,494,514
2032	0	37,076	84,999	1,575,959	7,010	1,705,044	0	36,826	84,999	1,548,806	7,010	1,677,641
2033	0	37,281	(94,652)	1,576,759	7,010	1,526,398	0	37,031	(94,652)	1,549,606	7,010	1,498,995
2034	0	36,773	69,593	1,577,559	7,010	1,690,935	0	36,523	69,593	1,550,406	7,010	1,663,532
2035	0	36,113	(242,659)	1,578,359	7,010	1,378,823	0	35,863	(242,659)	1,551,206	7,010	1,351,420

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 5 of 10

Calendar  Year	CALIFORNIA AQUEDUCT (continued)											
	Tehachapi Division						Mojave Division					
	Edmonston Pumping Plant						Alamo Powerplant					
	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recrea- tion	Water Supply					Recrea- tion		
1961	[51] 0	[52] 0	[53] 0	[54] 0	[55] 0	[56] 0	[57] 0	[58] 0	[59] 0	[60] 0	[61] 0	[62] 0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	5,446	8	0	0	0	5,454	0	0	0	0	0	0
1972	100,274	16,067	(6,558)	74,123	6,481	190,387	0	0	0	0	0	0
1973	204,638	34,051	1,329	207,808	1,147	448,973	0	0	0	0	0	0
1974	237,554	18,181	(15,295)	313,634	2,108	556,182	0	0	0	0	0	0
1975	103,352	20,183	(693)	573,219	3,358	699,419	0	0	0	0	0	0
1976	61,122	21,096	(152,171)	685,768	1,581	617,396	0	0	0	0	0	0
1977	0	18,424	(116,219)	236,086	560	138,851	0	0	0	0	0	0
1978	65,027	20,887	121,904	590,329	674	798,821	0	0	0	0	0	0
1979	12,302	46,332	(51,299)	568,338	502	576,175	0	0	0	0	0	0
1980	0	52,967	(134,009)	639,743	1,262	559,963	0	0	0	0	0	0
1981	0	40,602	23,359	938,482	4,112	1,006,555	0	0	0	0	0	0
1982	0	37,244	117,296	812,206	4,045	970,791	0	0	0	0	0	0
1983	0	40,690	(101,155)	431,182	7,291	378,008	0	0	0	0	0	0
1984	0	42,112	(115,214)	556,830	5,244	488,972	0	0	0	0	0	0
1985	0	45,265	139,988	792,477	4,804	982,534	0	0	0	0	0	0
1986	0	36,918	37,546	823,067	3,285	900,816	0	14,735	12,258	429,864	1,508	458,365
1987	0	29,580	(25,522)	851,322	6,937	862,317	0	11,665	(15,270)	417,870	1,239	415,504
1988	0	42,017	(29,747)	1,044,737	4,360	1,061,367	0	21,996	1,101	537,568	971	561,336
1989	0	32,270	(60,826)	1,328,041	7,490	1,306,975	0	4,686	(20,363)	716,360	1,407	702,090
1990	0	42,198	(15,092)	1,579,466	8,879	1,615,451	0	8,998	(5,916)	788,111	1,388	792,481
1991	0	33,999	105,176	441,217	4,560	584,952	0	17,908	34,422	177,308	394	230,032
1992	0	23,121	(92,123)	809,771	1,995	742,764	0	14,873	(17,115)	374,110	423	372,291
1993	0	11,946	(127,738)	759,485	1,676	645,369	0	9,304	(3,455)	308,222	443	314,514
1994	0	40,808	(88,211)	960,815	2,918	916,330	0	21,837	3,395	469,996	430	495,658
1995	0	36,001	(16,431)	542,465	1,669	563,704	0	14,139	(30,761)	384,836	427	368,641
1996	0	37,357	15,438	779,918	2,928	835,641	0	7,247	(11,410)	493,852	565	490,254
1997	0	51,475	40,852	860,798	2,076	955,201	0	20,725	38,960	537,586	507	597,778
1998	0	48,601	(106,487)	607,301	1,585	551,000	0	21,456	31,981	398,385	363	436,565
1999	0	52,726	(2,807)	947,420	3,279	1,000,618	0	26,644	(8,486)	589,756	396	608,310
2000	0	43,072	7,726	1,627,123	4,216	1,682,137	0	8,983	(10,472)	958,997	449	957,957
2001	0	39,544	(18,830)	1,187,300	1,211	1,209,225	0	14,526	3,478	709,985	452	728,441
2002	0	60,037	50,342	1,680,514	3,961	1,794,854	0	15,190	8,398	901,230	490	925,308
2003	0	53,320	(48,181)	1,771,048	10,645	1,786,832	0	13,676	(20,787)	1,035,349	355	1,025,593
2004	0	57,962	3,161	1,970,391	649	2,032,163	0	15,581	17,207	1,120,384	171	1,153,343
2005	0	40,949	(159,678)	1,693,409	559	1,575,239	0	2,561	(50,014)	1,116,158	84	1,068,789
2006	0	52,291	(120,122)	1,898,070	504	1,830,743	0	13,170	8,653	1,281,524	98	1,303,445
2007	0	65,423	118,196	1,836,977	305	2,020,901	0	17,957	(5,091)	1,076,227	103	1,089,196
2008	0	50,959	(4,230)	1,146,056	327	1,193,112	0	14,592	5,383	614,224	80	634,279
2009	0	59,186	(726)	1,125,654	1,295	1,185,409	0	25,599	(5,619)	493,685	1,100	514,765
2010	0	61,816	48,231	1,369,128	603	1,479,778	0	33,660	6,964	956,888	363	997,875
2011	0	64,370	(18,816)	1,631,744	742	1,678,040	0	34,783	(1,405)	1,220,378	500	1,254,256
2012	0	59,192	14,573	1,486,551	938	1,561,254	0	16,371	(229)	892,826	550	909,518
2013	0	(16,957)	26,994	1,099,339	7,010	1,116,386	0	(3,681)	3,925	538,860	1,630	540,734
2014	0	(16,954)	(2,003)	1,507,785	7,010	1,495,838	0	(3,682)	(77)	864,180	1,630	862,051
2015	0	(16,961)	(10)	1,509,660	7,010	1,499,699	0	(3,680)	(82)	866,055	1,630	863,923
2016	0	35,462	(28,401)	1,512,060	7,010	1,526,131	0	20,829	(21,084)	868,455	1,630	869,830
2017	0	35,694	61,309	1,511,555	7,010	1,615,568	0	20,895	33,266	867,950	1,630	923,741
2018	0	35,848	(80,817)	1,519,840	7,010	1,481,881	0	20,998	(50,078)	954,752	1,630	927,302
2019	0	35,672	50,179	1,519,140	7,010	1,612,001	0	20,924	31,508	954,752	1,630	1,008,814
2020	0	35,736	(366)	1,519,440	7,010	1,561,820	0	20,947	(3,398)	954,752	1,630	973,931
2021	0	35,819	10,725	1,520,240	7,010	1,573,794	0	20,946	(1,117)	954,752	1,630	976,211
2022	0	35,813	(3,483)	1,521,140	7,010	1,560,480	0	20,940	(3,434)	954,752	1,630	973,888
2023	0	35,804	(18,971)	1,521,940	7,010	1,545,783	0	20,939	(18,638)	954,752	1,630	958,683
2024	0	35,683	11,289	1,522,840	7,010	1,576,822	0	20,881	21,309	954,752	1,630	998,572
2025	0	35,746	(12,518)	1,523,640	7,010	1,553,878	0	20,965	(11,624)	954,752	1,630	965,723
2026	0	35,758	24,308	1,524,140	7,010	1,591,216	0	20,930	13,030	954,752	1,630	990,342
2027	0	35,671	(17,799)	1,524,740	7,010	1,549,622	0	20,861	(6,161)	954,752	1,630	971,082
2028	0	35,811	12,291	1,525,240	7,010	1,580,352	0	20,961	4,006	954,752	1,630	981,349
2029	0	35,738	(9,046)	1,525,940	7,010	1,559,642	0	20,955	(913)	954,752	1,630	976,424
2030	0	35,802	20,756	1,526,540	7,010	1,590,108	0	20,930	8,528	954,752	1,630	985,840
2031	0	35,674	(97,726)	1,527,440	7,010	1,472,398	0	20,956	(31,057)	954,752	1,630	946,281
2032	0	35,276	84,999	1,528,240	7,010	1,655,325	0	20,865	43,953	954,752	1,630	1,021,200
2033	0	35,481	(94,652)	1,529,040	7,010	1,476,879	0	20,854	(37,929)	954,752	1,630	939,307
2034	0	34,973	69,593	1,529,840	7,010	1,641,416	0	20,769	28,588	954,752	1,630	1,005,739
2035	0	34,313	(242,659)	1,530,640	7,010	1,329,304	0	20,892	(49,219)	954,752	1,630	928,055



**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 6 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	Mojave Division (continued)											
	Pearblossom Pumping Plant						Mojave Siphon Powerplant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
	[63]	[64]	[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	21	0	0	0	0	21	0	0	0	0	0	0
1972	35,243	5,282	(153)	1,794	0	42,166	0	0	0	0	0	0
1973	80,177	21,522	(2,700)	52,201	72	151,272	0	0	0	0	0	0
1974	76,694	10,847	(11,149)	102,839	44	179,275	0	0	0	0	0	0
1975	10,000	2,364	(8,397)	190,351	70	194,388	0	0	0	0	0	0
1976	4,168	7,040	(16,055)	236,713	152	232,018	0	0	0	0	0	0
1977	0	11,398	(17,534)	102,326	580	96,770	0	0	0	0	0	0
1978	19,922	5,696	69,130	374,845	498	470,091	0	0	0	0	0	0
1979	12,302	6,836	(32,518)	362,114	502	349,236	0	0	0	0	0	0
1980	0	16,200	6,159	401,214	781	424,354	0	0	0	0	0	0
1981	0	4,992	(36,278)	574,573	933	544,220	0	0	0	0	0	0
1982	0	5,251	55,232	401,037	1,919	463,439	0	0	0	0	0	0
1983	0	11,745	(26,847)	231,188	1,180	217,266	0	0	0	0	0	0
1984	0	18,228	23,230	252,066	1,494	295,018	0	0	0	0	0	0
1985	0	25,292	(2,815)	350,758	1,076	374,311	0	0	0	0	0	0
1986	0	30,876	12,258	394,156	1,508	438,798	0	0	0	0	0	0
1987	0	27,552	(15,270)	377,531	1,239	391,052	0	0	0	0	0	0
1988	0	32,209	1,101	501,300	971	535,581	0	1,977	1,101	501,291	1,407	505,340
1989	0	31,500	(20,363)	661,189	1,407	673,733	0	29,110	(20,363)	661,100	1,407	671,254
1990	0	32,672	(5,916)	730,560	1,388	758,704	0	23,692	(5,916)	730,550	1,388	749,714
1991	0	15,209	34,774	163,913	394	214,290	0	(543)	34,774	163,913	394	198,538
1992	0	13,989	(17,451)	338,249	423	335,210	0	(13,193)	(17,451)	338,207	423	307,986
1993	0	9,779	(3,455)	255,117	443	261,884	0	(11,922)	(3,455)	255,117	443	240,183
1994	0	150	3,395	409,928	430	413,903	0	1,601	3,395	395,294	430	400,720
1995	0	6,820	(29,282)	328,882	427	306,847	0	10,458	(29,282)	321,387	427	302,990
1996	0	9,514	(11,410)	424,252	565	422,921	0	(5,577)	(11,410)	418,141	565	401,719
1997	0	(1,124)	38,960	461,563	507	499,906	0	5,171	38,960	452,525	507	497,163
1998	0	(2,087)	16,361	334,965	363	349,602	0	11,496	16,361	332,385	363	360,605
1999	0	(1,154)	(8,486)	505,624	396	496,380	0	11,065	(8,486)	498,919	396	501,894
2000	0	(23,296)	(10,472)	864,999	449	831,680	0	4,896	(10,472)	854,980	449	849,853
2001	0	(9,304)	3,478	635,316	452	629,942	0	7,403	3,478	632,420	452	643,753
2002	0	3,810	8,398	823,690	490	836,388	0	9,300	8,398	820,217	490	838,405
2003	0	2,814	(20,787)	962,488	355	944,870	0	(6,586)	(20,787)	941,713	355	914,695
2004	0	(15,558)	17,207	1,047,521	171	1,049,341	0	5,034	17,207	1,035,315	171	1,057,727
2005	0	(18,967)	(50,014)	1,043,564	84	974,667	0	827	(50,014)	1,025,453	84	976,350
2006	0	(21,986)	8,653	1,187,627	98	1,174,392	0	(845)	8,653	1,154,634	98	1,162,540
2007	0	(13,055)	(5,091)	975,802	103	957,759	0	3,060	(5,091)	956,281	103	954,353
2008	0	723	5,383	550,143	80	556,329	0	8,380	5,383	534,480	80	548,323
2009	0	3,807	(5,619)	431,289	1,100	430,577	0	10,520	(5,619)	411,075	1,100	417,076
2010	0	3,489	6,964	886,249	363	897,065	0	11,912	6,964	858,609	363	877,848
2011	0	7,953	(1,405)	1,114,267	500	1,121,315	0	13,506	(1,405)	1,080,445	500	1,093,046
2012	0	3,528	(229)	797,451	550	801,300	0	3,521	(229)	775,488	550	779,330
2013	0	(9,031)	3,925	463,623	1,430	459,947	0	(12,501)	3,925	448,998	1,430	441,852
2014	0	(9,032)	(77)	736,112	1,430	728,433	0	(12,502)	(77)	717,500	1,430	706,351
2015	0	(9,030)	(82)	739,187	1,430	731,505	0	(12,500)	(82)	720,575	1,430	709,423
2016	0	15,479	(21,084)	741,187	1,430	737,012	0	12,009	(21,084)	720,575	1,430	712,930
2017	0	15,545	33,266	736,187	1,430	786,428	0	12,075	33,266	715,575	1,430	762,346
2018	0	15,648	(50,078)	852,454	1,430	819,454	0	12,178	(50,078)	810,872	1,430	774,402
2019	0	15,574	31,508	852,454	1,430	900,966	0	12,104	31,508	810,872	1,430	855,914
2020	0	15,597	(3,398)	854,854	1,430	868,483	0	12,127	(3,398)	810,872	1,430	821,031
2021	0	15,596	(1,117)	854,854	1,430	870,763	0	12,126	(1,117)	810,872	1,430	823,311
2022	0	15,590	(3,434)	854,854	1,430	868,440	0	12,120	(3,434)	810,872	1,430	820,988
2023	0	15,589	(18,638)	854,854	1,430	853,235	0	12,119	(18,638)	810,872	1,430	805,783
2024	0	15,531	21,309	854,854	1,430	893,124	0	12,061	21,309	810,872	1,430	845,672
2025	0	15,615	(11,624)	854,854	1,430	860,275	0	12,145	(11,624)	810,872	1,430	812,823
2026	0	15,580	13,030	854,854	1,430	884,894	0	12,110	13,030	810,872	1,430	837,442
2027	0	15,511	(6,161)	854,854	1,430	865,634	0	12,041	(6,161)	810,872	1,430	818,182
2028	0	15,611	4,006	854,854	1,430	875,901	0	12,141	4,006	810,872	1,430	828,449
2029	0	15,605	(913)	854,854	1,430	870,976	0	12,135	(913)	810,872	1,430	823,524
2030	0	15,580	8,528	854,854	1,430	880,392	0	12,110	8,528	810,872	1,430	832,940
2031	0	15,606	(31,057)	854,854	1,430	840,833	0	12,136	(31,057)	810,872	1,430	793,381
2032	0	15,515	43,953	854,854	1,430	915,752	0	12,045	43,953	810,872	1,430	868,300
2033	0	15,504	(37,929)	854,854	1,430	833,859	0	12,034	(37,929)	810,872	1,430	786,407
2034	0	15,419	28,588	854,854	1,430	900,291	0	11,949	28,588	810,872	1,430	852,839
2035	0	15,542	(49,219)	854,854	1,430	822,607	0	12,072	(49,219)	810,872	1,430	775,155

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 7 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	Santa Ana Division									
	Devil Canyon Powerplant					Greenspot Pumping Plant				
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total
Water Supply				Recreation						
[75]	[76]	[77]	[78]	[79]	[80]	[81]	[82]	[83]	[84]	
1961	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	
1972	37	0	0	1,275	0	1,312	0	0	0	
1973	40,848	14,745	0	51,812	0	107,405	0	0	0	
1974	74,666	8,367	(4,925)	102,198	0	180,306	0	0	0	
1975	10,000	1,995	(6,719)	189,526	0	194,802	0	0	0	
1976	4,168	5,180	(9,182)	235,711	23	235,900	0	0	0	
1977	0	8,082	(5,235)	101,137	469	104,453	0	0	0	
1978	14,820	3,754	21,686	373,636	481	414,377	0	0	0	
1979	12,302	5,620	(27,107)	356,854	485	348,154	0	0	0	
1980	0	9,468	12,714	395,975	742	418,899	0	0	0	
1981	0	8,401	(23,448)	569,088	807	554,848	0	0	0	
1982	0	6,012	44,469	399,799	1,798	452,078	0	0	0	
1983	0	8,597	5,188	230,277	1,078	245,140	0	0	0	
1984	0	12,861	(850)	250,938	1,414	264,363	0	0	0	
1985	0	14,325	(8,791)	349,336	956	355,826	0	0	0	
1986	0	9,486	8,339	392,650	1,378	411,853	0	0	0	
1987	0	7,923	(11,335)	375,451	1,118	373,157	0	0	0	
1988	0	11,090	2,238	499,285	861	513,474	0	0	0	
1989	0	13,116	(5,487)	658,730	1,301	667,660	0	0	0	
1990	0	13,439	(4,622)	728,723	1,281	738,821	0	0	0	
1991	0	10,836	18,308	161,032	340	190,516	0	0	0	
1992	0	9,157	(9,084)	328,354	371	328,798	0	0	0	
1993	0	5,602	5,593	244,678	364	256,237	0	0	0	
1994	0	10,915	(11,045)	393,690	357	393,917	0	0	0	
1995	0	11,268	2,331	320,978	358	334,935	0	0	0	
1996	0	9,496	13,015	417,656	494	440,661	0	0	0	
1997	0	8,087	(19,685)	451,874	416	440,692	0	0	0	
1998	0	6,700	16,643	332,198	310	355,851	0	0	0	
1999	0	9,784	(4,177)	497,787	341	503,735	0	0	0	
2000	0	7,407	(11,040)	853,786	375	850,528	0	0	0	
2001	0	9,324	8,183	631,363	374	649,244	0	0	0	
2002	0	10,315	9,682	818,028	413	838,438	0	0	0	
2003	0	9,198	(18,298)	922,901	260	914,061	0	4,526	4,526	
2004	0	11,166	15,150	1,033,309	85	1,059,710	0	3,798	3,798	
2005	0	4,500	(63,441)	1,010,247	0	951,306	0	3,686	3,686	
2006	0	8,208	7,571	1,153,993	0	1,169,772	0	7,775	7,775	
2007	0	8,216	(5,872)	953,803	0	956,147	0	12,168	12,168	
2008	0	10,599	7,759	533,221	0	551,579	0	14,408	14,408	
2009	0	10,035	(5,600)	410,032	1,025	415,492	0	20,542	20,542	
2010	0	6,275	5,344	851,786	307	863,712	0	18,395	18,395	
2011	0	7,359	2,371	1,066,088	417	1,076,235	0	20,586	20,586	
2012	0	(1,913)	(2,225)	772,011	459	768,332	0	23,791	23,791	
2013	0	(8,254)	(75)	447,520	1,250	440,441	0	11,036	11,036	
2014	0	(8,254)	(77)	711,995	1,250	704,914	0	10,380	10,380	
2015	0	(8,252)	(82)	711,995	1,250	704,911	0	10,380	10,380	
2016	0	8,483	(1,269)	711,995	1,250	720,459	0	10,380	10,380	
2017	0	8,502	9,828	711,995	1,250	731,575	0	10,380	10,380	
2018	0	8,484	(19,777)	798,132	1,250	788,089	0	10,380	10,380	
2019	0	8,492	17,408	798,132	1,250	825,282	0	10,380	10,380	
2020	0	8,483	(17,305)	798,132	1,250	790,560	0	10,380	10,380	
2021	0	8,486	(398)	798,132	1,250	807,470	0	10,380	10,380	
2022	0	8,486	13,735	798,132	1,250	821,603	0	10,380	10,380	
2023	0	8,482	(8,417)	798,132	1,250	799,447	0	10,380	10,380	
2024	0	8,462	689	798,132	1,250	808,533	0	10,380	10,380	
2025	0	8,489	4,591	798,132	1,250	812,462	0	10,380	10,380	
2026	0	8,475	(3,819)	798,132	1,250	804,038	0	10,380	10,380	
2027	0	8,479	745	798,132	1,250	808,606	0	10,380	10,380	
2028	0	8,481	(5,355)	798,132	1,250	802,508	0	10,380	10,380	
2029	0	8,481	2,909	798,132	1,250	810,772	0	10,380	10,380	
2030	0	8,480	296	798,132	1,250	808,158	0	10,380	10,380	
2031	0	8,475	(1,976)	798,132	1,250	805,881	0	10,380	10,380	
2032	0	8,449	18,821	798,132	1,250	826,652	0	10,380	10,380	
2033	0	8,449	(23,419)	798,132	1,250	784,412	0	10,380	10,380	
2034	0	8,443	21,651	798,132	1,250	829,476	0	10,380	10,380	
2035	0	8,451	(31,434)	798,132	1,250	776,399	0	10,380	10,380	

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 8 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)														
	Santa Ana Division (continued)								West Branch, California Aqueduct						
	Crafter Hills Pumping Plant				Cherry Valley Pumping Plant				Oso Pumping Plant						
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	
[85]	[86]	[87]	[88]	[89]	[90]	[91]	[92]	[93]	[94]	[95]	[96]	[97]	[98]		
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	2,444	133	0	0	0	2,577	
1972	0	0	0	0	0	0	0	0	63,883	6,557	(6,405)	71,991	6,481	142,507	
1973	0	0	0	0	0	0	0	0	124,461	16,995	4,029	155,317	1,075	301,877	
1974	0	0	0	0	0	0	0	0	160,860	12,702	(4,146)	209,172	2,064	380,652	
1975	0	0	0	0	0	0	0	0	93,352	23,008	7,704	374,306	3,288	501,658	
1976	0	0	0	0	0	0	0	0	56,954	15,845	(136,116)	420,708	1,429	358,820	
1977	0	0	0	0	0	0	0	0	0	4,407	(98,685)	122,447	(20)	28,149	
1978	0	0	0	0	0	0	0	0	45,105	9,061	52,774	171,139	176	278,255	
1979	0	0	0	0	0	0	0	0	0	25,355	(18,781)	145,598	0	152,172	
1980	0	0	0	0	0	0	0	0	0	24,576	(140,168)	165,931	481	50,820	
1981	0	0	0	0	0	0	0	0	0	15,254	59,637	283,264	3,179	361,334	
1982	0	0	0	0	0	0	0	0	0	23,824	61,685	360,878	2,126	448,513	
1983	0	0	0	0	0	0	0	0	0	23,601	(74,308)	166,995	6,111	122,399	
1984	0	0	0	0	0	0	0	0	0	12,461	(138,146)	272,101	3,750	150,166	
1985	0	0	0	0	0	0	0	0	0	28,257	142,219	403,097	3,728	577,301	
1986	0	0	0	0	0	0	0	0	0	22,387	25,288	393,203	1,777	442,655	
1987	0	0	0	0	0	0	0	0	0	18,164	(10,252)	433,452	5,698	447,062	
1988	0	0	0	0	0	0	0	0	0	20,461	(30,848)	507,169	3,389	500,171	
1989	0	0	0	0	0	0	0	0	0	27,914	(40,463)	611,681	6,083	605,215	
1990	0	0	0	0	0	0	0	0	0	33,666	(9,176)	791,355	7,491	823,336	
1991	0	0	0	0	0	0	0	0	0	16,460	70,754	263,909	4,166	355,289	
1992	0	0	0	0	0	0	0	0	0	8,238	(75,008)	435,661	1,572	370,463	
1993	0	0	0	0	0	0	0	0	0	2,674	(124,283)	451,263	1,233	330,887	
1994	0	0	0	0	0	0	0	0	0	18,688	(91,606)	490,819	2,488	420,389	
1995	0	0	0	0	0	0	0	0	0	21,775	14,330	157,629	1,242	194,976	
1996	0	0	0	0	0	0	0	0	0	30,121	26,848	286,066	2,363	345,398	
1997	0	0	0	0	0	0	0	0	0	30,468	1,892	323,212	1,569	357,141	
1998	0	0	0	0	0	0	0	0	0	26,851	(122,848)	208,916	1,222	114,141	
1999	0	0	0	0	0	0	0	0	0	25,690	5,679	357,664	2,883	391,916	
2000	0	0	0	0	0	0	0	0	0	33,658	18,198	668,126	3,767	723,749	
2001	0	0	0	0	0	0	0	0	0	24,551	(22,308)	477,315	759	480,317	
2002	0	0	0	0	0	0	0	0	0	44,692	41,944	779,284	3,471	869,391	
2003	0	0	2,733	2,733	0	0	0	116	0	39,495	(27,394)	735,699	10,290	758,090	
2004	0	0	3,212	3,212	0	0	0	841	0	41,947	(14,046)	850,007	478	878,386	
2005	0	0	2,727	2,727	0	0	0	692	0	38,154	(109,664)	577,251	475	506,216	
2006	0	0	6,892	6,892	0	0	0	807	0	38,534	(128,775)	616,546	406	526,711	
2007	0	0	9,038	9,038	0	0	0	177	0	46,921	123,287	760,750	202	931,160	
2008	0	0	13,728	13,728	0	0	0	1,042	0	36,204	(9,613)	531,832	247	558,670	
2009	0	0	16,463	16,463	0	0	0	1,898	0	33,295	4,893	631,969	195	670,352	
2010	0	0	17,778	17,778	0	0	0	5,685	0	27,788	41,267	412,240	240	481,535	
2011	0	0	19,887	19,887	0	0	0	9,290	0	29,227	(17,411)	411,366	242	423,424	
2012	0	0	20,614	20,614	0	0	0	11,010	0	42,657	14,802	593,725	388	651,572	
2013	0	0	10,824	10,824	0	0	0	9,008	0	(13,326)	23,069	560,475	5,380	575,598	
2014	0	0	10,380	10,380	0	0	0	6,285	0	(13,322)	(1,926)	643,605	5,380	633,737	
2015	0	0	10,380	10,380	0	0	0	9,905	0	(13,331)	72	643,605	5,380	635,726	
2016	0	0	10,380	10,380	0	0	0	9,925	0	14,583	(7,317)	643,605	5,380	656,251	
2017	0	0	10,380	10,380	0	0	0	9,945	0	14,749	28,043	643,605	5,380	691,777	
2018	0	0	10,380	10,380	0	0	0	9,520	0	14,800	(30,739)	565,088	5,380	554,529	
2019	0	0	10,380	10,380	0	0	0	9,700	0	14,698	18,671	564,388	5,380	603,137	
2020	0	0	10,380	10,380	0	0	0	9,700	0	14,739	3,032	564,688	5,380	587,839	
2021	0	0	10,380	10,380	0	0	0	9,700	0	14,823	11,842	565,488	5,380	597,533	
2022	0	0	10,380	10,380	0	0	0	9,700	0	14,823	(49)	566,388	5,380	586,542	
2023	0	0	10,380	10,380	0	0	0	9,700	0	14,815	(333)	567,188	5,380	587,500	
2024	0	0	10,380	10,380	0	0	0	9,700	0	14,752	(10,020)	568,088	5,380	578,200	
2025	0	0	10,380	10,380	0	0	0	9,700	0	14,731	(894)	568,888	5,380	588,105	
2026	0	0	10,380	10,380	0	0	0	9,700	0	14,778	11,278	569,388	5,380	600,824	
2027	0	0	10,380	10,380	0	0	0	9,700	0	14,760	(11,638)	569,988	5,380	578,490	
2028	0	0	10,380	10,380	0	0	0	9,700	0	14,800	8,285	570,488	5,380	598,953	
2029	0	0	10,380	10,380	0	0	0	9,700	0	14,733	(8,133)	571,188	5,380	583,168	
2030	0	0	10,380	10,380	0	0	0	9,700	0	14,822	12,228	571,788	5,380	604,218	
2031	0	0	10,380	10,380	0	0	0	9,700	0	14,668	(66,669)	572,688	5,380	526,067	
2032	0	0	10,380	10,380	0	0	0	9,700	0	14,361	41,046	573,488	5,380	634,275	
2033	0	0	10,380	10,380	0	0	0	9,700	0	14,577	(56,723)	574,288	5,380	537,522	
2034	0	0	10,380	10,380	0	0	0	9,700	0	14,154	41,005	575,088	5,380	635,627	
2035	0	0	10,380	10,380	0	0	0	9,700	0	13,371	(193,440)	575,888	5,380	401,199	

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 9 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	West Branch, California Aqueduct (continued)											
	Warne Powerplant						Castaic Powerplant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[99]	[100]	[101]	[102]	[103]	[104]	[105]	[106]	[107]	[108]	[109]	[110]	
1961	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	0	0	
1972	0	0	0	0	0	57,364	1,788	(6,162)	71,938	6,481	131,409	
1973	0	0	0	0	0	37,198	6,430	4,542	155,297	1,075	204,542	
1974	0	0	0	0	0	82,364	1,772	(950)	209,136	541	292,863	
1975	0	0	0	0	0	90,460	5,002	(1,534)	374,280	1,563	469,771	
1976	0	0	0	0	0	55,990	(7,695)	(132,036)	420,684	1,429	338,372	
1977	0	0	0	0	0	0	(1,485)	(102,532)	122,447	(20)	18,410	
1978	0	0	0	0	0	45,105	(2,264)	129,523	171,139	176	343,679	
1979	0	0	0	0	0	0	(2,339)	(20,400)	145,598	0	122,859	
1980	0	0	0	0	0	0	991	(118,026)	165,931	481	49,377	
1981	0	0	0	0	0	0	(44,416)	47,244	283,264	2,704	288,796	
1982	0	24,468	61,169	360,878	2,126	448,641	(60,135)	59,069	360,878	1,187	360,999	
1983	0	20,780	(74,308)	166,995	6,111	119,578	(33,418)	(46,904)	166,995	2,618	89,291	
1984	0	13,572	(139,219)	275,212	2,208	151,773	(29,618)	(139,545)	275,212	2,201	108,250	
1985	0	29,286	141,492	403,097	874	574,749	(4,622)	135,007	403,097	844	534,326	
1986	0	21,579	25,288	393,203	1,777	441,847	(6,664)	21,520	393,203	623	408,682	
1987	0	20,885	(10,252)	433,452	5,698	449,783	(519)	(6,241)	433,452	2,734	429,426	
1988	0	23,253	(31,453)	507,169	3,389	502,358	12,650	(28,498)	507,169	1,359	492,680	
1989	0	27,131	(40,463)	611,681	6,083	604,432	0	634	(40,154)	611,681	3,161	575,322
1990	0	34,208	(9,176)	791,355	7,491	823,878	(14,012)	(15,101)	786,519	3,419	760,825	
1991	0	16,908	70,754	263,909	4,166	355,737	(871)	89,637	262,921	2,283	353,970	
1992	0	9,638	(75,008)	435,661	1,572	371,863	(609)	(71,795)	435,661	1,543	364,800	
1993	0	1,922	(124,283)	451,257	1,233	330,129	21,959	(77,428)	451,257	1,211	396,999	
1994	0	23,151	(91,606)	490,819	2,488	424,852	0	5,205	(95,738)	490,819	2,465	402,751
1995	0	15,860	14,330	157,629	1,242	189,061	0	20,400	75,863	157,629	1,223	255,115
1996	0	21,191	26,848	286,066	2,363	336,468	(5,621)	19,088	286,066	2,362	301,895	
1997	0	23,437	1,892	323,201	1,569	350,099	0	11,119	(1,802)	323,201	1,566	334,084
1998	0	26,864	(122,848)	208,909	1,222	114,147	0	24,544	(57,726)	208,909	1,222	176,949
1999	0	21,822	8,120	357,664	2,883	390,489	0	(3,670)	6,280	357,664	2,865	363,139
2000	0	27,237	18,198	668,126	3,767	717,328	0	(19,645)	9,320	665,926	1,556	657,157
2001	0	17,404	(22,308)	477,315	759	473,170	0	(5,949)	(16,588)	477,315	746	455,524
2002	0	35,058	41,944	779,284	3,471	859,757	0	10,071	35,623	776,136	305	822,135
2003	0	28,167	(27,394)	735,699	10,290	746,762	0	9,075	(17,034)	725,781	356	718,178
2004	0	31,034	(14,046)	850,007	478	867,473	0	9,120	(11,440)	845,960	456	844,096
2005	0	29,111	(109,664)	577,251	475	497,173	0	21,155	(61,490)	577,251	472	537,388
2006	0	23,453	(128,775)	616,546	406	511,630	0	4,173	(121,607)	616,546	396	499,508
2007	0	29,978	123,287	760,750	202	914,217	0	(1,664)	117,880	758,860	196	875,272
2008	0	36,744	(9,613)	531,832	247	559,210	0	498	(14,279)	529,852	211	516,282
2009	0	30,564	4,893	631,969	195	667,621	0	(2,825)	9,194	628,819	164	635,352
2010	0	26,930	41,267	412,240	240	480,677	0	(4,135)	40,284	409,090	207	445,446
2011	0	29,363	(17,411)	411,366	242	423,560	0	(9,084)	(22,531)	408,846	221	377,452
2012	0	28,769	14,802	593,701	388	637,660	0	7,535	16,335	590,551	375	614,796
2013	0	(15,236)	23,069	560,471	5,380	573,684	0	(9,690)	25,069	559,888	2,330	577,597
2014	0	(15,232)	(1,926)	643,605	5,380	631,827	0	(9,687)	(1,926)	641,715	2,330	632,432
2015	0	(15,241)	72	643,605	5,380	633,816	0	(9,696)	72	641,715	2,330	634,421
2016	0	12,673	(7,317)	643,605	5,380	654,341	0	6,388	(7,317)	641,715	2,330	643,116
2017	0	12,839	28,043	643,605	5,380	689,867	0	6,554	28,043	641,715	2,330	678,642
2018	0	12,890	(30,739)	565,088	5,380	552,619	0	6,605	(30,739)	563,198	2,330	541,394
2019	0	12,788	18,671	564,388	5,380	601,227	0	6,503	18,671	562,998	2,330	590,002
2020	0	12,829	3,032	564,688	5,380	585,929	0	6,544	3,032	562,798	2,330	574,704
2021	0	12,913	11,842	565,488	5,380	595,623	0	6,628	11,842	563,598	2,330	584,398
2022	0	12,913	(49)	566,388	5,380	584,632	0	6,628	(49)	564,498	2,330	573,407
2023	0	12,905	(333)	567,188	5,380	585,140	0	6,620	(333)	565,298	2,330	573,915
2024	0	12,842	(10,020)	568,088	5,380	576,290	0	6,557	(10,020)	566,198	2,330	565,065
2025	0	12,821	(894)	568,888	5,380	586,195	0	6,536	(894)	566,998	2,330	574,970
2026	0	12,868	11,278	569,388	5,380	598,914	0	6,583	11,278	567,498	2,330	587,689
2027	0	12,850	(11,638)	569,988	5,380	576,580	0	6,565	(11,638)	568,098	2,330	565,355
2028	0	12,890	8,285	570,488	5,380	597,043	0	6,605	8,285	568,598	2,330	585,818
2029	0	12,823	(8,133)	571,188	5,380	581,258	0	6,538	(8,133)	569,298	2,330	570,033
2030	0	12,912	12,228	571,788	5,380	602,308	0	6,627	12,228	569,898	2,330	591,083
2031	0	12,758	(66,669)	572,688	5,380	524,157	0	6,473	(66,669)	570,798	2,330	512,932
2032	0	12,451	41,046	573,488	5,380	632,365	0	6,166	41,046	571,598	2,330	621,140
2033	0	12,667	(56,723)	574,288	5,380	535,612	0	6,382	(56,723)	572,398	2,330	524,387
2034	0	12,244	41,005	575,088	5,380	633,717	0	5,959	41,005	573,198	2,330	622,492
2035	0	11,461	(193,440)	575,888	5,380	399,289	0	5,176	(193,440)	573,998	2,330	388,064

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 10 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Coastal Branch, California Aqueduct							
	Las Perillas and Badger Hill Pumping Plants				Devil's Den, Bluestone, and Polonio Pass Pumping Plants			
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total
[111]	[112]	[113]	[114]	[115]	[116]	[117]	[118]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	210	873	79,039	80,122	0	0	0	0
1969	0	1,042	62,064	63,106	0	0	0	0
1970	0	638	83,649	84,287	0	0	0	0
1971	0	3,455	110,971	114,426	0	0	0	0
1972	0	1,745	121,755	123,500	0	0	0	0
1973	0	5,479	78,645	84,124	0	0	0	0
1974	0	7,344	78,174	85,518	0	0	0	0
1975	0	5,819	85,216	91,035	0	0	0	0
1976	0	6,562	90,058	96,620	0	0	0	0
1977	0	5,777	40,579	46,356	0	0	0	0
1978	0	9,085	92,604	101,689	0	0	0	0
1979	0	10,896	123,155	134,051	0	0	0	0
1980	0	9,449	111,379	120,828	0	0	0	0
1981	0	13,232	109,754	122,986	0	0	0	0
1982	0	7,984	95,776	103,760	0	0	0	0
1983	0	5,710	100,518	106,228	0	0	0	0
1984	0	5,740	126,387	132,127	0	0	0	0
1985	0	7,563	120,823	128,386	0	0	0	0
1986	0	8,719	131,599	140,318	0	0	0	0
1987	0	11,363	128,080	139,443	0	0	0	0
1988	0	12,831	120,969	133,800	0	0	0	0
1989	0	11,454	116,801	128,255	0	0	0	0
1990	0	13,022	109,802	122,824	0	0	0	0
1991	0	5,802	1,496	7,298	0	0	0	0
1992	0	7,893	79,635	87,528	0	0	0	0
1993	0	9,282	94,921	104,203	0	0	0	0
1994	0	8,515	87,158	95,673	0	0	0	0
1995	0	6,986	94,536	101,522	0	0	0	0
1996	0	9,663	114,630	124,293	0	0	0	0
1997	527	8,343	110,428	119,298	527	0	8,538	9,065
1998	0	8,415	109,400	117,815	0	0	22,210	22,210
1999	0	2,453	120,061	122,514	0	303	23,880	24,183
2000	0	(429)	120,313	119,884	0	0	26,703	26,703
2001	0	(742)	87,915	87,173	0	0	23,229	23,229
2002	0	638	99,783	100,421	0	(151)	31,991	31,840
2003	0	161	101,113	101,274	0	284	31,421	31,705
2004	0	492	104,144	104,636	0	480	33,870	34,350
2005	0	1,484	103,178	104,662	0	573	27,595	28,168
2006	0	1,994	115,433	117,427	0	2,034	27,484	29,518
2007	0	3,355	131,590	134,945	0	293	31,516	31,809
2008	0	3,696	107,239	110,935	0	(30)	21,795	21,765
2009	0	2,242	102,509	104,751	0	(3,078)	19,253	16,175
2010	0	4,050	106,590	110,640	0	272	21,532	21,804
2011	0	3,994	114,089	118,083	0	533	24,869	25,402
2012	0	6,745	110,183	116,928	0	589	23,418	24,007
2013	0	802	77,744	78,546	0	212	27,873	28,085
2014	0	802	93,565	94,367	0	212	32,122	32,334
2015	0	802	93,565	94,367	0	212	32,122	32,334
2016	0	802	93,565	94,367	0	212	32,122	32,334
2017	0	802	93,565	94,367	0	212	32,122	32,334
2018	0	802	99,108	99,910	0	212	39,665	39,877
2019	0	802	99,108	99,910	0	212	39,665	39,877
2020	0	802	99,108	99,910	0	212	39,665	39,877
2021	0	802	99,108	99,910	0	212	39,665	39,877
2022	0	802	99,108	99,910	0	212	39,665	39,877
2023	0	802	99,108	99,910	0	212	39,665	39,877
2024	0	802	99,108	99,910	0	212	39,665	39,877
2025	0	802	99,108	99,910	0	212	39,665	39,877
2026	0	802	99,108	99,910	0	212	39,665	39,877
2027	0	802	99,108	99,910	0	212	39,665	39,877
2028	0	802	99,108	99,910	0	212	39,665	39,877
2029	0	802	99,108	99,910	0	212	39,665	39,877
2030	0	802	99,108	99,910	0	212	39,665	39,877
2031	0	802	99,108	99,910	0	212	39,665	39,877
2032	0	802	99,108	99,910	0	212	39,665	39,877
2033	0	802	99,108	99,910	0	212	39,665	39,877
2034	0	802	99,108	99,910	0	212	39,665	39,877
2035	0	802	99,108	99,910	0	212	39,665	39,877



**TABLE B-7 Reconciliation of Capital Costs Allocated to Water Supply and Power Generation** (Thousands of Dollars)

Item	Project Costs Allocated to Water Supply and Power Generation							Capital Costs Allocated to Other Purposes	Total SWP Capital Cost
	Miscellaneous Income Credited to Construction <sup>a</sup>	Allowance for Future Price Escalation <sup>b</sup>	Costs of Construction of Delivery Structures <sup>c</sup>	Costs of Requested Excess Capacity and Future Enlargement <sup>d</sup>	Capital Cost Component of Delta Water Charge <sup>e</sup>	Capital Cost Component of Transportation Water Charge <sup>f</sup>	Water Supply and Power Total		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
<b>CONSERVATION FACILITIES</b>									
Upper Feather Division									
Frenchman Dam & Lake	180	0	0	0	601,50928	0	782	2,876	3,658
Grizzly Valley Dam & Lake Davis	65	0	0	0	54,24955	0	119	8,872	8,991
Antelope Dam & Lake	1	0	0	0	0	0	1	5,863	5,864
Abbey Bridge Dam & Reservoir	0	0	0	0	0	0	0	520	520
Dixie Refuge Dam & Reservoir	0	0	0	0	0	0	0	236	236
<b>Total, Upper Feather Division</b>	<b>246</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>656</b>	<b>0</b>	<b>902</b>	<b>18,368</b>	<b>19,270</b>
Oroville Division									
Multipurpose Facilities	86,316	0	0	0	441,163	0	527,478	98,409	625,887
Specific Power Facilities	230	0	0	0	108,994	0	109,224	(958)	108,266
<b>Total, Oroville Division</b>	<b>86,546</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>550,156</b>	<b>0</b>	<b>636,702</b>	<b>97,450</b>	<b>734,152</b>
California Aqueduct									
North San Joaquin Division	1,210	0	0	0	82,457	0	83,667	3,316	86,983
San Luis Division	13,152	0	0	0	105,907	0	119,059	4,540	123,599
<b>Total, California Aqueduct</b>	<b>14,362</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>188,364</b>	<b>0</b>	<b>202,726</b>	<b>7,856</b>	<b>210,582</b>
Delta Facilities	37,311	0	0	0	344,050	0	381,361	16,965	398,327
Planning and Pre-Operation	5,302	0	0	0	57,086	0	62,388	0	62,388
<b>TOTAL, CONSERVATION FACILITIES</b>	<b>143,766</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,140,312</b>	<b>0</b>	<b>1,284,079</b>	<b>140,640</b>	<b>1,424,718</b>
<b>TRANSPORTATION FACILITIES</b>									
Upper Feather Division									
Grizzly Valley Pipeline	(1)	0	317	0	0	341	656	0	656
North Bay Aqueduct	406,302	0	676	0	0	110,067	517,045	0	517,045
South Bay Aqueduct	190,362	0	3,603	0	0	162,060	356,025	23,555	379,580
California Aqueduct									
North San Joaquin Division	10,835	0	108	0	0	202,616	213,559	7,380	220,939
San Luis Division	17,460	0	0	0	0	141,183	158,643	8,814	167,458
South San Joaquin Division	14,976	0	4,707	2,093	0	297,193	318,968	17,783	336,751
Tehachapi Division	4,525	0	0	5,230	0	347,161	356,917	20,932	377,849
Mojave Division	(1,799)	0	1,693	0	0	327,254	327,148	40,313	367,461
Santa Ana Division	(9,964)	0	6,101	5,331	0	406,292	407,761	42,954	450,715
West Branch	40,088	0	461	37	0	489,831	530,417	32,598	563,015
Coastal Branch	(66)	0	181	0	0	498,528	498,643	0	498,643
<b>Total, California Aqueduct</b>	<b>76,056</b>	<b>0</b>	<b>13,251</b>	<b>12,691</b>	<b>0</b>	<b>2,710,059</b>	<b>2,812,057</b>	<b>170,774</b>	<b>2,982,831</b>
<b>TOTAL, TRANSPORTATION FACILITIES</b>	<b>672,718</b>	<b>0</b>	<b>17,846</b>	<b>12,691</b>	<b>0</b>	<b>2,982,527</b>	<b>3,685,783</b>	<b>194,329</b>	<b>3,880,112</b>
East Branch Enlargement	0	0	0	0	0	462,125	462,125	0	462,125
East Branch Extension	0	0	0	0	0	369,971	369,971	0	369,971
Coastal Power Allocation	0	0	0	0	0	30,708	30,708	0	30,708
Agricultural Drainage Facilities	0	0	0	0	0	0	0	99,052	99,052
Off-Aqueduct Power Generation Facilities	0	0	0	0	0	491,573	491,573	0	491,573
Small Hydro Power Generation Facilities	0	0	0	0	14,095	85,703	99,798	0	99,798
Land Purchase - Kern Water Bank	0	0	0	0	34,686	0	34,686	0	34,686
Unassigned / Miscellaneous	0	0	0	0	0	0	0	146,251	146,251
Davis-Grunsky	0	0	0	0	0	0	0	130,000	130,000
<b>TOTAL THROUGH 2022</b>	<b>816,485</b>	<b>0</b>	<b>17,846</b>	<b>12,691</b>	<b>1,189,093</b>	<b>4,422,608</b>	<b>6,458,724</b>	<b>710,271</b>	<b>7,168,995</b>

<sup>a</sup> Miscellaneous project receipts that are applied for accounting purposes to reduce the capital costs of the particular facilities.

<sup>b</sup> These allowances are included for planning the future financial program, but not for determining current water charges.

<sup>c</sup> See Table B-8.

<sup>d</sup> See Table B-9.

<sup>e</sup> See Table B-13.

<sup>f</sup> See Table B-10. Mojave Division total reduced by \$85,703,000 for costs included in "Small Hydro Power Generation Facilities" line.

**TABLE B-8 SWP Capital Costs of Requested Delivery Structures**

Project Service Area and Water Supply Contractors	(in dollars)						Total
	1952-2010	2011	2012	2013	2014	2015	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
<b>FEATHER RIVER AREA</b>							
County of Butte	258,915	3,064	0	2,000	0	0	263,979
Plumas County Flood Control and Water Conservation District	8,723	0	0	0	0	0	8,723
Thermalito Irrigation District (b)	43,939	0	0	0	0	0	43,939
<b>Subtotal</b>	<b>311,577</b>	<b>3,064</b>	<b>0</b>	<b>2,000</b>	<b>0</b>	<b>0</b>	<b>316,641</b>
<b>NORTH BAY AREA</b>							
Napa County Flood Control and Water Conservation District	13,590	0	0	0	0	0	13,590
Solano County Water Agency	662,113	0	0	0	0	0	662,113
<b>Subtotal</b>	<b>675,703</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>675,703</b>
<b>SOUTH BAY AREA</b>							
Alameda County Flood Control and Water Conservation District, Zone 7 (d)	415,483	1,112,422	354,768	2,000	0	0	1,884,673
Alameda County Water District (d)	239,579	373,997	17,000	0	0	0	630,576
Santa Clara Valley Water District	21,500	0	0	0	0	0	21,500
San Francisco Water Department (b)	1,066,680	0	0	0	0	0	1,066,680
<b>Subtotal</b>	<b>1,743,242</b>	<b>1,486,419</b>	<b>371,768</b>	<b>2,000</b>	<b>0</b>	<b>0</b>	<b>3,603,429</b>
<b>CENTRAL COASTAL AREA</b>							
San Luis Obispo County Flood Control and Water Conservation District	26,204	0	0	5,000	0	0	31,204
Santa Barbara County Flood Control and Water Conservation District	67,058	0	0	0	0	0	67,058
<b>Subtotal</b>	<b>93,262</b>	<b>0</b>	<b>0</b>	<b>5,000</b>	<b>0</b>	<b>0</b>	<b>98,262</b>
<b>SAN JOAQUIN VALLEY AREA</b>							
Castaic Lake Water Agency	82,567	0	0	0	0	0	82,567
County of Kings	17,206	0	4	30,000	10,000	0	57,210
Dudley Ridge Water District	304,541	0	0	0	0	0	304,541
Empire West Side Irrigation District	6,358	0	0	0	0	0	6,358
Green Valley Water District (c )	5,292	0	0	0	0	0	5,292
Kern County Water Agency	3,284,710	160,734	415,782	150,000	50,000	0	4,061,226
Oak Flat Water District	97,643	0	0	0	0	0	97,643
Tracy Golf and Country Club (c )	6,932	0	0	0	0	0	6,932
Tulare Lake Basin Water Storage District	277,483	0	0	0	0	0	277,483
Veterans Administration Cemetery (b)	3,342	0	0	0	0	0	3,342
<b>Subtotal</b>	<b>4,086,074</b>	<b>160,734</b>	<b>415,787</b>	<b>180,000</b>	<b>60,000</b>	<b>0</b>	<b>4,902,595</b>
<b>SOUTHERN CALIFORNIA AREA</b>							
Antelope Valley-East Kern Water Agency	638,130	298,649	101,418	175,000	50,000	0	1,263,197
Castaic Lake Water Agency	375,593	0	0	0	0	0	375,593
Coachella Valley Water District	14,206	0	0	0	0	0	14,206
Crestline-Lake Arrowhead Water Agency	25,298	0	0	0	0	0	25,298
Desert Water Agency	23,438	0	0	0	0	0	23,438
Littlerock Creek Irrigation District	23,732	0	0	0	0	0	23,732
Mojave Water Agency	238,893	56,722	13,415	0	0	0	309,030
Palmdale Water District	34,173	0	0	0	0	0	34,173
San Bernardino Valley Municipal Water District	960,685	0	0	0	0	0	960,685
San Gabriel Valley Municipal Water District	131,052	0	0	0	0	0	131,052
San Geronio Pass Water Agency	116,740	1,818	0	15,000	50,000	0	183,558
The Metropolitan Water District of Southern California	4,814,078	0	2,012	10,000	0	0	4,826,090
Ventura County Flood Control District	79,699	0	0	0	0	0	79,699
<b>Subtotal</b>	<b>7,475,717</b>	<b>357,189</b>	<b>116,845</b>	<b>200,000</b>	<b>100,000</b>	<b>0</b>	<b>8,249,751</b>
<b>TOTAL</b>	<b>14,385,575</b>	<b>2,007,406</b>	<b>904,399</b>	<b>389,000</b>	<b>160,000</b>	<b>0</b>	<b>17,846,380</b>

- (a) Approximate only, not to be construed as invoice amounts.
- (b) Not a SWP water supply contractor.
- (c) Not a SWP water supply contractor, but has contracted for water.
- (d) South Bay Aqueduct Enlargement and Improvement actual costs for 2011 and 2012.

**TABLE B-9 Capital Costs of Requested Excess Peaking Capacity**

(in dollars unless otherwise indicated)

Sheet 1 of 2

Calendar Year	Total Advance Payments and Credits for Excess Capacity	Total Incremental Costs for Excess Capacity	Over payment (+) or Under payment (-) (a)	Annual Surplus Money Investment Fund Interest Rate (b)		Net Over or Underpayment With Interest (c)
				Jan-Jun	Jul-Dec	
	[1]	[2]	[3]	[4]	[5]	[6]
<b>THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA</b>						
1965	0	158,000	(158,000)	3.968%	4.184%	(163,412)
1966	8,056,000	435,800	7,620,200	4.540%	5.057%	7,701,103
1967	9,094,963	1,878,270	7,216,693	4.815%	4.744%	15,524,533
1968	1,523,252	2,887,351	(1,364,099)	5.330%	5.540%	14,959,187
1969	8,310,651	3,059,310	5,251,341	5.946%	6.389%	21,369,973
1970	3,426,736	2,397,102	1,029,634	7.071%	7.125%	23,986,083
1971	1,086,045	1,146,648	(60,603)	5.154%	5.580%	25,238,017
1972	(4,244,807)	487,394	(4,732,201)	4.477%	4.977%	21,532,965
1973	(15,913,829)	25,041	(15,938,870)	6.023%	8.717%	6,014,116
1974	0	37,775	(37,775)	9.222%	10.351%	6,576,393
1975	0	2,085	(2,085)	7.089%	6.791%	7,038,515
1976	0	0	0	6.048%	6.021%	7,469,662
1977	0	0	0	5.788%	6.182%	7,923,403
1978	0	0	0	7.171%	8.096%	8,539,736
1979	0	0	0	8.979%	9.671%	9,354,605
1980	0	0	0	11.500%	11.500%	10,461,314
<b>Total</b>	<b>11,339,011</b>	<b>12,514,776</b>	<b>(1,175,765)</b>	<b>-</b>	<b>-</b>	<b>10,461,314</b>
<b>SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT</b>						
1967	0	25,730	(25,730)	4.815%	4.744%	(26,611)
1968	184,422	44,053	140,369	5.330%	5.540%	117,587
1969	49,052	38,075	10,977	5.946%	6.389%	136,751
1970	44,911	17,959	26,952	7.071%	7.125%	175,186
1971	61,588	5,900	55,688	5.154%	5.580%	242,927
1972	(20,263)	6,835	(27,098)	4.477%	4.977%	226,230
1973	(180,465)	0	(180,465)	6.023%	8.717%	49,198
1974	0	0	0	9.222%	10.351%	54,130
1975	0	0	0	7.089%	6.791%	57,952
1976	0	0	0	6.048%	6.021%	61,501
1977	0	0	0	5.788%	6.182%	65,237
1978	0	0	0	7.171%	8.096%	70,312
1979	0	0	0	8.979%	9.671%	77,021
1980	0	0	0	11.500%	11.500%	86,133
<b>Total</b>	<b>139,245</b>	<b>138,552</b>	<b>693</b>	<b>-</b>	<b>-</b>	<b>86,133</b>
<b>ANTELOPE VALLEY-EAST KERN WATER AGENCY</b>						
1968	85,495	1,645	83,850	5.330%	5.540%	86,962
1969	52,625	6,326	46,299	5.946%	6.389%	140,964
1970	101,648	15,076	86,572	7.071%	7.125%	243,222
1971	34,062	11,748	22,314	5.154%	5.580%	279,673
1972	(12,794)	2,018	(14,812)	4.477%	4.977%	277,552
1973	(205,354)	308	(205,662)	6.023%	8.717%	77,288
1974	0	96	(96)	9.222%	10.351%	84,933
1975	0	0	0	7.089%	6.791%	90,929
1976	0	190	(190)	6.048%	6.021%	96,300
1977	0	0	0	5.788%	6.182%	102,150
1978	0	0	0	7.171%	8.096%	110,096
1979	0	0	0	8.979%	9.671%	120,601
1980	0	0	0	11.500%	11.500%	134,869
<b>Total</b>	<b>55,682</b>	<b>37,407</b>	<b>18,275</b>	<b>-</b>	<b>-</b>	<b>134,869</b>

- (a) Overpayment or underpayment for each calendar year - column (1) minus column (2).
- (b) Interest rates shown are annual rates. Interest is credited daily at applicable rates on funds deposited in the State's Surplus Money Investment Fund.
- (c) Amounts shown are end-of-year balances. Interest on overpayments is credited at applicable Surplus Money Investment Fund Interest Rates Shown in columns (4) and (5). Interest on underpayments is charged at the 1980 Project Interest Rate of 4.584 percent.

**TABLE B-9 Capital Costs of Requested Excess Peaking Capacity**

(in dollars)

Sheet 2 of 2

Reach Number	ANNUAL REQUIRED ADVANCE OF FUNDS													Reach Total
	Incremental Costs and Advance Payments by Calendar Year													
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1981	
	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
<b>THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA</b>														
<i>Incremental Costs</i>														
8C		1,000	1,000											2,000
8D		43,500	43,500											87,000
9		27,000	27,000	13,500										67,500
10A		29,700	29,700	14,800										74,200
11B	10,100	18,300	18,300	9,200										55,900
12D	1,800		19,300	25,800	12,900									59,800
12E	1,800		12,400	18,800	10,800									43,800
13B			12,600	37,800	31,600									82,000
14A	2,500	500	11,100	80,216	107,504	124,069	37,519	6,413	381	87				370,289
14B	1,200	1,800		19,100	19,100	12,800								54,000
14C	1,800	900		13,500	13,500	9,000								38,700
15A	700		14,000	66,947	133,357	128,099	54,821	5,327	946	2,076				406,273
16A	700		18,900	137,894	182,000	211,608	133,927	26,203	5,767	6,156				723,155
17E		51,500	444,600	537,247	860,024	998,985	699,281	193,286	17,947	29,456	2,085			3,834,411
17F	109,100	261,600	261,600	261,600	261,600	239,500								1,395,000
25			964,270	1,650,947	1,426,925	673,041	221,100	256,165						5,192,448
28J		304,612	13,706	296,668	65,966	230,169	1,209,586	2,017,134	235,900	4,900				4,378,641
Total	129,700	740,412	1,891,976	3,184,019	3,125,276	2,627,271	2,356,234	2,504,528	260,941	42,675	2,085			16,865,117
<i>Current Adjustment</i>														
8C through 25	1. Advance Payments Applied to Incremental Costs Amendment 2 (d)													
	0	8,056,000	9,094,963	1,523,252	8,310,651	3,426,736	1,086,045	(4,244,807)	(14,381,396)				(356,668)	12,514,776
28J	2. Interest Credits-Amendment 2 (e)													
									(1,532,433)				(10,104,646)	(11,637,079)
	3. Advance Payments Applied to Incremental Costs Amendment 5 (f)													
	0	1,240,000	1,483,180	2,469,325	(927,035)	1,729,160	3,215,258	2,967,475	1,690,000	(9,488,722)				4,378,641
	4. Interest Credits-Amendment 5 (g)													
										(2,721,803)				(2,721,803)
	5. Net Required Advance of Funds													
	0	9,296,000	10,578,143	3,992,577	7,383,616	5,155,896	4,301,303	(1,277,332)	(14,233,829)	(12,210,525)			(h) (10,461,314)	2,524,535
<b>SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT</b>														
<i>Incremental Costs</i>														
25			25,730	44,053	38,075	17,959	5,900	6,835						138,552
			25,730	44,053	38,075	17,959	5,900	6,835						138,552
<i>Current Adjustments</i>														
	1. Advance Payments Applied to Incremental Costs (d)													
			0	184,422	49,052	44,911	61,588	(20,263)	(174,133)				(7,025)	138,552
	2. Interest Credit													
									(6,332)				(79,108)	(85,440)
	3. Net Required Advance of Funds													
	0	184,422	49,052	44,911	61,588	(20,263)	(180,465)						(h) (86,133)	53,112
<b>ANTELOPE VALLEY-EAST KERN WATER AGENCY</b>														
<i>Incremental Costs</i>														
29A				1,645	6,326	13,376	10,048	2,018	308	96		190		34,007
29F						1,700	1,700							3,400
				1,645	6,326	15,076	11,748	2,018	308	96		190		37,407
<i>Current Adjustment</i>														
	1. Advance Payments Applied to Incremental Costs (d)													
				85,495	52,625	101,648	34,062	(12,794)	(189,120)	0		0	(34,509)	37,407
	2. Interest Credit													
									(16,234)				(100,360)	(116,594)
	3. Net Required Advance of Funds													
				85,495	52,625	101,648	34,062	(12,794)	(205,354)	0		0	(h) (134,869)	(79,187)

(d) Actual payments are shown for 1965 through 1976 with 1981 adjusted to reflect overpayments and underpayments without interest for prior years.  
 (e) Interest for overpayments and underpayments under provisions of Amendment 2 of the contract.  
 (f) Actual payments are shown for 1965 through 1973 with 1974 adjusted to reflect overpayments and underpayments without interest for prior years.  
 (g) Interest for overpayments and underpayments under provisions of Amendment 5 of the contract.  
 (h) Amounts in excess of incremental costs, under the provisions of the contract, reduce the Transportation Charge capital cost component of the Agency's Statement of Charges for January 1981.

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 1 of 8

Calendar Year	UPPER FEATHER DIVISION	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT			
		Reach 1	Reach 2	Reach 3A	Reach 3B	Total	Reach 1	Reach 2	Reach 4	Reach 5
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
1952	0	0	0	0	0	0	97	34	30	57
1953	0	0	0	0	0	0	477	166	144	297
1954	0	0	0	0	0	0	1,466	508	437	959
1955	0	0	0	0	0	0	1,944	674	560	1,266
1956	0	0	0	0	0	0	18,789	6,515	5,090	12,545
1957	0	13,290	3,391	0	9,953	26,634	45,090	15,639	12,285	33,218
1958	2	19,202	5,011	0	25,798	50,011	195,985	80,961	7,714	21,930
1959	14	7,517	2,118	0	17,653	27,288	496,140	148,516	24,945	17,118
1960	28	8,797	4,292	0	4,838	17,927	1,130,378	67,351	71,779	68,028
1961	10	1,551	10,318	0	2,526	14,395	3,273,247	180,596	307,885	74,398
1962	32	217	(1,751)	0	414	(1,120)	1,548,884	203,535	695,446	35,102
1963	51	2,510	(1,063)	0	983	2,430	480,716	203,535	2,284,291	206,587
1964	7,791	39,879	12,046	0	21,934	73,859	2,549,118	15,903	181,900	264,410
1965	3,139	72,793	17,900	0	170,361	261,054	807,505	153,454	85,425	447,830
1966	(48)	59,615	12,972	0	438,949	511,536	898,074	149,529	142,096	1,690,200
1967	47	47,257	11,597	0	1,551,023	1,609,877	607,614	50,423	293,304	3,496,284
1968	51,573	70,586	19,560	0	831,158	921,304	965,119	19,543	89,300	2,931,101
1969	234,232	63,650	23,628	0	46,428	133,706	455,173	9,618	3,860	896,727
1970	16,227	59,090	42,733	0	9,415	111,238	52,481	3,380	10,517	154,358
1971	27,204	20,819	31,516	0	8,480	60,815	24,505	4,645	5,035	20,395
1972	9	15,538	12,952	0	10,058	38,548	26,918	825	2,945	26,090
1973	25	18,488	29,018	0	39,878	87,384	24,468	4,010	6,016	12,708
1974	45	67,352	29,978	0	134,332	231,662	17,108	1,192	1,765	65,587
1975	21	62,855	73,112	0	45,091	181,058	57,619	561	1,165	7,291
1976	51	52,419	75,611	218	13,168	141,416	104,242	2,846	8,915	12,701
1977	28	53,274	65,662	2,240	23,138	144,314	176,062	3,625	3,225	16,158
1978	38	61,936	57,158	2,955	28,987	151,036	264,581	4,494	3,668	14,028
1979	23	316,620	91,367	3,953	62,240	474,180	111,106	17,151	8,515	31,725
1980	26	422,804	111,600	19,910	96,125	650,439	368,942	17,708	8,249	38,045
1981	34	430,992	147,295	(10,752)	43,157	610,692	(145,428)	3,600	6,533	12,448
1982	11	934,812	357,720	(7,165)	134,408	1,419,775	(44,778)	18,971	7,451	37,824
1983	19	1,091,091	1,076,627	2,628	517,615	2,687,961	429,225	73,925	38,185	72,415
1984	26	1,875,968	2,317,661	3,290	1,068,363	5,265,282	506,951	36,354	9,610	92,846
1985	29	2,248,491	7,849,886	27,815	3,416,370	13,542,562	34,103	2,822	5,034	27,138
1986	31	16,420,238	10,020,277	1,309,599	1,819,349	29,569,463	85,732	14,715	17,144	13,982
1987	32	11,873,826	7,214,307	1,628,932	1,670,596	22,387,661	126,377	15,693	27,881	32,931
1988	55	3,287,756	1,648,431	1,015,971	686,821	6,638,979	290,505	36,744	51,786	25,078
1989	44	1,056,583	950,985	224,567	374,886	2,607,021	130,609	16,848	35,518	12,582
1990	63	493,522	537,881	145,694	71,938	1,249,035	275,732	32,387	99,251	40,263
1991	54	76,599	17,130	24,846	70,542	189,117	1,153,109	26,900	53,613	21,889
1992	42	56,492	6,525	18,333	37,778	119,128	401,906	53,036	61,799	51,386
1993	30	104,317	24,579	40,129	82,032	251,057	313,476	55,679	79,149	39,293
1994	14	68,065	13,463	27,107	45,909	154,544	(211,712)	29,017	362,585	36,350
1995	3	26,002	5,920	7,337	20,617	59,876	265,751	42,516	48,189	21,436
1996	0	14,790	3,334	6,614	14,606	39,344	139,573	13,049	25,751	10,677
1997	3	67,264	35,545	38,585	(13,571)	127,623	203,476	31,135	36,986	16,906
1998	7	15,410	6,392	6,797	10,396	38,995	67,974	6,120	14,731	4,616
1999	2	71,950	35,515	33,879	32,613	173,957	162,161	25,329	35,716	24,347
2000	24	29,992	8,327	11,710	4,156	54,185	100,654	15,688	24,144	19,652
2001	20	10,597	3,904	3,892	1,954	20,347	436,756	4,272	118,836	4,207
2002	14	27,018	18,971	15,254	4,614	65,857	3,068,535	5,648	329,244	64,425
2003	0	14,733	9,243	4,658	46,313	74,947	4,465,569	200,125	199,457	360,387
2004	0	23,929	2,214	2,341	145,290	173,774	1,257,335	120,340	131,702	99,547
2005	0	89,369	216	9	33,947	123,541	1,224,486	119,298	260,893	(81)
2006	5	28,336	298	145	879,439	908,219	2,840,723	68,417	259,635	572
2007	0	61,402	40	35	3,219,048	3,280,524	3,069,791	15,211	70,835	1,915
2008	4	75,166	6,097	5,347	7,878,430	7,965,040	5,592,562	35,913	169,940	5,124
2009	13	27,617	866	463	1,188,847	1,217,792	9,803,255	1,029,805	1,545,796	2,406
2010	0	5,236	259	240	395,413	401,149	6,234,944	104,404	441,736	14,866,232
2011	1	11,210	5,672	5,037	149,646	171,566	9,878,571	1,578,705	3,734,755	3,419,894
2012	0	404,424	4,934	15,200	222,378	646,936	7,249,013	764,705	2,261,301	99,746
2013	0	514,357	18,400	40,644	224,600	798,001	1,757,583	620,973	1,139,661	58,797
2014	0	375,090	0	11,448	176,359	562,897	202,353	43,032	172,127	22,292
2015	0	336,705	0	0	163,295	500,000	125,281	28,240	112,959	7,116
2016	0	32,997	0	0	16,003	49,000	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>341,149</b>	<b>43,840,406</b>	<b>33,089,640</b>	<b>4,689,905</b>	<b>28,447,087</b>	<b>110,067,036</b>	<b>76,196,001</b>	<b>6,522,200</b>	<b>16,256,440</b>	<b>30,223,782</b>



**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 2 of 8

Calendar Year	SOUTH BAY AQUEDUCT (continued)					CALIFORNIA AQUEDUCT NORTH SAN JOAQUIN DIVISION			
	Reach 6	Reach 7	Reach 8	Reach 9	Total	Reach 1	Reach 2A	Reach 2B	Subtotal
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1952	8	66	72	132	496	4,012	3,279	1,499	8,790
1953	38	327	336	640	2,425	10,559	8,589	3,964	23,112
1954	123	1,005	1,003	1,954	7,455	13,796	11,163	5,179	30,138
1955	160	1,293	1,149	2,454	9,500	7,370	5,952	2,760	16,082
1956	1,559	11,959	11,043	28,372	95,872	9,880	5,020	2,398	17,298
1957	3,659	28,675	27,385	563,114	729,065	11,953	5,456	2,612	20,021
1958	2,243	17,572	17,385	560,904	904,994	18,585	17,191	7,994	43,770
1959	357	3,200	3,568	149,874	843,718	123,170	100,306	45,510	268,986
1960	1,102	2,944	4,498	359,749	1,705,829	191,408	102,136	48,968	342,512
1961	4,726	18,325	22,765	(1,367)	3,880,575	153,765	195,947	42,843	392,555
1962	17,295	160,939	178,242	209,042	3,048,485	612,258	491,225	168,218	1,271,701
1963	265,414	1,250,386	939,832	129,902	5,626,310	1,993,284	1,525,734	684,095	4,203,113
1964	100,603	1,716,371	2,327,770	2,947,522	10,103,597	4,674,280	2,369,858	700,074	7,744,212
1965	42,345	368,476	637,266	1,921,844	4,464,145	5,877,189	6,873,699	2,975,719	15,726,607
1966	17,663	34,915	140,350	777,887	3,850,714	8,553,362	14,112,820	5,677,099	28,343,281
1967	(41,567)	137,856	147,183	379,764	5,070,861	9,678,607	10,672,113	6,646,739	26,997,459
1968	84,553	2,130	68,057	253,152	4,412,955	6,392,664	891,681	1,303,186	8,587,531
1969	4,279	11,572	162,300	32,000	1,575,529	3,542,767	792,259	443,924	4,778,950
1970	2,487	6,820	20,086	(15,718)	234,411	2,236,607	149,692	115,578	2,501,877
1971	4,350	6,923	17,750	39,084	122,687	98,138	215,512	69,410	383,060
1972	1,084	203	4,800	32,199	95,064	159,608	43,721	7,744	211,073
1973	288	989	7,449	9,693	65,621	105,581	25,496	22,418	153,495
1974	527	6,020	30,628	11,433	134,260	177,700	16,627	45,707	240,034
1975	126	679	1,086	3,464	7,191	239,144	14,680	169,676	423,500
1976	701	3,529	8,362	26,186	167,482	641,860	45,533	65,943	753,336
1977	270	1,310	8,651	24,938	234,239	274,381	20,283	22,568	317,232
1978	231	1,204	1,631	17,123	306,960	801,265	36,221	9,714	847,200
1979	1,367	1,721	2,134	7,322	181,041	1,051,792	59,685	26,106	1,137,593
1980	1,321	1,718	2,182	7,102	445,267	4,173,603	96,760	38,789	4,309,152
1981	308	1,462	1,398	5,077	(114,602)	(502,921)	1,487,516	38,451	1,023,046
1982	716	1,561	1,746	6,074	29,565	700,738	46,501	22,308	769,547
1983	407	5,721	8,143	23,367	651,388	706,104	84,435	211,619	1,002,158
1984	269	1,853	1,667	13,301	662,851	1,559,539	41,352	48,478	1,649,369
1985	402	1,657	2,129	6,750	80,035	677,955	24,812	19,404	722,171
1986	1,119	2,744	3,313	12,234	150,983	398,788	63,830	35,420	498,038
1987	1,496	3,081	3,560	21,842	232,861	799,672	88,945	41,659	930,276
1988	5,706	6,689	7,603	33,728	457,839	2,898,156	(128,051)	(56,448)	2,713,657
1989	2,641	3,878	4,755	14,489	221,320	6,898,872	346,589	173,993	7,419,454
1990	5,092	19,899	36,584	87,796	597,004	13,483,785	112,002	2,446,232	16,042,019
1991	1,942	5,059	7,357	31,682	1,301,551	13,914,632	133,121	114,981	14,162,734
1992	1,184	2,042	2,250	35,464	609,067	6,260,482	241,456	239,437	6,741,375
1993	3,618	6,028	8,873	42,200	548,316	2,542,869	257,330	200,072	3,000,271
1994	2,897	4,781	5,346	89,991	471,255	1,145,666	148,396	88,357	1,382,419
1995	11,556	3,635	14,769	24,750	432,602	1,462,211	217,940	131,995	1,812,146
1996	3,092	2,271	2,699	12,522	209,634	874,227	74,153	41,215	989,595
1997	1,454	4,141	3,655	20,589	318,342	2,064,446	146,851	84,303	2,295,600
1998	363	1,134	(6,005)	5,776	94,709	729,475	33,695	16,670	779,840
1999	1,533	3,304	12,727	31,634	296,751	2,208,776	88,951	90,639	2,388,366
2000	2,406	4,944	5,331	10,755	183,575	(706,517)	57,503	40,185	(608,829)
2001	91,721	68,849	404,226	1,190,653	2,319,521	371,407	91,792	8,926	472,124
2002	229,409	453,259	1,107,580	2,977,939	8,236,039	388,781	44,543	22,639	455,963
2003	67,216	509,964	477,926	1,409,228	7,689,872	178,162	22,779	13,565	214,507
2004	3,193	3,100	39,326	3,276,907	4,931,451	892,410	15,333	77,640	985,383
2005	5,341	5,271	4,848	731,512	2,351,567	294,112	40,135	98,505	432,751
2006	1,298	1,355	1,364	15,425	3,188,790	315,146	15,229	178,089	508,465
2007	7,478	7,479	7,478	10,751	3,190,938	298,687	58,266	122,056	479,009
2008	8,421	8,737	8,938	12,436	5,842,071	767,885	39,837	85,661	893,383
2009	3,153	3,389	3,470	5,076	12,396,350	424,939	42,671	30,960	498,570
2010	786	792	782	1,186	21,650,862	96,910	9,126	2,869	108,905
2011	1,967	3,317	1,955	4,056	18,623,221	203,817	64,980	12,400	281,197
2012	35,194	96,457	47,814	366,205	10,920,435	455,273	204,266	69,909	729,447
2013	111,434	82,073	61,493	182,665	4,014,679	9,196,812	257,785	274,596	9,729,193
2014	43,032	43,032	43,032	61,809	630,709	4,652,124	212,402	4,851,966	9,716,492
2015	28,240	28,240	28,240	40,562	398,878	921,479	112,809	136,389	1,170,677
2016	0	0	0	0	0	133,308	0	0	133,308
2017	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,203,396</b>	<b>5,200,625</b>	<b>7,161,335</b>	<b>19,296,197</b>	<b>162,059,976</b>	<b>129,536,795</b>	<b>43,707,927</b>	<b>29,371,575</b>	<b>202,616,297</b>

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 3 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SAN LUIS DIVISION						SOUTH SAN JOAQUIN DIVISION		
	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7	Subtotal	Reach 8C	Reach 8D	Reach 9
[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	
1952	2,492	3,549	3,987	1,010	1,390	12,428	13	727	1,109
1953	6,999	10,144	10,986	2,834	3,869	34,832	45	2,671	4,185
1954	8,704	12,545	13,693	3,520	4,766	43,228	50	2,719	4,026
1955	4,273	6,055	6,813	1,728	2,325	21,194	19	888	1,100
1956	3,295	5,600	5,857	1,445	3,556	19,753	98	3,850	4,376
1957	3,543	6,115	6,357	1,565	3,998	21,578	234	10,604	13,209
1958	11,927	19,393	22,037	5,509	7,512	66,378	375	19,033	25,073
1959	21,979	37,358	39,689	9,813	19,679	128,518	436	20,578	25,697
1960	207,025	45,419	41,044	12,074	37,633	343,195	1,673	44,565	25,290
1961	184,443	292,639	170,559	38,338	70,068	756,047	3,949	75,726	30,852
1962	495,836	549,984	252,698	22,397	26,967	1,347,882	6,131	159,481	62,375
1963	2,772,189	2,034,351	2,498,712	66,353	30,647	7,402,252	5,861	161,252	81,343
1964	4,348,311	4,932,301	1,053,227	161,422	251,461	10,746,722	4,014	90,622	117,907
1965	3,860,997	5,688,252	2,869,931	1,072,111	667,768	14,159,059	15,049	491,042	564,036
1966	2,312,372	8,527,843	5,765,798	4,230,221	7,708,334	28,544,568	201,274	5,197,322	2,539,278
1967	(44,527)	2,062,305	6,942,522	222,885	6,675,398	15,858,583	212,285	4,982,844	3,363,650
1968	119,884	395,689	973,956	179,917	461,031	2,130,477	64,234	611,192	940,074
1969	(6,065)	126,946	98,492	107,486	160,668	487,527	58,960	116,146	85,130
1970	32,387	(20,243)	105,385	(827,457)	1,215,966	506,038	23,011	106,810	84,116
1971	99,945	230,624	305,227	26,995	341,010	1,003,801	8,813	33,099	23,088
1972	15,990	90,852	17,053	14,621	281,343	419,859	10,818	13,349	16,603
1973	6,753	103,707	41,549	13,810	41,427	207,246	5,145	11,089	13,249
1974	6,618	117,165	55,978	16,199	71,796	267,756	5,434	24,433	16,567
1975	18,921	107,275	23,671	8,797	152,574	311,238	5,424	15,960	12,966
1976	17,485	79,554	13,041	5,138	41,687	156,905	19,931	76,280	62,164
1977	35,707	84,669	9,412	4,028	9,655	143,471	21,096	70,005	97,952
1978	8,539	428,395	7,006	3,536	6,994	454,470	7,584	40,453	17,395
1979	(35,394)	543,225	19,463	9,485	(242,253)	234,526	10,474	6,181	6,227
1980	66,622	3,450,695	191,307	75,209	185,384	3,969,217	2,158	17,492	17,706
1981	28,491	(2,244,127)	(44,017)	(15,456)	918,984	(1,356,125)	1,151	9,642	9,541
1982	100,629	(1,616,569)	20,184	10,359	3,525,738	2,040,341	2,469	8,283	6,956
1983	75,639	33,881	11,785	6,638	1,811,638	1,939,581	7,955	13,782	11,090
1984	31,748	87,083	26,712	12,754	3,053,662	3,211,959	26,489	9,959	6,268
1985	53,251	56,732	13,685	6,934	582,910	713,512	7,220	9,762	7,688
1986	73,979	201,509	50,668	19,223	1,282,469	1,627,848	8,902	25,011	20,503
1987	(7,829)	116,268	40,009	15,946	518,349	682,743	12,744	18,927	56,042
1988	(149,385)	224,154	(406,398)	(137,353)	923,622	454,640	9,833	(119,741)	(60,639)
1989	39,652	594,894	232,852	80,090	575,855	1,523,343	5,279	91,501	278,061
1990	39,270	259,895	79,589	29,606	461,219	869,579	5,814	41,345	2,016,434
1991	4,916,134	397,959	98,847	35,860	511,519	5,960,319	4,588	43,140	41,348
1992	(757,001)	545,729	211,854	74,544	396,398	471,524	3,546	103,695	109,225
1993	110,233	724,929	186,271	70,815	720,283	1,812,531	15,016	101,634	90,929
1994	1,151,976	288,018	63,862	27,812	710,770	2,242,438	6,770	42,455	40,696
1995	285,776	441,479	130,761	58,640	1,914,186	2,830,842	12,548	49,963	43,251
1996	31,942	(110,471)	34,529	12,219	588,712	556,931	6,444	29,863	27,050
1997	73,224	513,793	(277,781)	42,881	5,016,215	5,368,332	11,497	49,111	43,799
1998	19,692	304,115	34,319	16,542	2,819,556	3,194,224	2,562	11,115	8,955
1999	18,187	158,902	100,061	41,691	1,901,382	2,220,222	5,706	25,179	23,510
2000	101,618	373,699	78,036	36,186	1,139,073	1,728,613	3,922	23,591	29,281
2001	(10,513)	(47,112)	519,031	(3,546)	61,595	519,455	2,280	17,030	21,196
2002	12,237	24,434	6,079,343	3,454	(2,453,483)	3,665,985	3,627	44,010	20,221
2003	8,864	79,647	(5,377,004)	7,923	2,183,795	(3,096,775)	2,130	18,793	16,716
2004	(16,126)	(14,365)	(50,563)	(2,487)	(459,225)	(542,766)	22,520	5,980	3,879
2005	261	11,360	129,470	3,529	995,531	1,140,151	26,301	11,593	6,323
2006	1,421	27,658	(10,639)	1,444	(366,505)	(346,620)	6,106	2,942	1,621
2007	2	87,855	39,476	7,718	(120,678)	14,373	13,352	21,920	11,909
2008	14,780	16,097	46,719	13,920	1,110,583	1,202,099	9,017	13,020	7,277
2009	934	216,920	45,727	5,164	(42,304)	226,441	2,380	16,160	8,894
2010	(16)	1,560,454	130,995	655	(347,589)	1,344,499	(1)	1,824	989
2011	57	641,814	479,522	574	76,704	1,198,671	3	1,861	1,017
2012	19	198,367	(16,225)	23,274	157,725	363,159	73	50,805	27,700
2013	0	383,342	2,987,865	45,095	108,866	3,525,168	3,970	133,950	78,126
2014	0	<b>1,514,368</b>	<b>1,295,860</b>	<b>49,770</b>	<b>99,545</b>	<b>2,959,543</b>	<b>90</b>	<b>92,769</b>	<b>50,521</b>
2015	0	811,268	166,951	26,433	52,870	1,057,522	0	48,655	26,433
2016	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>20,836,397</b>	<b>36,836,386</b>	<b>28,717,806</b>	<b>6,119,840</b>	<b>48,672,622</b>	<b>141,183,051</b>	<b>946,891</b>	<b>13,475,944</b>	<b>11,349,553</b>

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 4 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN DIVISION (continued)									
	Reach 10A	Reach 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A	
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	
1952	695	1,279	1,980	995	1,663	794	212	212	1,911	
1953	2,569	4,790	7,480	3,745	6,236	2,599	733	741	7,016	
1954	4,821	4,855	7,565	3,792	6,319	2,880	810	817	7,073	
1955	1,097	1,557	2,404	1,211	2,025	1,183	325	327	2,253	
1956	4,428	6,223	9,233	4,737	8,054	7,026	1,638	1,584	9,939	
1957	13,269	18,772	29,082	14,615	24,411	15,651	3,834	3,864	26,871	
1958	25,086	48,191	78,564	39,087	61,715	33,726	12,330	11,813	49,499	
1959	25,787	67,246	107,781	53,836	86,478	64,824	22,102	21,828	70,838	
1960	47,492	66,317	77,936	39,867	63,517	84,363	23,260	22,305	73,305	
1961	68,505	46,073	88,274	51,457	28,015	242,753	91,290	65,565	150,205	
1962	57,705	56,056	69,189	44,851	49,179	208,180	61,489	47,608	133,653	
1963	52,585	91,914	173,985	86,405	67,733	425,626	104,436	77,970	102,072	
1964	124,014	333,621	291,013	174,469	86,271	1,093,795	684,005	485,033	571,173	
1965	622,257	1,053,029	1,524,848	1,044,851	196,487	3,385,205	1,655,024	1,436,258	476,830	
1966	2,800,056	3,709,779	673,429	466,228	418,141	4,916,319	974,862	724,354	1,829,852	
1967	3,652,342	4,636,627	1,881,333	1,244,265	1,238,428	2,788,299	525,653	400,183	1,721,304	
1968	1,025,989	1,323,302	4,726,074	3,145,775	8,343,706	10,210,266	1,330,361	1,405,117	7,522,015	
1969	145,111	229,185	706,272	529,080	3,704,065	15,112,041	1,223,457	1,134,395	9,523,012	
1970	74,366	85,151	70,725	72,798	320,797	11,031,255	987,213	738,955	8,836,897	
1971	15,595	45,006	43,988	42,624	339,078	2,925,191	193,255	36,514	3,275,227	
1972	19,736	32,657	43,939	24,748	81,937	1,388,348	101,784	20,165	1,003,380	
1973	14,283	16,448	9,980	16,320	25,090	680,834	19,584	13,469	798,805	
1974	22,111	14,951	19,555	32,240	29,582	524,504	30,735	16,333	778,696	
1975	15,865	13,479	10,793	13,678	25,827	269,197	25,164	21,048	370,265	
1976	76,202	54,217	37,464	59,842	105,332	507,519	59,753	42,776	434,574	
1977	75,628	52,919	22,826	54,444	81,293	301,515	49,972	30,152	235,514	
1978	48,754	16,469	(2,816)	27,331	43,126	348,674	(653)	1,500	297,817	
1979	241	6,906	13,401	14,229	25,411	293,786	9,846	7,856	245,590	
1980	18,165	18,813	15,608	27,498	34,190	1,676,267	29,169	23,023	1,719,775	
1981	10,309	14,885	26,473	20,972	25,515	(1,076,221)	27,551	33,674	(1,142,721)	
1982	8,237	6,608	7,680	8,346	16,339	(745,914)	9,886	29,393	(804,147)	
1983	14,488	9,792	14,174	13,050	35,872	419,650	17,389	24,933	115,983	
1984	7,533	27,613	87,907	49,271	22,732	54,590	75,453	63,060	63,537	
1985	9,215	6,949	5,263	8,013	8,875	(49,408)	9,523	5,867	54,782	
1986	22,335	16,664	16,014	25,031	20,483	140,642	25,960	13,913	154,089	
1987	16,704	13,512	12,369	20,023	15,435	101,453	20,411	8,581	227,047	
1988	(159,357)	(73,648)	(151,040)	(51,401)	(120,104)	161,077	(75,276)	(75,307)	144,369	
1989	70,153	65,216	63,382	120,925	73,037	2,778,880	119,559	36,660	2,952,046	
1990	34,841	29,230	27,269	49,082	34,048	715,031	44,187	14,537	440,017	
1991	36,888	32,195	30,146	55,119	34,144	423,235	50,345	12,116	353,596	
1992	103,321	99,765	98,178	192,455	97,638	991,603	185,311	9,210	387,615	
1993	90,291	70,131	63,247	118,440	80,530	687,462	109,792	38,960	942,211	
1994	65,737	29,221	26,997	50,234	35,154	400,534	44,481	17,426	324,942	
1995	435,909	32,487	25,516	49,885	41,733	524,524	48,740	29,125	450,952	
1996	253,433	19,489	15,020	30,202	29,333	403,125	26,945	16,405	253,622	
1997	73,458	30,890	25,368	48,767	40,900	451,910	47,815	29,878	809,848	
1998	14,618	7,107	5,773	10,697	9,676	288,667	10,799	6,819	119,562	
1999	47,359	17,022	13,362	34,410	31,539	260,623	24,634	14,826	264,538	
2000	43,459	21,186	32,480	40,180	25,119	168,825	15,243	11,006	151,512	
2001	42,731	14,471	22,325	34,995	8,027	71,645	4,537	3,988	66,918	
2002	87,805	19,626	7,157	78,600	47,505	276,160	22,632	34,980	164,596	
2003	22,946	9,280	8,935	18,115	15,308	136,433	6,671	9,686	110,492	
2004	5,493	3,291	4,188	7,001	5,787	52,563	5,588	1,490	50,520	
2005	7,316	6,332	12,579	6,307	6,354	21,617	12,567	44	9,079	
2006	1,872	1,680	3,146	1,618	1,736	5,936	3,109	108	2,695	
2007	13,807	11,909	23,818	11,909	11,910	40,392	23,818	1	16,745	
2008	8,919	6,999	12,960	8,044	8,187	35,363	13,537	568	22,711	
2009	10,504	8,926	16,976	9,236	9,565	35,656	17,158	450	18,753	
2010	1,148	985	1,985	990	981	3,325	1,988	(7)	1,362	
2011	1,177	1,031	2,010	1,016	1,044	3,554	2,002	26	1,530	
2012	32,469	27,514	54,437	28,290	28,359	111,560	54,891	316	57,917	
2013	110,122	67,554	103,298	110,747	114,034	1,232,328	128,557	16,968	1,074,085	
2014	59,020	50,281	99,843	51,263	51,338	192,041	100,418	386	176,104	
2015	30,648	26,433	52,870	26,433	26,433	89,647	52,870	0	37,161	
2016	0	0	0	0	0	0	0	0	0	
2017	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	10,687,642	12,788,458	11,614,011	8,623,281	16,398,674	67,951,128	9,510,733	7,201,851	48,349,428	

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 5 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN (contd.)		TEHACHAPI DIVISION			MOJAVE DIVISION				
	Reach 16A	Subtotal	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 19C	Reach 20A	
[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]		
1952	4,440	16,030	9,703	4,072	13,775	4,090	1,520	0	2,561	
1953	16,513	59,323	31,337	13,284	44,621	12,610	4,685	0	7,246	
1954	16,601	60,328	46,243	20,010	66,253	16,642	6,184	0	9,506	
1955	5,223	19,612	25,880	11,362	37,242	5,612	2,086	0	2,529	
1956	21,754	82,940	47,487	17,609	65,096	6,038	2,244	0	2,440	
1957	62,657	237,073	119,673	49,130	168,803	22,348	8,304	0	9,035	
1958	133,083	537,575	164,056	72,981	236,147	37,917	14,166	123	15,391	
1959	205,748	773,179	151,389	57,883	209,272	38,620	23,450	1,102	23,605	
1960	204,788	774,678	203,222	45,323	248,545	21,356	26,093	5,318	40,523	
1961	206,305	1,148,969	387,819	85,558	473,377	35,664	32,281	2,262	34,918	
1962	171,396	1,127,293	353,119	82,610	435,729	68,508	266,284	1,841	10,323	
1963	481,941	1,913,123	1,191,633	124,757	1,316,390	37,379	435,881	4,137	39,706	
1964	1,778,952	5,834,889	1,866,000	775,005	2,641,005	95,693	706,369	8,564	43,342	
1965	1,268,176	13,733,092	2,574,824	4,859,869	4,859,869	121,060	716,092	9,156	108,519	
1966	2,896,274	27,347,168	5,537,412	9,323,517	14,860,929	366,116	1,644,699	13,373	159,282	
1967	3,442,021	30,089,234	26,239,390	12,398,708	38,638,098	1,312,022	903,880	24,103	645,078	
1968	7,578,498	48,226,583	33,363,479	7,416,464	40,779,943	136,804	7,109,653	71,388	1,889,601	
1969	13,136,056	45,702,910	40,368,425	6,883,206	47,251,631	213,805	2,465,641	7,423	5,939,151	
1970	13,890,751	36,322,845	35,446,706	6,786,231	42,232,937	2,211,077	1,210,665	6,217	3,652,478	
1971	7,903,937	14,885,415	20,141,395	6,835,303	26,976,698	1,496,843	284,738	6,994	1,074,759	
1972	3,025,555	5,783,019	10,002,935	34,791	10,037,726	129,417	409,903	3,620	471,963	
1973	1,472,313	3,096,609	3,090,140	36,207	3,126,347	23,931	75,638	2,539	88,416	
1974	1,031,843	2,546,984	4,798,348	152,494	4,950,842	28,399	205,581	2,703	138,673	
1975	489,545	1,289,211	2,144,178	411,404	2,555,582	44,774	70,652	5,066	68,157	
1976	618,049	2,154,103	1,124,357	174,629	1,298,986	121,043	84,593	6,786	59,967	
1977	580,209	1,673,525	655,047	31,512	686,559	261,400	133,767	7,521	117,878	
1978	582,775	1,428,409	1,900,843	27,956	1,928,799	553,014	57,150	5,872	51,615	
1979	542,554	1,182,702	2,099,385	61,381	2,160,766	626,615	339,536	10,831	37,085	
1980	3,772,498	7,372,362	17,433,610	6,046	17,439,656	1,130,429	1,073,430	3,604	308,188	
1981	(2,527,211)	(4,566,440)	(3,848,206)	6,908	(3,841,298)	1,218,824	845,702	4,498	48,625	
1982	(1,850,736)	(3,296,600)	11,370,112	6,054	11,376,166	6,968,683	746,900	3,920	33,869	
1983	166,232	864,390	8,862,914	8,269	8,871,183	10,909,386	64,660	2,596	40,793	
1984	119,387	613,799	3,227,937	31,701	3,259,638	8,340,371	309,491	3,124	17,505	
1985	82,117	165,866	1,926,289	10,460	1,936,749	5,264,156	227,986	3,885	68,422	
1986	186,348	675,895	1,381,955	33,788	1,415,743	2,049,111	2,069,663	4,261	2,331,707	
1987	194,936	718,184	671,183	13,807	684,990	1,347,722	(6,453)	4,684	562,540	
1988	262,334	(308,900)	1,408,760	(49,734)	1,359,026	847,954	(104,961)	13,409	(159,892)	
1989	5,955,356	12,610,055	504,715	64,660	569,375	376,980	207,150	50,953	31,173	
1990	640,283	4,092,118	783,219	25,218	808,437	202,065	(402,573)	61,192	(637,062)	
1991	774,129	1,890,989	691,578	33,405	724,983	273,021	22,218	81,545	(188,732)	
1992	731,512	3,113,074	741,986	24,369	766,355	620,962	384,568	86,644	225,398	
1993	857,038	3,265,681	1,223,402	35,370	1,258,772	1,131,166	248,287	72,746	110,869	
1994	853,328	1,937,975	806,213	16,681	822,894	998,126	164,096	60,147	51,340	
1995	628,941	2,373,574	1,538,497	19,443	1,557,940	390,433	157,481	45,990	92,925	
1996	388,064	1,498,995	2,571,039	10,797	2,581,836	91,593	69,281	22,188	35,656	
1997	481,458	2,144,699	1,009,249	18,265	1,027,514	135,402	92,607	13,590	65,433	
1998	440,746	937,096	925,574	6,843	932,417	47,486	36,170	4,164	29,900	
1999	361,516	1,124,225	662,144	12,166	674,310	113,232	49,150	5,329	171,935	
2000	372,997	938,802	408,352	14,333	422,685	120,267	90,145	936	83,478	
2001	167,694	477,837	266,815	10,891	277,706	65,580	186,973	2,223	343,775	
2002	286,748	1,093,668	247,986	9,586	257,572	35,787	(139,334)	1,374	(111,675)	
2003	159,978	535,484	189,022	12,339	201,361	84,434	(19,049)	0	(11,367)	
2004	322,068	490,368	372,622	4,637	377,259	19,723	17,430	0	18,763	
2005	43,887	170,299	2,264,602	6,587	2,271,188	27,020	18,910	0	25,134	
2006	11,294	43,863	5,855,349	2,353	5,857,702	7,062	4,978	0	6,373	
2007	82,675	284,166	3,829,554	11,915	3,841,469	49,382	35,729	0	47,637	
2008	63,596	210,197	640,715	7,591	648,306	20,474	19,644	0	28,901	
2009	67,633	222,291	9,987,899	10,348	9,998,247	23,685	25,891	0	33,870	
2010	6,865	22,435	11,126,864	940	11,127,803	25,049	2,960	0	3,965	
2011	7,068	23,340	4,979,760	1,192	4,980,952	2,657	3,077	0	4,040	
2012	212,213	686,542	870,739	28,394	899,133	81,257	81,320	0	108,407	
2013	1,496,052	4,669,791	1,058,960	71,638	1,130,598	272,125	135,290	0	180,389	
2014	<b>442,089</b>	<b>1,366,163</b>	<b>213,554</b>	<b>50,362</b>	<b>263,916</b>	<b>139,797</b>	<b>149,315</b>	<b>0</b>	<b>199,090</b>	
2015	266,176	683,759	2,050,459	26,433	2,076,892	68,192	79,303	0	105,739	
2016	0	0	0	0	0	0	0	0	0	
2017	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	78,295,266	297,192,861	292,339,846	54,821,422	347,161,268	51,548,390	24,189,169	759,941	19,050,858	

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 6 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	MOJAVE DIVISION (continued)							SANTA ANA DIVISION		
	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	
[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]		
1952	892	5,788	35	2,013	2,074	2,413	21,386	3,334	5,599	
1953	3,402	17,846	71	5,752	6,886	7,438	65,936	10,275	17,264	
1954	4,548	23,558	369	8,560	7,849	9,820	87,036	13,566	22,790	
1955	2,213	7,947	178	2,754	2,725	3,313	29,357	4,575	7,687	
1956	2,655	8,542	216	2,905	2,961	3,561	31,562	4,917	8,264	
1957	9,926	31,616	800	10,757	10,962	13,177	116,825	18,205	30,586	
1958	16,752	53,569	1,397	19,717	18,576	22,627	199,237	31,001	52,019	
1959	18,604	56,724	1,844	25,421	20,372	45,646	255,388	39,325	58,137	
1960	37,179	43,893	11,029	136,751	17,152	109,816	449,110	65,655	93,700	
1961	37,102	21,532	14,517	215,859	9,546	373,473	777,154	26,979	56,734	
1962	10,730	8,197	4,186	164,168	4,336	279,421	817,994	9,964	36,235	
1963	40,865	26,670	17,081	237,695	7,228	358,503	1,205,145	31,013	112,271	
1964	71,116	33,912	22,793	262,996	6,863	244,003	1,495,651	69,669	202,642	
1965	343,506	91,095	65,689	827,655	11,836	621,566	2,916,174	279,237	206,356	
1966	1,311,628	160,388	178,538	1,746,245	31,078	1,018,628	6,629,975	415,066	364,004	
1967	1,718,942	498,257	367,961	3,146,128	62,135	2,331,106	11,009,612	3,184,296	638,539	
1968	2,291,691	1,141,929	1,145,768	4,588,850	102,207	2,600,293	21,078,184	8,264,126	1,268,194	
1969	5,626,284	2,358,737	1,515,147	7,750,478	260,659	11,131,406	37,268,731	6,807,783	1,768,456	
1970	5,304,372	3,232,911	2,081,810	23,451,612	1,240,798	16,885,193	59,277,133	2,169,051	7,229,429	
1971	1,091,123	825,070	432,464	16,772,680	1,922,115	5,385,721	29,292,507	1,135,248	9,811,736	
1972	635,507	484,772	324,865	3,788,894	48,049	788,479	7,085,469	1,095,740	5,528,987	
1973	83,840	63,774	36,179	1,623,274	24,333	4,225,877	6,247,801	136,994	1,810,729	
1974	118,639	103,545	54,198	5,699,605	130,567	766,562	7,248,472	68,180	1,922,999	
1975	169,294	167,240	19,453	4,793,580	19,467	373,783	5,731,466	166,653	3,787,797	
1976	102,909	44,896	24,732	3,103,916	84,188	204,705	3,837,735	475,176	1,494,750	
1977	120,160	71,389	49,445	1,654,122	60,112	232,230	2,708,024	76,255	776,085	
1978	68,838	32,855	18,183	677,448	36,484	210,198	1,711,657	57,463	131,076	
1979	36,225	18,948	10,675	560,506	10,634	103,615	1,754,670	29,960	80,482	
1980	284,545	133,526	121,171	2,239,224	60,229	559,963	5,914,309	31,462	181,638	
1981	32,214	13,223	6,466	(774,614)	138,917	203,941	1,737,796	5,864	69,031	
1982	77,988	13,158	14,459	432,274	346,905	79,819	8,717,975	9,224	159,280	
1983	58,714	25,900	10,363	451,428	2,029,405	58,989	13,652,234	4,304	528,764	
1984	35,378	845,423	6,052	(83,811)	1,290,740	34,764	10,799,037	3,850	270,455	
1985	(232,549)	(481,017)	1,945,477	608,583	966,160	51,634	8,422,737	5,555	62,571	
1986	(2,046,222)	(1,334,975)	3,260,280	1,097,122	230,510	51,994	7,713,451	9,927	114,561	
1987	(344,829)	55,519	64,264	3,631,282	146,850	91,223	5,552,802	4,908	27,208	
1988	(147,290)	(70,564)	351,489	552,546	558,557	197,761	2,039,009	7,358	161,957	
1989	60,657	30,217	534,658	4,161,037	1,496,776	433,072	7,382,673	8,092	(2,297,399)	
1990	(403,413)	(635,623)	(97,841)	8,794,258	1,394,698	344,367	8,620,068	176,854	(1,657,576)	
1991	(18,809)	(147,369)	(17,234)	7,985,326	3,624,824	139,105	11,753,895	202,286	(1,316,160)	
1992	338,098	(263,897)	75,210	4,849,560	8,364,426	127,829	14,808,798	333,934	(1,878,502)	
1993	180,598	133,941	49,144	2,094,764	15,390,366	159,211	19,571,092	1,506,787	3,979,221	
1994	114,273	65,260	26,546	933,021	8,082,401	81,869	10,577,079	2,104,588	2,493,097	
1995	121,499	66,503	30,918	1,096,953	5,924,175	123,653	8,050,530	3,310,564	500,791	
1996	48,699	44,953	17,787	1,736,686	2,181,665	96,339	4,344,851	19,019,751	(100,474)	
1997	39,973	55,881	27,865	809,666	(342,563)	102,390	1,000,244	7,645,602	(662,524)	
1998	27,626	20,285	12,816	273,139	3,392,776	36,135	3,880,497	993,619	1,613,505	
1999	58,392	37,660	17,874	1,006,721	2,208,657	123,472	3,792,421	224,119	843,638	
2000	75,230	44,857	20,181	724,837	1,251,684	83,871	2,495,486	129,156	1,285,637	
2001	121,907	77,799	54,526	550,843	342,964	26,780	1,773,369	73,031	447,282	
2002	(82,663)	(7,369)	(43,431)	270,386	269,139	71,793	264,008	54,815	1,753,554	
2003	(7,564)	(3,238)	(3,009)	382,025	146,659	30,255	599,147	86,731	350,997	
2004	12,619	13,744	5,414	262,810	48,570	12,285	411,358	13,577	275,709	
2005	18,874	25,074	6,335	62,967	104,838	144,149	433,303	16,962	120,279	
2006	4,511	5,983	1,500	15,163	294,318	577,859	917,747	21,932	16,665	
2007	35,725	47,634	11,908	151,063	919,040	69,935	1,368,052	12,905	55,918	
2008	19,526	25,456	6,313	346,638	3,113,899	2,019,852	5,600,705	2,481	82,555	
2009	24,745	32,909	8,241	940,452	448,164	1,834,401	3,372,357	2,972	260,999	
2010	2,992	3,992	997	2,207,142	26,737	1,373,264	3,647,098	(3)	119,968	
2011	2,966	3,947	988	5,917,166	4,612	99,900	6,039,352	11	31,884	
2012	81,282	108,375	27,093	10,065,497	81,296	20,072	10,654,598	4	405,081	
2013	135,290	180,389	45,095	1,461,333	2,509,269	0	4,919,180	0	2,508,160	
2014	149,315	199,090	49,770	626,755	321,688	0	1,834,820	0	4,923,327	
2015	79,303	105,739	26,433	262,814	218,359	0	945,882	0	2,574,288	
2016	0	0	0	0	0	0	0	0	0	
2017	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
<b>TOTAL</b>	<b>18,238,442</b>	<b>9,107,982</b>	<b>13,075,741</b>	<b>147,422,399</b>	<b>71,749,909</b>	<b>57,814,520</b>	<b>412,957,351</b>	<b>60,712,929</b>	<b>55,828,933</b>	



**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 7 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)				WEST BRANCH					
	Reach 28G (a)	Reach 28H	Reach 28J	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	
[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[64]		
1952	4,785	4,055	3,020	20,793	2,924	136	175	459	553	
1953	15,580	11,511	9,476	64,106	9,093	344	237	1,754	1,683	
1954	18,015	18,100	12,160	84,631	7,389	1,201	2,229	2,350	4,162	
1955	6,052	6,081	4,151	28,546	1,019	585	1,086	1,147	2,029	
1956	6,496	6,525	4,480	30,682	490	698	1,297	1,366	2,420	
1957	24,044	24,156	16,585	113,576	1,809	2,583	4,792	5,057	8,952	
1958	40,844	41,033	28,470	193,367	3,256	4,516	8,714	8,878	15,847	
1959	45,746	45,946	44,331	233,485	7,953	9,150	19,414	18,243	35,583	
1960	59,102	58,548	118,969	395,974	21,753	14,990	34,447	29,764	69,752	
1961	32,226	34,382	674,787	825,108	22,442	12,775	21,559	20,086	39,761	
1962	21,383	20,530	47,484	135,596	40,237	28,729	86,938	58,215	108,962	
1963	43,884	41,698	1,506,440	1,735,306	91,959	69,162	163,347	110,015	211,592	
1964	89,710	45,762	98,569	506,352	150,670	66,420	207,977	143,340	291,404	
1965	96,956	76,899	146,095	805,543	361,811	77,914	403,115	127,430	589,638	
1966	170,878	308,756	589,107	1,847,811	489,512	203,497	1,233,640	348,918	3,231,797	
1967	233,968	283,126	987,832	5,327,761	1,589,715	882,096	1,117,243	891,607	31,088,491	
1968	871,337	266,295	780,587	11,450,539	3,899,363	300,921	396,190	1,104,832	36,157,768	
1969	1,117,873	1,444,654	756,442	11,895,208	6,592,580	336,480	693,348	1,184,454	9,655,871	
1970	1,843,621	1,013,468	2,829,523	15,085,092	7,986,733	6,089,401	2,624,747	3,002,968	8,463,475	
1971	16,095,702	6,401,303	12,111,623	45,555,612	4,247,037	3,768,699	1,120,231	8,244,651	5,844,024	
1972	1,537,880	11,960,791	21,542,747	41,666,145	1,871,831	426,932	985,512	18,787,722	(23,015,734)	
1973	209,664	247,769	3,673,344	6,078,500	775,824	168,064	399,856	9,408,706	1,821,206	
1974	162,178	101,638	1,980,991	4,235,988	560,657	168,878	169,717	3,901,261	(3,454,239)	
1975	157,365	124,399	1,626,274	5,862,486	353,670	421,176	925,693	664,113	609,891	
1976	178,287	118,748	1,497,465	3,764,426	396,809	650,417	1,274,484	706,244	650,209	
1977	127,106	89,036	323,091	1,391,573	390,637	3,018,637	2,152,961	196,012	1,135,148	
1978	147,112	153,867	347,482	837,000	1,427,190	2,219,135	6,694,615	57,817	149,932	
1979	29,723	19,225	225,947	385,337	940,013	2,168,382	19,813,742	597,858	331,313	
1980	137,833	154,821	1,077,900	1,583,654	1,276,793	4,108,143	24,537,814	550,337	204,751	
1981	28,815	22,654	61,349	187,713	(711,751)	2,699,873	19,806,531	94,944	28,852	
1982	16,069	58,900	55,841	299,314	(465,217)	351,251	17,964,617	215,678	42,587	
1983	18,213	89,581	(264,804)	376,058	100,394	180,971	6,751,649	220,029	24,295	
1984	14,462	12,259	49,547	350,573	71,759	68,930	2,870,259	335,942	17,285	
1985	17,816	11,481	54,070	151,493	142,244	25,386	2,126,670	102,366	21,971	
1986	31,564	25,037	86,794	267,883	133,914	62,294	274,660	141,894	36,149	
1987	17,141	8,005	45,528	102,790	13,936	453,949	711,773	192,511	27,931	
1988	41,892	21,113	90,784	323,104	427,544	118,010	1,660,959	203,130	95,930	
1989	28,708	12,619	15,556	(2,196,424)	207,067	430,662	584,186	241,811	97,472	
1990	27,478	12,817	55,408	(1,385,019)	197,428	355,480	386,882	813,211	54,269	
1991	142,139	15,524	62,794	(893,417)	219,321	344,386	453,336	1,132,520	55,176	
1992	34,185	13,422	69,479	(1,427,482)	541,026	295,312	464,421	4,402,524	47,182	
1993	44,300	27,047	162,854	5,720,209	464,987	320,182	643,189	3,361,457	74,198	
1994	16,351	11,673	54,581	4,680,290	203,666	231,527	362,717	306,148	33,758	
1995	35,402	28,202	164,254	4,039,213	344,358	392,647	536,253	468,656	34,007	
1996	76,723	73,629	344,747	19,414,376	150,901	161,394	427,223	203,201	15,357	
1997	50,662	20,720	268,293	7,322,753	298,002	71,310	432,940	276,180	50,095	
1998	10,268	8,970	479,138	3,105,500	346,973	21,003	2,028,979	181,951	49,377	
1999	84,683	45,293	324,223	1,521,955	296,520	37,641	1,080,682	125,373	51,213	
2000	64,095	41,331	114,224	1,634,443	212,174	33,747	238,676	116,588	13,241	
2001	20,193	13,635	88,656	642,797	43,281	6,448	104,127	110,850	10,737	
2002	53,787	12,619	196,949	2,071,724	171,190	30,767	252,912	60,146	7,881	
2003	1,096,665	2,482,179	179,466	4,196,038	50,519	9,141	103,160	57,712	51,000	
2004	1,736,308	856,587	24,559	2,906,739	47,768	6,780	27,718	107,695	215,925	
2005	2,049,655	410,021	270,894	2,867,810	273,482	12,718	54,409	6,642	52,413	
2006	2,302,259	406,071	2,571,775	5,318,702	660,664	3,079	115,825	1,557	2,299,565	
2007	(246)	1,099,958	3,664,358	4,832,893	107,460	25,257	1,958,512	269,569	347	
2008	835,530	899,508	682,829	2,502,902	2,090,139	14,503	103,704	1,001,788	2,089	
2009	4,202,648	976,867	2,819,145	8,262,631	1,931,429	17,722	22,988	1,463,563	631	
2010	43,408	930,165	3,865,738	4,959,276	864,340	2,114	24,691	231,970	(12)	
2011	1,173,995	577	1,955,691	3,162,158	425,260	2,100	2,215	39,980	41	
2012	2,742,045	197,276	2,742,639	6,087,046	612,609	57,465	77,631	26,933	10,200	
2013	4,161,459	700,649	10,134,421	17,504,689	142,508	90,195	646,844	45,095	22,827	
2014	0	0	<b>35,566,872</b>	<b>40,490,199</b>	<b>155,387</b>	<b>99,545</b>	<b>122,488</b>	<b>48,021</b>	<b>11,402</b>	
2015	0	0	53,673,237	56,247,525	32,566	1,084,726	58,999	25,505	0	
2016	0	0	31,622,670	31,622,670	0	1,436,232	0	0	0	
2017	0	0	6,881,028	6,881,028	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	44,744,022	32,669,509	212,336,957	406,292,348	44,325,017	34,774,808	128,577,944	66,808,746	77,811,633	

(a) Includes excess capacity costs (not shown in Table B-9) allocated to MWDSC in the following years and repaid under Article 24(c) of its contract: 1970 - \$362,000; 1971 - \$6,198,000; 1972 - \$139,000.

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 8 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)											Total	GRAND TOTAL
	WEST BRANCH (cont.)		COASTAL BRANCH										
	Reach 30	Subtotal	Reach 31A	Reach 33A	Reach 33B	Reach 34	Reach 35	Reach 37	Reach 38	Subtotal			
[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]	[75]	[76]		
1952	1,408	5,655	0	0	0	0	0	0	0	0	98,857	99,353	
1953	4,346	17,457	0	0	0	0	0	0	0	0	309,387	311,812	
1954	5,743	23,074	0	0	0	0	0	0	0	0	394,688	402,143	
1955	1,943	7,809	0	0	0	0	0	0	0	0	159,842	169,342	
1956	2,077	8,348	0	0	0	0	0	0	0	0	255,679	251,551	
1957	7,684	30,877	0	0	0	0	0	0	0	0	708,753	1,464,452	
1958	13,931	55,142	0	0	0	0	0	0	0	0	1,331,616	2,286,623	
1959	44,384	134,727	28,046	49,114	0	7,441	8,236	0	0	92,837	2,096,392	2,967,412	
1960	84,703	255,409	34,404	70,450	0	8,507	14,265	0	0	127,626	2,937,049	4,660,833	
1961	123,330	239,953	13,801	17,868	0	1,501	3,931	0	0	37,101	4,650,264	8,545,244	
1962	348,366	671,447	10,121	7,798	0	524	1,689	0	0	20,132	5,827,774	8,875,171	
1963	521,491	1,167,566	20,470	14,299	0	880	2,943	0	0	38,592	18,981,487	24,610,278	
1964	1,372,464	2,232,275	315,418	26,963	0	1,687	5,639	0	0	349,707	31,550,813	41,736,060	
1965	3,383,950	4,943,858	747,023	36,178	0	2,118	7,060	0	0	792,379	57,936,405	62,664,743	
1966	9,364,753	14,872,117	2,258,915	35,864	0	1,736	5,764	0	0	2,302,279	124,748,128	129,110,330	
1967	17,618,827	53,187,979	6,310,419	38,331	0	1,891	6,213	0	0	6,356,854	187,465,580	194,146,365	
1968	15,736,691	57,595,765	2,707,580	30,784	0	1,324	4,369	0	0	2,744,057	192,593,079	197,978,911	
1969	16,228,175	34,690,908	423,797	26,549	0	907	2,905	0	0	454,158	182,530,023	184,473,490	
1970	22,330,328	50,497,652	269,194	24,368	0	851	2,787	0	0	297,200	206,720,774	207,082,650	
1971	16,890,503	40,115,145	164,446	32,230	0	1,315	3,804	0	0	201,795	158,414,033	158,624,739	
1972	3,818,001	2,874,264	131,332	17,601	0	522	1,660	0	0	151,115	68,228,670	68,362,291	
1973	13,426,222	25,999,878	182,493	16,154	0	542	1,758	0	0	200,947	45,110,823	45,263,853	
1974	2,988,318	4,334,592	190,866	18,799	0	463	1,405	0	0	211,533	24,036,199	24,402,166	
1975	1,808,235	4,782,778	64,582	36,012	0	2,255	6,656	0	0	109,505	21,065,768	21,318,838	
1976	1,253,067	4,931,230	198,266	68,898	0	5,088	14,988	0	0	287,240	17,183,961	17,492,910	
1977	345,023	7,238,418	918,473	81,305	0	1,834	5,387	0	0	1,006,999	15,165,801	15,544,382	
1978	763,445	11,312,134	52,994	83,300	0	1,302	3,852	0	0	141,448	18,661,117	19,119,151	
1979	282,145	24,133,453	38,182	108,951	0	1,505	4,433	0	0	153,071	31,202,118	31,857,362	
1980	2,055,206	32,733,044	189,070	376,036	0	1,152	3,449	0	0	569,707	73,891,101	74,986,833	
1981	275,460	22,193,909	19,897	(157,537)	0	1,427	4,261	0	0	(131,952)	15,246,649	15,742,773	
1982	351,376	18,460,292	(16,381)	(96,449)	0	588	1,787	0	0	(110,455)	38,256,580	39,705,931	
1983	566,545	7,843,883	85,496	67,106	0	794	2,398	0	0	155,794	34,705,281	38,044,649	
1984	1,118,954	4,483,129	28,568	54,074	0	986	2,959	0	0	86,587	20,454,091	30,382,250	
1985	284,243	2,702,880	36,834	54,314	0	2,111	6,263	0	0	99,522	14,914,930	28,537,556	
1986	213,353	862,264	82,358	223,134	0	17,458	51,279	0	0	374,229	13,435,351	14,155,828	
1987	158,313	1,558,413	53,817	1,061,939	0	92,506	272,968	0	0	1,481,230	11,711,428	34,331,982	
1988	222,068	2,727,641	183,853	1,141,272	0	99,456	293,612	0	0	1,718,193	11,026,370	18,123,243	
1989	148,674	1,709,872	84,678	893,765	0	77,283	228,038	0	0	1,283,764	30,302,112	33,130,497	
1990	119,438	1,926,708	133,868	1,100,167	0	103,785	277,889	0	0	1,615,709	32,589,619	34,435,721	
1991	229,315	2,434,054	164,610	1,635,283	0	123,603	363,889	0	0	2,287,385	38,320,942	39,811,664	
1992	206,495	5,956,960	183,240	1,220,510	1,495,646	566,230	240,553	102,051	74,162	3,882,392	34,312,996	35,041,233	
1993	296,349	5,160,362	344,928	5,274,657	5,052,431	1,345,211	688,935	268,937	358,367	13,333,466	53,122,384	53,921,787	
1994	168,426	1,306,242	282,150	15,905,886	21,341,196	8,915,445	2,363,238	678,753	1,315,559	50,802,227	73,751,564	74,225,377	
1995	304,983	2,080,904	1,196,326	45,172,271	62,947,362	23,975,738	20,849,939	7,029,108	7,117,197	168,287,941	191,033,090	191,525,571	
1996	98,522	1,056,598	948,730	42,987,442	54,300,990	26,475,298	18,790,572	7,213,823	6,616,310	157,333,165	187,776,347	188,025,325	
1997	233,956	1,362,483	562,583	11,209,633	13,893,576	10,456,863	4,149,105	545,378	798,606	41,615,744	62,137,369	62,583,537	
1998	67,874	2,696,157	248,671	2,355,322	4,159,441	3,368,320	952,615	192,567	280,779	11,557,715	27,083,446	27,217,157	
1999	118,013	1,709,442	288,236	2,906,010	4,398,935	2,616,574	356,318	36,680	51,648	10,654,402	24,085,343	24,556,053	
2000	187,926	802,352	132,435	228,901	2,965,936	2,746,120	17,830	0	0	6,091,222	13,504,773	13,742,557	
2001	23,847	299,290	103,281	(7,057)	568,968	3,960	(1,112)	0	0	668,039	5,130,617	7,470,504	
2002	62,684	585,581	98,021	147,827	105,972	77,266	13,119	0	0	442,204	8,836,704	17,138,613	
2003	34,282	305,814	42,075	43,753	31,706	25,734	6,272	0	0	149,540	3,105,115	10,869,934	
2004	16,535	422,421	26,667	13,644	21,479	3,142	1,942	0	0	66,873	5,117,635	10,222,860	
2005	594,136	993,800	29,337	(261,476)	38,618	526	327	0	0	(192,669)	8,116,634	10,591,742	
2006	164,739	3,245,429	7,046	6,303	37,583	4	18,012	0	0	68,949	15,614,237	19,711,251	
2007	31,047	2,392,192	37,460	32,702	42,774	0	152	0	0	113,088	13,325,242	19,796,704	
2008	60,186	3,272,409	41,227	34,997	10,865	24	14,163	0	0	101,277	14,431,277	28,238,392	
2009	47,211	3,483,543	19,458	17,409	2,357	43	44,176	0	0	83,443	26,147,625	39,761,679	
2010	17,025	1,140,128	633,621	3,158	0	(1)	(1,210)	0	0	635,568	22,985,711	45,037,723	
2011	2,023	471,619	848,388	611	0	4	4,284	0	0	853,287	17,010,576	35,805,364	
2012	54,204	839,043	189,791	148,443	0	96	1,455	0	0	339,786	20,598,756	32,166,127	
2013	90,195	1,037,664	3,248,937	1,369,495	0	4,602	0	0	0	4,623,034	47,139,317	51,951,997	
2014	91,050	527,893	608,033	354,127	0	81	0	0	0	962,241	58,121,267	59,314,873	
2015	48,358	1,250,154	266,957	233,044	0	0	0	0	0	500,001	63,932,412	64,831,290	
2016	0	1,436,232	26,162	22,838	0	0	0	0	0	49,000	33,241,210	33,290,210	
2017	0	0	0	0	0	0	0	0	0	0	6,881,028	6,881,028	
2018	0	0	0	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	137,532,563	489,830,711	26,541,251	136,615,371	171,415,834	81,146,622	50,129,221	16,067,297	16,612,628	498,528,223	2,795,762,109	3,068,230,270	

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 1 of 9

Calendar Year	UPPER FEATHER DIVISION	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT			
		Reach 1	Reach 2	Reach 3A	Reach 3B	Total	Reach 1	Reach 2	Reach 4	Reach 5
		[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	37,396	5,522	0	0
1963	0	0	0	0	0	0	147,719	20,639	0	0
1964	0	0	0	0	0	0	149,750	15,574	19,405	0
1965	0	0	0	0	0	0	259,939	45,718	46,485	0
1966	0	0	0	0	0	0	270,890	23,799	63,921	0
1967	0	0	0	0	0	0	438,050	32,798	108,127	0
1968	0	0	0	0	130	130	410,919	44,277	66,973	706
1969	0	0	0	0	80,875	80,875	487,377	48,339	75,644	706
1970	0	0	0	0	94,872	94,872	381,734	44,852	64,833	71,376
1971	54	0	0	0	45,579	45,579	357,850	25,666	50,344	38,735
1972	40	0	0	0	37,895	37,895	347,941	30,606	56,800	100,106
1973	1	0	0	0	32,993	32,993	386,897	36,172	58,288	28,810
1974	143	0	0	0	46,498	46,498	456,381	57,081	83,120	61,623
1975	1,069	0	0	0	37,707	37,707	624,989	46,111	81,361	36,682
1976	139	0	0	0	60,786	60,786	614,362	47,862	123,838	91,096
1977	892	0	0	0	78,400	78,400	511,065	48,926	104,280	102,083
1978	39	0	0	0	56,318	56,318	671,195	125,224	176,855	50,289
1979	3,235	0	0	0	73,852	73,852	650,826	76,849	212,826	91,380
1980	416	0	0	0	81,769	81,769	1,128,840	212,974	242,118	110,786
1981	3,847	0	0	0	101,340	101,340	884,763	130,126	167,118	204,772
1982	11,075	0	0	0	191,987	191,987	1,156,605	141,718	249,447	96,020
1983	1,928	0	0	0	80,215	80,215	1,258,144	84,360	373,875	152,255
1984	3,765	0	0	0	139,121	139,121	1,998,984	113,797	340,344	34,461
1985	2,888	0	0	0	259,515	259,515	2,044,121	207,478	427,930	247,308
1986	2,787	0	0	0	229,508	229,508	1,834,838	285,908	305,149	159,054
1987	2,388	0	0	0	310,683	310,683	2,118,974	163,714	400,547	283,067
1988	545	0	(94)	0	330,156	330,062	2,068,655	186,275	299,934	370,212
1989	1,800	473,408	178,069	237,480	373,427	1,262,384	2,164,688	163,481	320,734	497,038
1990	788	556,610	244,897	123,144	427,257	1,351,908	2,233,036	251,434	355,022	571,415
1991	3,654	651,307	302,327	205,516	428,470	1,587,620	1,806,699	152,509	95,745	93,986
1992	647	443,912	189,330	265,462	280,505	1,179,209	2,064,907	405,932	409,435	363,964
1993	3,630	435,240	294,416	213,267	289,206	1,232,129	3,925,050	621,712	480,832	399,558
1994	2,279	430,112	198,322	206,594	365,646	1,200,674	4,673,275	302,115	404,709	408,066
1995	2,906	428,313	282,898	151,703	295,326	1,158,240	3,849,620	316,905	566,447	330,706
1996	8,007	796,526	272,743	240,106	260,001	1,569,376	3,526,989	254,075	664,485	493,300
1997	7,449	504,476	210,763	213,211	315,374	1,243,824	3,010,809	189,269	591,540	230,371
1998	798	404,834	227,562	204,821	251,154	1,088,371	2,965,219	426,871	532,042	303,263
1999	416	680,206	333,478	298,434	290,508	1,602,626	3,760,568	480,519	439,758	468,562
2000	505	924,000	256,929	658,777	415,502	2,255,207	3,835,977	545,039	445,324	565,475
2001	319	1,072,900	232,701	455,912	181,531	1,943,043	2,909,752	272,870	290,308	391,018
2002	3,627	1,587,083	416,416	411,471	399,018	2,813,988	3,858,106	342,137	467,256	539,273
2003	3,393	1,783,857	551,099	572,442	357,563	3,264,960	2,389,867	371,064	585,185	973,289
2004	3,455	1,610,031	640,791	743,771	822,223	3,816,816	3,390,359	516,670	758,452	710,717
2005	3,452	1,063,514	325,460	769,091	413,961	2,572,025	3,331,412	265,370	432,215	814,222
2006	3,867	816,404	259,760	599,513	440,819	2,116,496	3,454,003	377,612	749,500	604,256
2007	3,168	1,127,576	313,199	474,515	289,241	2,204,531	4,908,435	673,321	581,368	783,012
2008	3,724	890,335	272,963	525,140	626,796	2,315,234	5,104,535	668,840	726,995	920,873
2009	88	1,268,275	319,957	609,239	568,863	2,766,334	3,824,518	655,565	666,770	1,347,560
2010	25	2,697,529	172,139	1,108,061	300,045	4,277,775	4,269,211	570,213	769,229	704,010
2011	63	2,636,893	643,648	1,216,086	446,004	4,942,631	4,887,817	799,890	826,213	496,205
2012	29	2,424,646	209,689	1,432,834	1,154,146	5,221,314	5,143,722	1,076,787	701,301	822,523
2013	41	2,747,610	349,420	1,191,346	521,862	4,810,238	5,357,735	896,882	820,624	348,120
2014	42	2,847,926	356,827	1,386,966	530,400	5,122,119	5,183,478	897,263	834,672	474,939
2015	43	2,832,486	363,919	1,329,261	537,245	5,062,911	5,234,409	902,807	846,455	482,686
2016	42	2,837,434	360,289	1,315,549	535,133	5,048,405	5,311,126	904,608	842,256	439,600
2017	43	2,865,809	363,892	1,328,705	540,485	5,098,891	5,364,238	913,654	850,679	443,996
2018	43	2,894,467	367,531	1,341,992	545,890	5,149,880	5,417,880	922,790	859,186	448,436
2019	44	2,923,412	371,206	1,355,412	551,348	5,201,378	5,472,059	932,018	867,777	452,921
2020	44	2,952,646	374,918	1,368,966	556,862	5,253,392	5,526,779	941,338	876,455	457,450
2021	45	2,982,172	378,668	1,382,655	562,431	5,305,926	5,582,047	950,752	885,220	462,025
2022	45	3,011,994	382,454	1,396,482	568,055	5,358,985	5,637,868	960,259	894,072	466,645
2023	45	3,042,114	386,279	1,410,447	573,735	5,412,575	5,694,246	969,862	903,013	471,311
2024	46	3,072,535	390,142	1,424,551	579,473	5,466,701	5,751,189	979,560	912,043	476,024
2025	46	3,103,260	394,043	1,438,797	585,267	5,521,367	5,808,701	989,356	921,163	480,785
2026	47	3,134,293	397,983	1,453,185	591,120	5,576,581	5,866,788	999,249	930,375	485,592
2027	47	3,165,636	401,963	1,467,717	597,031	5,632,347	5,925,456	1,009,242	939,679	490,448
2028	48	3,197,292	405,983	1,482,394	603,002	5,688,671	5,984,710	1,019,334	949,075	495,353
2029	48	3,229,265	410,043	1,497,218	609,032	5,745,558	6,044,557	1,029,528	958,566	500,306
2030	49	3,261,558	414,143	1,512,190	615,122	5,803,013	6,105,003	1,039,823	968,152	505,309
2031	49	3,294,173	418,285	1,527,312	621,273	5,861,043	6,166,053	1,050,221	977,833	510,363
2032	50	3,327,115	422,467	1,542,585	627,486	5,919,653	6,227,713	1,060,723	987,612	515,466
2033	50	3,360,386	426,692	1,558,011	633,761	5,978,850	6,289,991	1,071,331	997,488	520,621
2034	51	3,393,990	430,959	1,573,591	640,098	6,038,638	6,352,890	1,082,044	1,007,463	525,827
2035	51	3,427,930	435,269	1,589,327	646,499	6,099,025	6,416,419	1,092,864	1,017,537	531,085
<b>TOTAL</b>	<b>94,398</b>	<b>96,613,489</b>	<b>16,352,837</b>	<b>44,811,249</b>	<b>25,735,393</b>	<b>183,512,968</b>	<b>239,709,112</b>	<b>35,608,074</b>	<b>38,107,821</b>	<b>27,149,496</b>

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 2 of 9

Calendar Year	SOUTH BAY AQUEDUCT (continued)					CALIFORNIA AQUEDUCT			
						NORTH SAN JOAQUIN DIVISION			
	Reach 6	Reach 7	Reach 8	Reach 9	Total	Reach 1	Reach 2A	Reach 2B	Subtotal
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	42,918	0	0	0	0
1963	0	0	0	0	168,358	0	0	0	0
1964	0	0	0	0	184,729	0	0	0	0
1965	2,634	6,490	4,704	12,904	378,874	0	0	0	0
1966	4,707	10,328	9,233	25,519	408,397	0	0	0	0
1967	2,712	7,659	10,812	34,347	634,505	0	0	0	0
1968	3,109	7,960	10,166	40,372	584,482	1,001,998	228,359	103,116	1,333,473
1969	3,944	5,975	8,795	38,566	669,346	933,116	301,596	188,194	1,422,906
1970	2,464	(1,991)	6,870	28,210	598,348	971,602	306,198	151,539	1,429,339
1971	3,116	9,394	9,895	31,068	526,068	1,103,021	254,786	113,694	1,471,501
1972	5,125	10,247	12,054	44,699	607,578	1,107,855	230,906	110,109	1,448,870
1973	4,178	7,500	4,890	43,816	570,551	1,150,864	221,445	100,221	1,472,530
1974	7,812	7,564	5,523	48,054	727,158	1,272,034	231,383	117,156	1,620,573
1975	18,120	14,683	18,325	68,377	908,648	1,434,736	455,110	201,075	2,090,921
1976	10,873	5,557	19,920	49,921	963,429	1,519,801	217,348	453,400	2,190,549
1977	(240)	2,228	8,391	89,579	866,312	1,913,643	292,380	196,564	2,402,587
1978	(1,404)	16,766	(5,313)	104,078	1,137,690	1,860,456	306,503	188,214	2,355,173
1979	1,269	29,294	7,351	106,835	1,176,630	1,848,109	231,339	145,205	2,224,653
1980	3,621	24,270	17,404	110,852	1,850,865	2,365,292	472,660	247,608	3,085,560
1981	4,038	20,109	17,586	98,143	1,526,655	2,649,730	435,226	154,191	3,239,147
1982	2,236	22,870	21,919	202,590	1,893,405	3,192,710	599,793	244,664	4,037,167
1983	(2,047)	48,781	45,573	216,434	2,177,375	4,244,937	802,908	273,081	5,320,926
1984	4,449	44,017	23,563	455,054	3,014,669	4,373,157	808,917	290,728	5,472,802
1985	13,097	74,565	57,920	238,067	3,310,486	4,717,323	629,825	189,199	5,536,347
1986	11,614	31,084	46,864	363,350	3,037,861	5,217,491	929,919	359,365	6,506,775
1987	15,273	25,182	37,949	416,375	3,461,081	5,292,200	958,927	362,065	6,613,192
1988	30,207	41,047	49,156	335,408	3,380,894	5,329,317	822,300	360,336	6,511,953
1989	9,740	54,881	114,203	179,323	3,504,088	5,753,966	851,745	907,609	7,513,320
1990	31,161	69,416	119,309	247,781	3,878,574	6,788,986	1,066,314	883,822	8,739,122
1991	22,434	(18,690)	99,577	262,052	2,514,312	6,796,247	1,067,078	585,008	8,448,333
1992	26,787	332,012	98,670	186,640	3,888,347	9,415,121	1,419,603	673,833	11,508,557
1993	24,845	181,592	94,169	316,045	6,043,803	10,274,070	1,371,074	900,996	12,546,140
1994	28,383	90,791	80,942	416,061	6,404,342	8,451,199	1,325,511	802,217	10,578,927
1995	29,298	64,012	80,278	373,657	5,610,923	10,406,784	2,386,507	959,685	13,752,976
1996	(1,020)	60,610	11,672	312,097	5,322,208	10,246,985	2,604,651	628,177	13,479,813
1997	18,428	95,321	15,691	335,566	4,486,995	10,429,338	1,098,381	2,084,859	13,612,578
1998	26,323	54,255	611,290	658,090	5,577,354	11,409,135	1,449,411	5,364,368	18,222,914
1999	50,754	36,944	431,026	2,037,263	7,705,395	11,643,735	1,450,708	1,344,328	14,438,771
2000	135,855	88,416	187,111	643,299	6,446,496	12,693,048	889,201	648,294	14,230,543
2001	112,969	188,968	197,744	1,048,176	5,411,806	17,559,672	1,378,814	753,770	19,692,256
2002	143,906	171,249	500,977	2,780,544	8,803,446	14,409,553	862,631	620,163	15,892,347
2003	80,247	99,526	249,003	991,378	5,739,558	16,698,652	1,768,842	769,990	19,237,483
2004	159,263	181,127	206,706	458,743	6,382,038	14,104,813	1,242,260	698,961	16,046,033
2005	143,913	203,035	136,107	225,974	5,552,250	12,529,335	1,952,869	881,964	15,364,168
2006	143,584	123,946	80,305	390,488	5,923,692	13,920,360	1,942,173	1,274,832	17,137,365
2007	81,797	120,159	75,434	258,580	7,482,106	12,134,608	1,747,468	658,066	14,540,141
2008	170,851	162,100	240,813	258,929	8,253,935	16,021,088	1,494,680	834,045	18,349,814
2009	84,163	145,027	120,558	631,042	7,475,202	13,805,308	1,103,030	877,550	15,785,889
2010	51,307	566,598	33,843	481,809	7,446,219	13,274,342	2,215,056	1,487,143	16,976,541
2011	82,627	84,424	69,376	494,524	7,741,076	16,588,503	2,907,667	1,482,935	20,979,106
2012	53,815	137,948	69,678	2,489,644	10,495,417	15,201,438	1,453,698	1,375,595	18,030,731
2013	63,905	284,247	58,970	826,671	8,647,154	17,375,280	2,134,345	2,760,989	22,270,614
2014	<b>64,962</b>	<b>289,738</b>	<b>59,865</b>	<b>804,469</b>	<b>8,609,386</b>	<b>20,788,297</b>	<b>1,798,519</b>	<b>1,746,977</b>	<b>24,333,793</b>
2015	65,817	294,711	60,535	798,190	8,685,610	17,382,658	1,821,360	1,411,967	20,615,985
2016	65,543	292,461	60,388	817,875	8,733,857	18,700,566	1,937,255	1,993,044	22,630,865
2017	66,198	295,385	60,992	826,054	8,821,196	18,887,572	1,956,627	2,012,975	22,857,174
2018	66,860	298,339	61,602	834,314	8,909,407	19,076,447	1,976,194	2,033,104	23,085,745
2019	67,529	301,323	62,218	842,657	8,998,502	19,267,212	1,995,955	2,053,435	23,316,602
2020	68,204	304,336	62,840	851,084	9,088,486	19,459,884	2,015,915	2,073,970	23,549,769
2021	68,886	307,379	63,468	859,595	9,179,372	19,654,483	2,036,074	2,094,709	23,785,266
2022	69,575	310,453	64,103	868,191	9,271,166	19,851,028	2,056,435	2,115,656	24,023,119
2023	70,271	313,557	64,744	876,872	9,363,876	20,049,538	2,076,999	2,136,813	24,263,350
2024	70,974	316,693	65,391	885,641	9,457,515	20,250,033	2,097,769	2,158,181	24,505,983
2025	71,683	319,860	66,045	894,498	9,552,091	20,452,534	2,118,747	2,179,763	24,751,044
2026	72,400	323,059	66,706	903,443	9,647,612	20,657,059	2,139,934	2,201,561	24,998,554
2027	73,124	326,289	67,373	912,477	9,744,088	20,863,630	2,161,334	2,223,576	25,248,540
2028	73,855	329,552	68,047	921,602	9,841,528	21,072,266	2,182,947	2,245,812	25,501,025
2029	74,594	332,848	68,727	930,818	9,939,944	21,282,989	2,204,777	2,268,270	25,756,036
2030	75,340	336,176	69,414	940,126	10,039,343	21,495,819	2,226,824	2,290,953	26,013,596
2031	76,093	339,538	70,108	949,527	10,139,736	21,710,777	2,249,093	2,313,862	26,273,732
2032	76,854	342,933	70,810	959,022	10,241,133	21,927,884	2,271,584	2,337,001	26,536,469
2033	77,623	346,362	71,518	968,613	10,343,547	22,147,163	2,294,299	2,360,371	26,801,833
2034	78,399	349,826	72,233	978,299	10,446,981	22,368,635	2,317,242	2,383,975	27,069,852
2035	79,183	353,324	72,955	988,082	10,551,449	22,592,321	2,340,415	2,407,814	27,340,550
TOTAL	3,500,209	11,073,637	5,883,082	40,118,442	401,149,873	811,369,754	95,197,843	81,852,710	988,420,308

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 3 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SAN LUIS DIVISION						SOUTH SAN JOAQUIN DIVISION		
	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7	Subtotal	Reach 8C	Reach 8D	Reach 9
[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	120,038	428,308	130,105	44,591	104,033	827,075	0	0	0
1969	90,033	460,907	184,467	35,696	235,322	1,006,425	22,013	134,760	86,103
1970	89,547	484,300	226,002	66,070	192,582	1,058,501	26,207	156,981	128,273
1971	99,917	541,574	175,592	64,193	158,170	1,039,446	32,312	190,753	118,372
1972	116,708	647,979	174,519	73,670	154,783	1,167,659	35,031	187,242	130,396
1973	116,791	611,705	158,145	58,344	153,955	1,098,940	51,150	225,747	127,530
1974	120,309	671,455	150,835	63,905	150,230	1,156,734	34,752	199,127	131,298
1975	133,593	839,285	178,974	81,478	157,586	1,390,916	78,523	250,377	159,006
1976	54,938	883,956	220,832	90,305	174,835	1,424,866	39,348	133,933	123,424
1977	73,331	1,114,465	270,734	98,132	196,311	1,752,973	38,086	121,348	178,078
1978	45,867	898,992	203,261	106,938	203,079	1,458,137	45,552	178,805	129,928
1979	223,973	842,508	144,055	99,670	180,734	1,490,940	69,973	150,679	129,756
1980	243,507	1,176,463	222,942	127,625	281,860	2,052,397	57,726	274,848	185,155
1981	265,766	1,065,358	193,048	90,533	1,612,157	3,226,862	80,121	198,256	144,187
1982	279,250	1,241,285	209,371	114,421	1,433,180	3,277,507	59,424	269,086	233,494
1983	214,468	1,949,017	339,809	131,377	2,143,678	4,778,349	49,448	383,476	223,078
1984	241,273	2,233,969	335,166	163,858	2,111,386	5,085,652	42,062	458,489	300,924
1985	322,068	2,882,583	360,431	176,577	1,603,532	5,345,191	58,820	495,500	213,368
1986	416,027	2,996,792	472,551	252,188	601,250	4,738,808	90,730	478,786	596,800
1987	362,738	3,104,592	424,107	236,349	439,232	4,567,018	113,962	412,042	446,067
1988	365,209	2,954,186	456,864	231,754	639,242	4,647,255	96,728	379,073	417,991
1989	263,171	3,182,472	393,589	332,986	633,419	4,805,637	83,282	389,698	400,853
1990	397,353	4,011,110	579,073	464,639	729,132	6,181,307	111,019	436,849	515,611
1991	256,473	4,388,184	543,760	728,156	765,765	6,682,338	104,414	496,794	465,940
1992	302,021	3,792,401	795,587	363,134	815,590	6,068,733	118,315	511,982	417,871
1993	439,725	4,337,616	1,008,394	551,849	734,796	7,072,380	230,338	745,885	490,159
1994	282,579	4,376,461	816,129	396,768	492,860	6,364,797	125,398	602,404	572,557
1995	107,995	5,026,076	1,066,971	440,006	1,356,668	7,997,716	185,681	657,282	432,072
1996	1,003,229	4,738,221	931,944	683,323	1,034,376	8,391,093	112,062	416,294	472,350
1997	859,665	5,761,996	924,289	254,934	646,209	8,447,093	128,190	449,316	728,436
1998	690,845	5,520,206	1,242,589	534,931	654,538	8,643,109	115,748	457,845	429,433
1999	606,554	5,825,181	1,227,696	544,839	685,070	8,889,340	108,267	428,344	443,434
2000	718,470	5,895,765	1,044,455	535,119	884,271	9,078,080	105,124	462,145	509,748
2001	(564,280)	7,152,186	851,973	373,028	679,853	8,492,760	58,435	553,319	603,170
2002	1,077,005	5,172,734	666,115	251,336	733,490	7,900,680	54,750	730,828	418,004
2003	1,053,811	6,142,402	764,734	315,556	633,421	8,909,925	63,209	687,532	662,411
2004	641,491	6,985,734	702,502	353,209	596,353	9,279,288	36,392	487,060	354,247
2005	552,069	5,978,934	984,769	401,831	799,558	8,717,161	29,047	408,760	303,730
2006	(53,818)	6,103,073	1,594,069	633,850	926,762	9,203,936	48,927	546,182	802,683
2007	1,117,086	7,605,738	1,977,312	689,681	971,854	12,361,682	240,280	864,850	543,132
2008	886,189	10,814,408	2,173,550	663,190	1,021,319	15,358,656	71,948	465,830	663,385
2009	960,191	8,083,079	1,234,659	507,805	1,185,721	11,971,455	37,180	773,985	486,426
2010	978,331	9,438,261	1,620,583	577,155	1,381,234	13,995,565	68,457	744,940	556,360
2011	1,085,853	7,117,932	2,678,037	570,277	1,622,452	13,074,552	14,480	621,201	805,361
2012	1,631,524	10,204,494	2,260,392	601,911	1,245,221	15,943,541	40,087	779,786	864,768
2013	2,798,560	9,592,687	2,233,694	1,140,784	2,531,113	18,296,838	45,179	815,785	842,894
2014	<b>1,806,830</b>	<b>9,695,260</b>	<b>4,149,534</b>	<b>945,018</b>	<b>1,832,903</b>	<b>18,429,545</b>	<b>75,647</b>	<b>941,102</b>	<b>942,265</b>
2015	1,790,922	9,787,522	4,753,909	938,655	1,839,363	19,110,371	120,701	1,058,202	984,293
2016	2,153,425	9,788,741	3,749,503	1,018,234	2,088,471	18,798,374	81,314	947,747	932,383
2017	2,174,959	9,886,629	3,786,998	1,028,416	2,109,356	18,986,358	82,127	957,224	941,706
2018	2,196,709	9,985,495	3,824,868	1,038,700	2,130,449	19,176,221	82,949	966,796	951,123
2019	2,218,676	10,085,350	3,863,116	1,049,087	2,151,754	19,367,983	83,778	976,464	960,635
2020	2,240,863	10,186,203	3,901,748	1,059,578	2,173,271	19,561,663	84,616	986,229	970,241
2021	2,263,271	10,288,065	3,940,765	1,070,174	2,195,004	19,757,279	85,462	996,091	979,943
2022	2,285,904	10,390,946	3,980,173	1,080,875	2,216,954	19,954,852	86,317	1,006,052	989,743
2023	2,308,763	10,494,856	4,019,974	1,091,684	2,239,124	20,154,401	87,180	1,016,113	999,640
2024	2,331,851	10,599,804	4,060,174	1,102,601	2,261,515	20,355,945	88,052	1,026,274	1,009,637
2025	2,355,169	10,705,802	4,100,776	1,113,627	2,284,130	20,559,504	88,932	1,036,537	1,019,733
2026	2,378,721	10,812,860	4,141,784	1,124,763	2,306,971	20,765,099	89,821	1,046,902	1,029,930
2027	2,402,508	10,920,989	4,183,202	1,136,011	2,330,041	20,972,751	90,720	1,057,371	1,040,230
2028	2,426,533	11,030,199	4,225,034	1,147,371	2,353,341	21,182,478	91,627	1,067,945	1,050,632
2029	2,450,799	11,140,501	4,267,284	1,158,845	2,376,875	21,394,304	92,543	1,078,624	1,061,138
2030	2,475,307	11,251,906	4,309,957	1,170,433	2,400,643	21,608,246	93,468	1,089,410	1,071,750
2031	2,500,060	11,364,425	4,353,056	1,182,138	2,424,650	21,824,329	94,403	1,100,304	1,082,467
2032	2,525,060	11,478,069	4,396,587	1,193,959	2,448,896	22,042,571	95,347	1,111,307	1,093,292
2033	2,550,311	11,592,850	4,440,553	1,205,898	2,473,385	22,262,997	96,301	1,122,421	1,104,225
2034	2,575,814	11,708,778	4,484,958	1,217,957	2,498,119	22,485,626	97,264	1,133,645	1,115,267
2035	2,601,572	11,825,866	4,529,808	1,230,137	2,523,100	22,710,483	98,236	1,144,981	1,126,420
TOTAL	73,101,481	420,098,147	127,012,437	39,622,130	86,346,497	746,180,692	5,444,982	42,681,946	40,444,958



**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 4 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN DIVISION (continued)									
	Reach 10A	Reach 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A	
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	
1961	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	
1969	83,706	59,077	0	0	0	0	0	0	0	
1970	118,046	85,758	94,171	123,374	152,424	0	0	0	0	
1971	129,811	80,282	95,075	91,389	167,142	691,791	151,979	111,623	529,723	
1972	117,625	84,287	98,647	115,592	146,096	877,535	124,831	101,479	609,058	
1973	117,706	92,257	74,238	114,843	221,385	961,855	120,106	99,429	692,748	
1974	141,658	98,103	74,914	193,523	141,540	898,272	143,866	115,649	853,098	
1975	207,908	124,105	61,799	117,194	108,154	1,156,757	180,614	119,889	988,045	
1976	139,134	69,715	33,655	147,908	134,063	1,124,051	177,086	114,133	1,037,799	
1977	194,086	108,644	91,547	175,039	137,975	1,397,006	203,837	119,467	1,339,196	
1978	168,634	106,702	72,585	170,578	151,120	1,254,043	139,662	132,224	1,265,813	
1979	175,107	85,942	56,331	174,147	150,029	1,490,461	201,935	260,981	1,216,126	
1980	284,207	120,896	123,120	167,249	164,749	1,988,619	189,132	238,607	1,437,614	
1981	199,927	76,965	33,322	113,202	171,669	1,741,488	163,934	161,182	1,799,832	
1982	264,947	158,178	142,631	224,170	224,051	1,793,867	195,086	15,768	1,933,859	
1983	308,801	136,350	124,724	203,733	217,324	2,421,794	199,708	181,879	2,550,842	
1984	396,448	163,331	108,212	188,724	245,764	3,312,127	329,490	204,332	3,215,901	
1985	298,337	198,368	154,995	194,327	360,308	3,463,178	237,127	180,068	3,427,049	
1986	422,493	248,170	242,660	346,410	349,369	3,781,427	320,984	360,156	3,574,451	
1987	488,226	334,059	325,697	469,378	322,824	3,731,912	463,757	238,813	4,080,465	
1988	532,489	290,881	220,658	374,653	318,253	3,451,893	411,110	313,806	3,746,920	
1989	733,030	268,025	207,487	595,433	380,883	3,512,884	333,996	220,978	3,751,081	
1990	651,465	363,652	225,171	480,738	677,729	4,021,727	439,953	212,851	4,381,643	
1991	716,328	328,683	269,873	371,312	433,313	4,309,082	424,704	273,169	4,566,702	
1992	574,145	334,579	270,768	409,314	423,717	4,734,368	729,211	571,412	4,270,793	
1993	723,450	413,722	278,375	496,851	594,201	5,182,830	664,063	423,780	5,266,124	
1994	703,493	346,600	239,873	482,301	445,909	4,012,614	414,899	254,393	3,727,019	
1995	881,902	405,045	242,253	622,654	507,102	4,607,154	309,283	315,905	3,973,757	
1996	984,784	367,570	238,622	519,560	604,736	4,892,967	214,773	187,784	4,331,630	
1997	1,864,113	309,696	254,080	516,115	429,771	5,094,202	421,221	275,610	4,011,366	
1998	1,011,284	295,927	170,556	384,226	484,072	4,752,549	309,440	248,178	4,694,822	
1999	1,164,599	396,923	196,320	425,633	546,106	5,125,184	345,662	223,518	4,912,931	
2000	920,546	405,115	323,874	650,161	565,156	6,004,150	361,345	153,389	5,371,234	
2001	870,769	415,492	895,380	521,186	660,395	4,702,503	(132,829)	(93,695)	6,004,876	
2002	1,309,338	380,972	296,995	959,902	861,795	5,951,342	32,538	251,678	5,601,627	
2003	827,703	344,147	238,353	705,532	626,023	6,249,912	(129,678)	21,981	7,102,971	
2004	615,288	250,322	178,822	641,809	600,590	7,343,321	(129,272)	(160,424)	9,047,773	
2005	903,216	214,036	120,086	856,072	627,912	6,279,171	(176,928)	(189,001)	4,928,134	
2006	497,935	204,832	66,401	773,527	523,638	5,175,453	(148,426)	(159,465)	8,355,399	
2007	637,035	274,749	303,866	560,678	565,536	6,656,623	(401,243)	(327,226)	10,849,929	
2008	943,941	438,816	248,159	428,879	733,441	11,114,716	(226,139)	(175,936)	12,926,869	
2009	932,501	425,040	227,866	623,976	566,310	7,771,331	555,963	(59,903)	8,825,174	
2010	725,405	464,952	130,453	427,181	715,201	7,809,455	(165,704)	(57,772)	6,688,200	
2011	1,166,520	638,473	331,434	891,946	1,590,758	8,792,662	(238,097)	(48,300)	6,295,126	
2012	874,277	848,543	340,665	1,100,428	3,276,713	11,569,761	411,090	463,347	9,153,031	
2013	1,028,227	738,713	325,757	907,849	1,479,307	11,350,480	626,619	462,185	7,039,439	
2014	<b>1,174,153</b>	<b>813,482</b>	<b>436,678</b>	<b>1,017,443</b>	<b>1,723,451</b>	<b>12,636,840</b>	<b>590,942</b>	<b>493,001</b>	<b>6,410,877</b>	
2015	1,300,111	821,583	581,353	1,045,547	1,926,650	10,418,556	776,318	464,790	5,968,661	
2016	1,179,172	799,172	452,408	1,000,183	1,726,901	11,583,311	671,273	478,058	6,537,722	
2017	1,190,964	807,163	456,932	1,010,185	1,744,170	11,699,144	677,986	482,839	6,603,099	
2018	1,202,873	815,235	461,502	1,020,286	1,761,612	11,816,136	684,766	487,667	6,669,130	
2019	1,214,902	823,387	466,117	1,030,489	1,779,228	11,934,297	691,614	492,544	6,735,821	
2020	1,227,051	831,621	470,778	1,040,794	1,797,020	12,053,640	698,530	497,469	6,803,180	
2021	1,239,322	839,937	475,486	1,051,202	1,814,990	12,174,177	705,515	502,444	6,871,211	
2022	1,251,715	848,337	480,241	1,061,714	1,833,140	12,295,918	712,570	507,468	6,939,924	
2023	1,264,232	856,820	485,043	1,072,331	1,851,472	12,418,877	719,696	512,543	7,009,323	
2024	1,276,874	865,388	489,893	1,083,055	1,869,986	12,543,066	726,893	517,669	7,079,416	
2025	1,289,643	874,042	494,792	1,093,885	1,888,686	12,668,497	734,162	522,845	7,150,210	
2026	1,302,539	882,783	499,740	1,104,824	1,907,573	12,795,182	741,503	528,074	7,221,712	
2027	1,315,565	891,610	504,738	1,115,872	1,926,649	12,923,134	748,918	533,354	7,293,929	
2028	1,328,720	900,527	509,785	1,127,031	1,945,915	13,052,365	756,408	538,688	7,366,869	
2029	1,342,008	909,532	514,883	1,138,301	1,965,374	13,182,889	763,972	544,075	7,440,537	
2030	1,355,428	918,627	520,032	1,149,684	1,985,028	13,314,718	771,611	549,516	7,514,943	
2031	1,368,982	927,813	525,232	1,161,181	2,004,878	13,447,865	779,327	555,011	7,590,092	
2032	1,382,672	937,092	530,484	1,172,793	2,024,927	13,582,343	787,121	560,561	7,665,993	
2033	1,396,499	946,462	535,789	1,184,521	2,045,177	13,718,167	794,992	566,167	7,742,653	
2034	1,410,464	955,927	541,147	1,196,366	2,065,628	13,855,349	802,942	571,828	7,820,080	
2035	1,424,568	965,486	546,559	1,208,330	2,086,285	13,993,902	810,971	577,546	7,898,280	
TOTAL	55,489,046	31,828,720	19,830,083	43,144,712	64,324,888	470,662,889	24,788,718	17,842,079	347,709,852	

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 5 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SOUTH SAN JOAQUIN DIVISION (continued)		TEHACHAPI DIVISION			MOJAVE DIVISION			
	Reach 16A	Subtotal	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 20A	Reach 20B
	[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	385,659	0	0	0	0	0	0	0
1970	0	885,234	0	0	0	0	0	0	0
1971	10,291	2,400,543	3,471	0	3,471	0	0	0	0
1972	1,106,884	3,734,703	1,424,782	28,127	1,452,909	36,699	135,675	130,711	120,271
1973	1,243,941	4,142,935	1,777,260	49,949	1,827,209	36,207	146,739	161,838	148,631
1974	1,343,972	4,369,772	2,298,091	16,259	2,314,350	30,525	90,404	115,571	88,200
1975	1,537,862	5,090,233	2,403,430	35,193	2,438,623	40,588	122,584	137,684	118,898
1976	1,727,428	5,001,677	2,776,194	126,653	2,902,847	118,610	201,215	292,927	151,555
1977	1,961,081	6,065,390	3,845,464	83,936	3,929,400	93,565	226,906	180,884	112,589
1978	1,922,950	5,738,596	2,954,313	42,637	2,996,950	91,815	200,759	215,673	120,584
1979	1,798,566	5,960,033	3,539,402	45,997	3,585,399	99,670	307,386	261,205	194,104
1980	2,231,456	7,463,378	4,749,245	54,806	4,804,051	116,487	446,175	290,719	237,250
1981	2,762,773	7,646,858	5,485,957	64,886	5,550,843	316,590	585,003	325,112	292,081
1982	2,961,383	8,475,944	6,349,080	55,997	6,405,077	447,739	638,615	275,763	330,502
1983	4,302,165	11,303,322	14,153,033	96,397	14,249,430	345,229	564,698	368,139	326,767
1984	5,077,824	14,043,628	18,448,383	77,201	18,525,584	267,497	563,588	413,443	329,933
1985	5,683,454	14,964,899	18,134,698	137,928	18,272,626	298,932	475,028	450,444	388,327
1986	5,780,666	16,593,102	19,297,129	109,938	19,407,067	703,413	350,906	347,690	315,566
1987	5,636,043	17,063,245	17,398,908	98,355	17,497,263	1,261,056	558,996	818,475	357,971
1988	5,150,238	15,704,693	17,697,838	138,405	17,836,243	1,242,139	560,911	585,014	400,005
1989	5,458,633	16,336,263	17,641,151	88,488	17,729,639	1,049,615	383,065	366,590	345,614
1990	6,440,643	18,959,051	19,995,760	99,868	20,095,628	1,298,537	229,083	469,502	202,412
1991	5,805,189	18,565,503	19,903,346	131,558	20,034,904	1,432,360	665,443	1,025,089	516,257
1992	6,471,964	19,838,439	18,194,788	279,610	18,474,398	1,167,898	738,238	666,181	696,623
1993	7,583,165	23,092,943	19,051,939	199,640	19,251,579	1,868,745	606,763	1,232,409	818,675
1994	7,142,378	19,069,838	17,354,702	204,963	17,559,665	1,699,479	763,493	1,145,700	957,350
1995	6,540,575	19,680,665	19,360,033	191,516	19,551,549	1,284,146	614,314	1,941,939	2,411,412
1996	7,065,052	20,408,184	19,041,451	237,846	19,279,297	1,163,708	576,674	1,335,804	1,713,145
1997	7,387,904	21,710,020	19,724,881	176,120	19,901,001	1,330,450	730,628	1,401,562	2,043,179
1998	7,530,927	20,885,007	23,227,152	182,754	23,409,906	1,513,656	309,052	7,568,901	508,030
1999	8,861,513	23,178,436	19,993,981	161,263	20,155,244	3,161,222	735,182	5,402,619	1,669,455
2000	12,510,197	28,342,184	23,354,261	244,032	23,598,294	1,877,111	704,367	1,356,539	1,698,216
2001	15,780,977	30,839,977	24,057,353	617,785	24,675,138	2,438,832	2,543,015	1,837,989	1,521,397
2002	11,469,741	28,319,511	20,749,651	472,725	21,222,376	1,406,393	802,084	758,769	585,111
2003	11,665,729	29,065,825	21,009,929	286,409	21,296,338	3,807,068	688,454	723,308	631,997
2004	14,831,045	34,096,973	26,803,612	249,698	27,053,309	1,910,337	1,386,867	1,336,967	1,052,461
2005	13,916,715	29,066,545	16,471,017	1,500,044	17,971,114	2,869,340	1,507,443	1,547,485	883,538
2006	13,810,904	30,497,992	14,975,584	311,220	15,286,804	4,480,237	1,329,743	1,216,863	2,935,392
2007	8,462,855	29,231,064	15,995,540	433,116	16,428,656	5,870,199	1,647,145	1,802,531	1,840,527
2008	10,946,272	38,580,180	23,375,279	405,311	23,780,591	2,312,980	1,392,481	1,276,106	849,242
2009	13,337,352	34,503,201	23,170,840	233,080	23,403,920	2,565,517	1,551,970	1,349,076	1,176,615
2010	9,577,784	27,684,912	14,415,926	367,921	14,783,847	3,429,462	1,646,756	2,639,377	1,770,541
2011	15,871,197	36,732,761	18,881,484	249,309	19,130,793	2,608,369	1,803,231	2,317,809	2,218,782
2012	13,747,138	43,469,634	21,517,152	326,680	21,843,832	5,065,483	1,328,884	1,496,150	2,583,871
2013	13,642,941	39,305,375	25,667,647	303,631	25,971,278	3,736,130	1,281,981	1,948,901	3,262,182
2014	<b>13,303,453</b>	<b>40,559,334</b>	<b>23,584,388</b>	<b>308,428</b>	<b>23,892,816</b>	<b>3,771,367</b>	<b>1,295,585</b>	<b>1,977,828</b>	<b>1,925,386</b>
2015	12,217,323	37,684,088	20,341,893	311,262	20,653,155	5,660,421	1,301,956	1,996,486	1,727,414
2016	13,185,118	39,574,762	23,429,956	310,851	23,740,807	4,433,199	1,306,106	1,994,149	2,328,044
2017	13,316,969	39,970,508	23,664,255	313,959	23,978,214	4,477,531	1,319,167	2,014,091	2,351,324
2018	13,450,139	40,370,214	23,900,898	317,099	24,217,997	4,522,306	1,332,358	2,034,231	2,374,838
2019	13,584,640	40,773,916	24,139,907	320,270	24,460,177	4,567,529	1,345,682	2,054,574	2,398,586
2020	13,720,486	41,181,655	24,381,306	323,473	24,704,779	4,613,205	1,359,139	2,075,119	2,422,572
2021	13,857,691	41,593,471	24,625,119	326,707	24,951,826	4,659,337	1,372,730	2,095,871	2,446,798
2022	13,996,268	42,009,407	24,871,370	329,974	25,201,344	4,705,930	1,386,458	2,116,829	2,471,266
2023	14,136,231	42,429,501	25,120,084	333,274	25,453,358	4,752,989	1,400,322	2,137,998	2,495,978
2024	14,277,593	42,853,796	25,371,285	336,607	25,707,892	4,800,519	1,414,325	2,159,378	2,520,938
2025	14,420,369	43,282,333	25,624,998	339,973	25,964,971	4,848,525	1,428,469	2,180,971	2,546,147
2026	14,564,573	43,715,156	25,881,248	343,373	26,224,621	4,897,010	1,442,753	2,202,781	2,571,609
2027	14,710,218	44,152,308	26,140,060	346,806	26,486,866	4,945,980	1,457,181	2,224,809	2,597,325
2028	14,857,321	44,593,833	26,401,461	350,274	26,751,735	4,995,440	1,471,753	2,247,057	2,623,298
2029	15,005,894	45,039,770	26,665,475	353,777	27,019,252	5,045,394	1,486,470	2,269,528	2,649,531
2030	15,155,953	45,490,168	26,932,130	357,315	27,289,445	5,095,848	1,501,335	2,292,223	2,676,026
2031	15,307,512	45,945,067	27,201,451	360,888	27,562,339	5,146,806	1,516,348	2,315,145	2,702,787
2032	15,460,587	46,404,519	27,473,466	364,497	27,837,963	5,198,275	1,531,512	2,338,297	2,729,815
2033	15,615,193	46,868,567	27,748,200	368,142	28,116,342	5,250,257	1,546,827	2,361,680	2,757,113
2034	15,771,345	47,337,252	28,025,682	371,823	28,397,505	5,302,760	1,562,295	2,385,296	2,784,684
2035	15,929,059	47,810,623	28,305,939	375,542	28,681,481	5,355,787	1,577,918	2,409,149	2,812,531
TOTAL	623,941,704	1,788,134,575	1,206,501,763	16,681,565	1,223,183,328	173,940,450	63,398,632	97,308,946	93,549,270

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 6 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	MOJAVE DIVISION (continued)						SANTA ANA DIVISION		
	Reach 21	Reach 22A	Reach 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	Reach 28G
[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	75,768	80,436	1,036,831	51,520	362,153	2,030,064	26	578	109
1973	60,641	66,539	1,283,816	65,475	353,262	2,323,148	20,541	679,328	136,352
1974	65,007	77,667	1,477,946	96,340	334,302	2,375,962	24,380	799,400	155,262
1975	135,462	77,825	1,630,554	111,141	419,450	2,794,186	29,337	885,021	110,729
1976	106,314	131,007	1,598,071	107,787	304,638	2,902,124	51,356	1,103,139	138,575
1977	98,575	86,279	1,882,080	71,228	48,359	2,800,647	62,584	1,412,740	127,543
1978	109,271	71,763	2,211,965	72,179	637,401	3,731,410	67,186	1,159,950	166,919
1979	203,078	121,586	2,104,832	76,900	202,566	3,571,387	84,462	1,235,189	142,586
1980	156,794	117,274	2,670,387	147,009	688,605	4,870,700	72,651	1,532,535	158,340
1981	181,062	119,602	3,030,407	134,895	47,750	5,032,502	35,662	1,575,444	160,053
1982	186,109	125,429	3,248,883	299,712	623,755	6,176,507	26,852	1,822,250	205,350
1983	219,943	140,523	3,899,769	223,626	384,292	6,472,986	19,017	1,663,599	244,720
1984	266,919	146,866	4,783,997	59,337	1,104,149	7,935,729	11,319	2,325,661	240,496
1985	799,514	125,780	5,330,501	261,135	811,346	8,941,007	17,764	2,707,662	451,600
1986	242,158	178,847	6,190,812	156,053	515,945	9,001,390	31,012	2,768,728	439,048
1987	298,190	236,263	5,731,239	151,796	732,607	10,146,593	19,362	2,847,390	278,094
1988	331,099	149,876	6,910,472	253,833	970,052	11,403,401	36,576	3,087,873	271,868
1989	194,047	138,825	5,963,386	349,544	1,242,144	9,932,830	30,881	3,190,809	230,953
1990	273,748	49,174	6,905,442	436,785	1,891,053	11,755,736	25,518	3,330,913	437,812
1991	478,555	231,223	7,488,366	263,723	1,561,051	13,662,067	32,172	3,847,589	843,388
1992	585,072	168,251	7,076,997	317,042	622,116	12,038,418	55,819	4,043,878	281,864
1993	509,309	207,818	7,765,751	359,632	1,708,915	15,078,017	72,464	5,638,325	382,195
1994	873,215	241,679	7,691,548	1,220,795	1,245,936	15,839,195	105,373	5,139,991	617,136
1995	355,198	179,930	6,994,639	842,041	746,371	15,369,990	96,781	4,357,648	1,308,828
1996	790,618	136,397	8,590,347	889,842	(78,782)	15,117,753	156,395	4,051,744	1,001,063
1997	640,177	189,241	8,138,580	1,586,227	3,355,446	19,415,490	177,217	4,585,198	493,841
1998	297,621	115,100	8,887,728	1,924,868	1,134,837	22,259,793	142,703	4,856,225	379,997
1999	1,397,331	188,734	9,546,515	2,035,924	1,230,967	25,367,950	190,409	6,055,156	505,937
2000	958,916	152,200	9,712,099	1,713,681	1,542,037	19,425,165	353,790	4,246,855	848,093
2001	1,068,249	474,051	7,702,562	1,893,242	33,525	19,512,862	298,329	2,445,693	1,668,195
2002	1,157,882	283,269	11,265,536	1,697,344	937,539	18,893,927	509,391	3,410,163	1,251,757
2003	482,423	289,505	13,524,464	2,134,205	(431,228)	21,850,196	371,352	3,844,968	558,498
2004	1,069,610	424,190	10,714,489	2,173,944	1,114,224	21,183,088	431,159	5,575,628	1,254,255
2005	682,834	356,280	7,683,479	2,428,022	2,253,045	20,211,465	453,656	5,654,386	1,524,316
2006	969,437	761,339	10,166,658	1,936,906	619,029	24,415,603	342,038	5,193,327	654,787
2007	841,683	669,691	10,052,237	3,003,678	718,361	26,444,052	312,481	8,072,228	860,269
2008	509,723	724,209	14,713,612	2,453,501	1,051,262	25,283,116	403,812	6,860,821	830,442
2009	779,729	550,187	12,267,301	3,508,121	1,554,090	25,302,605	587,433	7,171,822	653,099
2010	793,892	720,827	12,772,534	3,328,082	2,966,090	30,067,559	740,774	6,531,793	523,382
2011	635,426	598,963	13,440,571	4,140,301	3,376,336	31,139,789	548,524	5,546,169	885,953
2012	1,737,075	615,124	13,786,523	2,937,210	4,949,190	34,499,509	369,206	6,408,559	1,745,542
2013	819,909	539,903	17,479,488	3,802,866	2,450,836	35,322,196	591,396	7,880,016	1,178,968
2014	<b>673,173</b>	<b>2,534,063</b>	<b>17,068,966</b>	<b>3,841,209</b>	<b>1,658,918</b>	<b>34,746,495</b>	<b>603,085</b>	<b>9,759,259</b>	<b>1,187,703</b>
2015	669,450	542,912	15,316,935	3,840,013	1,689,466	32,745,053	612,561	7,916,493	1,182,013
2016	728,052	1,217,682	16,788,014	3,866,309	1,952,404	34,613,959	608,370	8,803,775	1,194,724
2017	735,333	1,229,859	16,955,894	3,904,972	1,971,928	34,960,099	614,454	8,689,813	1,206,671
2018	742,686	1,242,158	17,125,453	3,944,022	1,991,647	35,309,699	620,599	8,776,711	1,218,738
2019	750,113	1,254,579	17,296,708	3,983,462	2,011,564	35,662,797	626,805	8,864,478	1,230,925
2020	757,614	1,267,125	17,469,675	4,023,297	2,031,679	36,019,425	633,073	8,953,123	1,243,235
2021	765,190	1,279,796	17,644,371	4,063,530	2,051,996	36,379,619	639,403	9,042,654	1,255,667
2022	772,842	1,292,594	17,820,815	4,104,165	2,072,516	36,743,415	645,798	9,133,080	1,268,224
2023	780,571	1,305,520	17,999,023	4,145,207	2,093,241	37,110,849	652,255	9,224,411	1,280,906
2024	788,376	1,318,575	18,179,013	4,186,659	2,114,173	37,481,956	658,778	9,316,655	1,293,715
2025	796,260	1,331,761	18,360,804	4,228,526	2,135,315	37,856,778	665,366	9,409,822	1,306,652
2026	804,223	1,345,079	18,544,412	4,270,811	2,156,668	38,235,346	672,019	9,503,920	1,319,719
2027	812,265	1,358,530	18,729,856	4,313,519	2,178,235	38,617,700	678,740	9,598,959	1,332,916
2028	820,388	1,372,115	18,917,154	4,356,654	2,200,017	39,003,876	685,527	9,694,949	1,346,245
2029	828,592	1,385,836	19,106,326	4,400,221	2,222,018	39,393,916	692,382	9,791,898	1,359,707
2030	836,878	1,399,694	19,297,389	4,444,223	2,244,238	39,787,854	699,306	9,889,817	1,373,304
2031	845,246	1,413,691	19,490,363	4,488,665	2,266,680	40,185,731	706,299	9,988,716	1,387,037
2032	853,699	1,427,828	19,685,267	4,533,552	2,289,347	40,587,592	713,362	10,088,603	1,400,908
2033	862,236	1,442,106	19,882,119	4,578,887	2,312,240	40,993,465	720,496	10,189,489	1,414,917
2034	870,858	1,456,528	20,080,941	4,624,676	2,335,363	41,403,401	727,701	10,291,384	1,429,066
2035	879,567	1,471,093	20,281,750	4,670,923	2,358,716	41,817,434	734,978	10,394,297	1,443,357
TOTAL	39,811,375	40,948,795	707,394,663	142,531,052	92,671,391	1,451,554,573	22,620,518	362,468,697	53,024,562

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 7 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SANTA ANA DIVISION (continued)			SANTA ANA DIVISION - EAST BRANCH EXTENSION					
	Reach 28H	Reach 28J	Subtotal	Reach 1	Reach 2A	Reach 2B	Reach 2C	Reach 2D	Reach 3A
[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[64]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	30	0	743	0	0	0	0	0	0
1973	79	0	836,300	0	0	0	0	0	0
1974	34,693	854,637	1,868,372	0	0	0	0	0	0
1975	69,082	723,814	1,817,983	0	0	0	0	0	0
1976	100,400	635,853	2,029,323	0	0	0	0	0	0
1977	92,647	825,880	2,521,394	0	0	0	0	0	0
1978	68,363	835,082	2,297,500	0	0	0	0	0	0
1979	92,812	265,525	1,820,574	0	0	0	0	0	0
1980	129,897	1,120,131	3,013,554	0	0	0	0	0	0
1981	111,722	333,550	2,216,431	0	0	0	0	0	0
1982	135,463	1,518,759	3,708,674	0	0	0	0	0	0
1983	124,651	412,806	2,464,793	0	0	0	0	0	0
1984	190,924	769,068	3,537,468	0	0	0	0	0	0
1985	182,242	871,492	4,230,760	0	0	0	0	0	0
1986	256,526	982,332	4,477,646	0	0	0	0	0	0
1987	218,717	1,118,529	4,482,092	0	0	0	0	0	0
1988	200,811	1,176,659	4,773,787	0	0	0	0	0	0
1989	281,861	1,130,035	4,864,539	0	0	0	0	0	0
1990	308,144	1,538,449	5,640,836	0	0	0	0	0	0
1991	632,912	1,630,321	6,986,382	0	0	0	0	0	0
1992	5,636,464	1,102,519	11,120,544	0	0	0	0	0	0
1993	570,563	994,721	7,658,268	0	0	0	0	0	0
1994	415,603	1,022,412	7,300,515	0	0	0	0	0	0
1995	704,154	894,338	7,361,749	0	0	0	0	0	0
1996	1,041,697	1,316,493	7,567,392	0	0	0	0	0	0
1997	949,188	953,590	7,159,034	0	0	0	0	0	0
1998	991,426	(67,444)	6,302,907	0	0	0	0	0	0
1999	1,972,630	1,091,945	9,816,076	0	0	0	0	0	0
2000	1,006,982	1,124,978	7,580,699	0	0	0	0	0	0
2001	811,163	5,653,975	10,877,356	0	0	0	0	0	0
2002	423,326	2,245,240	7,839,877	0	0	0	0	0	0
2003	381,499	1,366,976	6,523,294	1,022	84,351	375,153	2,329	0	627,038
2004	447,022	3,672,448	11,380,513	10,740	40,841	509,089	2,340	0	276,019
2005	686,731	(1,870,558)	6,448,531	9,849	15,079	526,273	4,153	0	496,547
2006	339,521	5,229,263	11,758,936	9,948	10,190	532,526	9,248	44,735	394,360
2007	729,211	3,316,107	13,290,296	28,887	9,813	640,746	5,038	100,297	603,808
2008	808,863	4,631,994	13,335,932	75,265	34,251	813,861	1,295	173,891	1,278,949
2009	693,152	2,755,797	11,861,302	77,515	17,655	962,621	890	179,918	951,965
2010	470,515	3,613,880	11,880,343	52,208	3,603	776,416	15,510	210,068	1,185,380
2011	608,263	4,852,424	12,441,333	20,747	5,360	672,199	4,298	89,979	987,100
2012	594,604	4,067,260	13,185,170	4,019	10,016	575,657	9,749	134,010	1,258,940
2013	603,259	942,314	11,195,953	26,014	5,637	702,468	10,354	152,812	1,205,331
2014	<b>611,587</b>	<b>936,498</b>	<b>13,098,132</b>	<b>26,647</b>	<b>5,775</b>	<b>718,997</b>	<b>10,607</b>	<b>156,533</b>	<b>1,229,714</b>
2015	615,187	973,341	11,299,595	27,297	5,915	735,676	10,865	160,347	1,252,434
2016	616,111	960,225	11,983,205	26,920	5,834	726,237	10,715	158,130	1,241,452
2017	622,272	969,827	12,103,037	27,189	5,892	733,500	10,822	159,711	1,253,866
2018	628,495	979,526	12,224,069	27,461	5,951	740,835	10,930	161,308	1,266,405
2019	634,780	989,321	12,346,309	27,735	6,011	748,243	11,040	162,921	1,279,069
2020	641,128	999,214	12,469,773	28,013	6,071	755,726	11,150	164,550	1,291,860
2021	647,539	1,009,206	12,594,469	28,293	6,131	763,283	11,262	166,196	1,304,778
2022	654,014	1,019,298	12,720,414	28,576	6,193	770,916	11,374	167,858	1,317,826
2023	660,555	1,029,491	12,847,618	28,861	6,255	778,625	11,488	169,536	1,331,004
2024	667,160	1,039,786	12,976,094	29,150	6,317	786,411	11,603	171,232	1,344,314
2025	673,832	1,050,184	13,105,856	29,441	6,380	794,275	11,719	172,944	1,357,757
2026	680,570	1,060,686	13,236,914	29,736	6,444	802,218	11,836	174,673	1,371,335
2027	687,376	1,071,293	13,369,284	30,033	6,509	810,240	11,954	176,420	1,385,048
2028	694,249	1,082,006	13,502,976	30,334	6,574	818,343	12,074	178,184	1,398,899
2029	701,192	1,092,826	13,638,005	30,637	6,639	826,526	12,195	179,966	1,412,888
2030	708,204	1,103,754	13,774,385	30,943	6,706	834,791	12,317	181,766	1,427,017
2031	715,286	1,114,792	13,912,130	31,253	6,773	843,139	12,440	183,584	1,441,287
2032	722,439	1,125,940	14,051,252	31,565	6,841	851,571	12,564	185,419	1,455,700
2033	729,663	1,137,199	14,191,764	31,881	6,909	860,086	12,690	187,274	1,470,257
2034	736,960	1,148,571	14,333,682	32,200	6,978	868,687	12,817	189,146	1,484,959
2035	744,329	1,160,057	14,477,018	32,522	7,048	877,374	12,945	191,038	1,499,809
TOTAL	38,910,740	88,706,635	565,731,152	962,901	376,941	24,532,708	322,611	4,884,447	39,081,115

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 8 of 9

Calendar	CALIFORNIA AQUEDUCT (continued)											
	SANTA ANA DIVISION - EAST BRANCH EXTENSION (cont)				WEST BRANCH							
	Reach 3B	Reach 4A	Reach 4B	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	Reach 30	Subtotal	
Year	[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]	[75]	
1961	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	0	0	
1972	0	0	0	0	719,255	159,249	199,145	234,196	88,198	420,789	1,820,832	
1973	0	0	0	0	779,949	339,363	122,664	264,850	119,743	621,431	2,248,000	
1974	0	0	0	0	883,312	158,366	112,458	350,160	(4,525)	723,949	2,223,720	
1975	0	0	0	0	1,049,990	176,676	194,724	801,457	75,870	841,991	3,140,708	
1976	0	0	0	0	1,220,429	215,588	202,591	624,614	98,268	(650,944)	1,710,546	
1977	0	0	0	0	1,268,813	116,939	218,129	684,679	184	634,581	2,923,325	
1978	0	0	0	0	1,174,708	342,479	267,308	415,641	17,764	3,088,954	5,306,854	
1979	0	0	0	0	1,366,942	285,575	284,188	972,584	29,850	958,068	3,897,207	
1980	0	0	0	0	1,698,215	224,472	455,619	874,259	288,303	222,549	3,763,417	
1981	0	0	0	0	1,783,405	123,264	615,047	2,305,110	8,794	1,093,897	5,929,517	
1982	0	0	0	0	1,919,979	190,500	702,265	2,208,264	414,230	978,624	6,413,862	
1983	0	0	0	0	2,739,814	149,333	888,475	745,939	579,882	3,698,681	8,802,124	
1984	0	0	0	0	3,463,038	81,260	2,358,495	537,207	719,282	755,136	7,914,418	
1985	0	0	0	0	3,866,946	295,836	3,047,591	975,729	614,735	1,753,355	10,554,192	
1986	0	0	0	0	3,791,427	457,604	2,893,171	1,480,015	1,032,216	1,338,657	10,993,090	
1987	0	0	0	0	3,423,494	213,106	2,933,342	944,604	459,398	1,406,519	9,380,463	
1988	0	0	0	0	3,447,403	255,113	3,017,463	883,714	446,468	1,452,589	9,502,750	
1989	0	0	0	0	4,025,641	405,583	2,738,143	1,398,165	865,738	1,505,029	10,938,299	
1990	0	0	0	0	4,088,481	383,655	3,232,445	3,153,869	777,713	847,500	12,483,663	
1991	0	0	0	0	3,862,056	304,143	3,550,063	639,527	763,037	1,191,090	10,309,916	
1992	0	0	0	0	4,286,050	327,802	3,892,480	1,014,551	872,953	2,259,032	12,652,868	
1993	0	0	0	0	3,969,075	343,304	4,515,385	1,670,952	852,208	1,157,876	12,508,800	
1994	0	0	0	0	3,649,861	293,376	3,359,381	1,879,417	872,624	1,674,576	11,729,235	
1995	0	0	0	0	4,137,046	883,315	4,750,275	1,588,080	754,904	(421,879)	11,691,741	
1996	0	0	0	0	4,511,858	966,044	3,593,671	4,208,195	877,111	1,574,098	15,730,977	
1997	0	0	0	0	4,543,506	1,030,809	2,429,066	3,755,901	1,597,361	1,521,491	14,878,134	
1998	0	0	0	0	4,871,761	464,376	3,473,405	2,398,630	1,996,114	1,291,185	14,495,471	
1999	0	0	0	0	4,877,840	4,252,041	5,005,853	1,770,699	1,006,873	1,918,917	18,832,222	
2000	0	0	0	0	5,480,529	761,424	4,301,519	2,097,824	173,108	1,590,470	14,404,874	
2001	0	0	0	0	5,908,040	1,526,369	5,138,147	4,374,609	240,853	(917,948)	16,270,071	
2002	0	0	0	0	5,337,368	1,491,192	4,078,059	4,482,867	1,597,361	3,473,975	18,814,951	
2003	360	93,305	33,614	1,217,171	4,589,260	1,325,524	3,837,744	3,401,543	(581,700)	974,656	13,547,028	
2004	337	13,434	71,444	924,242	9,074,729	1,388,321	3,621,361	5,177,822	(560,699)	1,534,831	20,236,366	
2005	9,036	27,330	216,418	1,304,685	5,815,155	2,602,278	7,432,338	(575,087)	2,664,966	(1,232,048)	16,707,603	
2006	989	14,574	69,398	1,085,967	6,934,274	2,322,681	5,198,895	3,595,565	(517,903)	(4,203,838)	13,329,774	
2007	58,374	37,458	133,635	1,618,058	5,723,997	2,760,698	10,538,128	7,868,470	460,534	12,221,631	39,573,458	
2008	90,585	74,762	218,742	2,759,602	8,272,067	868,278	16,373,401	7,493,254	19,081	635,826	33,661,907	
2009	24,099	136,597	215,756	2,567,015	7,825,556	921,750	8,738,235	5,650,326	352,050	2,989,162	26,477,079	
2010	9,374	159,289	333,306	2,745,154	9,870,745	864,731	9,082,600	6,385,403	583,490	5,604,575	32,391,544	
2011	10,632	72,877	515,066	2,378,259	6,900,730	982,432	9,693,169	8,080,505	199,409	92	25,856,337	
2012	14,553	14,122	131,792	2,152,858	7,521,859	3,007,188	9,631,280	6,902,607	279,802	6,847,300	34,190,035	
2013	10,758	85,743	337,323	2,536,440	8,676,395	1,578,151	8,089,622	3,321,520	380,614	6,257,982	28,304,284	
2014	11,020	87,776	345,319	2,592,388	8,805,094	1,592,601	9,571,602	3,782,317	386,557	1,914,656	26,052,827	
2015	11,288	89,834	353,416	2,647,072	9,724,162	1,596,094	7,909,579	3,701,790	389,990	2,152,512	25,474,127	
2016	11,132	88,662	348,807	2,617,889	9,159,237	1,604,838	8,608,837	3,637,895	389,577	3,476,134	26,876,518	
2017	11,244	89,548	352,295	2,644,067	9,250,829	1,620,887	8,694,925	3,674,274	393,473	3,510,896	27,145,284	
2018	11,356	90,444	355,818	2,670,508	9,343,337	1,637,096	8,781,875	3,711,016	397,408	3,546,004	27,416,736	
2019	11,470	91,348	359,376	2,697,213	9,436,771	1,653,467	8,869,693	3,748,127	401,382	3,581,465	27,690,905	
2020	11,584	92,262	362,969	2,724,185	9,531,138	1,670,001	8,958,390	3,785,608	405,396	3,617,279	27,967,812	
2021	11,700	93,184	366,599	2,751,426	9,626,450	1,686,701	9,047,974	3,823,464	409,450	3,653,452	28,247,491	
2022	11,817	94,116	370,265	2,778,941	9,722,714	1,703,568	9,138,454	3,861,699	413,544	3,689,986	28,529,965	
2023	11,935	95,057	373,968	2,806,729	9,819,941	1,720,604	9,229,838	3,900,316	417,679	3,726,886	28,815,264	
2024	12,055	96,008	377,707	2,834,797	9,918,141	1,737,810	9,322,137	3,939,319	421,856	3,764,155	29,103,418	
2025	12,175	96,968	381,485	2,863,144	10,017,322	1,755,188	9,415,358	3,978,712	426,075	3,801,797	29,394,452	
2026	12,297	97,938	385,299	2,891,776	10,117,495	1,772,740	9,509,512	4,018,499	430,336	3,839,815	29,688,397	
2027	12,420	98,917	389,152	2,920,693	10,218,670	1,790,468	9,604,607	4,058,684	434,639	3,878,213	29,985,281	
2028	12,544	99,906	393,044	2,949,902	10,320,857	1,808,372	9,700,653	4,099,271	438,985	3,916,995	30,285,133	
2029	12,670	100,905	396,974	2,979,400	10,424,066	1,826,456	9,797,660	4,140,264	443,375	3,956,165	30,587,986	
2030	12,796	101,914	400,944	3,009,194	10,528,306	1,844,720	9,895,636	4,181,666	447,809	3,995,727	30,893,864	
2031	12,924	102,934	404,954	3,039,288	10,633,589	1,863,168	9,994,593	4,223,483	452,287	4,035,684	31,202,804	
2032	13,053	103,963	409,003	3,069,679	10,739,925	1,881,799	10,094,538	4,265,718	456,810	4,076,041	31,514,831	
2033	13,184	105,003	413,093	3,100,377	10,847,324	1,900,617	10,195,484	4,308,375	461,378	4,116,801	31,829,979	
2034	13,316	106,053	417,224	3,131,380	10,955,798	1,919,624	10,297,439	4,351,459	465,992	4,157,969	32,148,281	
2035	13,449	107,113	421,396	3,162,694	11,065,356	1,938,820	10,400,413	4,394,973	470,652	4,199,549	32,469,763	
TOTAL	496,525	2,859,344	10,655,601	84,172,193	399,557,521	74,365,826	371,846,536	194,625,167	29,225,140	150,242,587	1,219,862,778	



**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 9 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)						Total	GRAND TOTAL
	COASTAL BRANCH							
	Reach 31A (a)	Reach 33A	Reach 33B	Reach 34	Reach 35	Subtotal		
[76]	[77]	[78]	[79]	[80]	[81]	[82]	[83]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	42,918
1963	0	0	0	0	0	0	0	168,358
1964	0	0	0	0	0	0	0	184,729
1965	0	0	0	0	0	0	0	378,874
1966	0	0	0	0	0	0	0	408,397
1967	0	0	0	0	0	0	0	634,505
1968	0	0	0	0	0	0	2,160,548	2,745,160
1969	509,728	0	0	0	0	509,728	3,324,718	4,074,939
1970	609,988	0	0	0	0	609,988	3,983,062	4,676,282
1971	699,052	0	0	0	0	699,052	5,614,013	6,185,714
1972	697,576	0	0	0	0	697,576	12,353,356	12,998,869
1973	641,626	0	0	0	0	641,626	14,590,688	15,194,233
1974	669,279	0	0	0	0	669,279	16,598,762	17,372,561
1975	806,429	0	0	0	0	806,429	19,569,999	20,517,423
1976	840,927	0	0	0	0	840,927	19,002,859	20,027,213
1977	872,169	0	0	0	0	872,169	23,267,885	24,213,489
1978	934,119	0	0	0	0	934,119	24,818,739	26,012,786
1979	871,688	0	0	0	0	871,688	23,421,881	24,675,598
1980	1,047,396	4,790	0	30	75	1,052,291	30,105,348	32,038,398
1981	1,037,469	4,790	0	30	75	1,042,364	33,884,524	35,516,366
1982	1,015,555	4,790	0	30	75	1,020,450	39,515,188	41,611,655
1983	1,146,269	4,957	0	30	77	1,151,333	54,543,263	56,802,781
1984	1,427,192	5,051	0	31	78	1,432,352	63,947,633	67,105,188
1985	1,849,827	5,051	0	31	78	1,854,987	69,700,009	73,272,898
1986	1,714,723	5,051	0	31	78	1,719,883	73,437,761	76,707,917
1987	1,689,141	4,324	0	26	67	1,693,558	71,443,424	75,217,576
1988	1,964,428	4,509	0	28	70	1,969,035	72,349,117	76,060,618
1989	1,768,942	4,509	0	28	70	1,773,549	73,894,076	78,662,348
1990	2,274,772	0	0	0	0	2,274,772	86,130,115	91,361,385
1991	2,187,841	0	0	0	0	2,187,841	86,877,284	90,982,870
1992	2,465,364	0	0	0	0	2,465,364	94,167,321	99,235,524
1993	2,811,441	0	0	0	0	2,811,441	100,019,568	107,299,130
1994	3,894,639	0	0	0	0	3,894,639	92,336,811	99,944,106
1995	3,481,049	0	0	0	0	3,481,049	98,887,435	105,659,504
1996	5,144,684	0	0	0	0	5,144,684	105,119,193	112,018,784
1997	2,523,741	(33)	0	0	0	2,523,708	107,647,058	113,385,326
1998	4,302,712	1,878,365	1,386	160,400	88,026	6,430,889	120,649,996	127,316,519
1999	4,247,118	1,957,943	16,646	184,325	87,373	6,493,404	127,171,443	136,479,879
2000	2,904,145	2,533,780	20,786	253,538	109,328	5,821,577	122,481,416	131,183,625
2001	3,116,906	2,241,988	14,426	153,879	58,875	5,586,074	135,946,494	143,301,662
2002	3,178,461	2,690,064	49,511	189,458	81,857	6,189,350	125,073,018	136,694,078
2003	3,368,380	2,817,400	44,211	200,986	85,015	6,515,992	128,163,251	137,171,162
2004	3,578,779	2,717,353	69,895	240,426	109,830	6,716,283	146,916,096	157,118,404
2005	3,856,336	2,991,661	120,379	292,354	137,878	7,398,608	123,189,878	131,317,605
2006	2,542,352	3,233,309	110,280	203,484	112,691	6,202,115	128,918,493	136,962,549
2007	3,211,733	3,085,107	128,889	117,474	83,237	6,626,440	160,113,847	169,803,852
2008	5,580,404	4,367,564	158,215	127,350	86,286	10,319,818	181,429,617	192,002,510
2009	5,146,372	3,803,430	126,090	118,036	76,407	9,270,336	161,142,803	171,384,427
2010	6,446,200	6,587,896	203,619	168,652	110,769	13,517,136	164,042,600	175,766,620
2011	6,131,358	5,920,886	146,747	172,517	106,314	12,477,822	174,210,750	186,894,520
2012	5,342,756	6,662,598	90,737	163,181	97,961	12,357,234	195,672,544	211,389,304
2013	6,326,919	6,339,174	0	0	0	12,666,093	195,869,071	209,326,504
2014	<b>8,622,629</b>	<b>6,261,121</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14,883,750</b>	<b>198,589,080</b>	<b>212,320,627</b>
2015	6,219,648	5,992,886	0	0	0	12,212,534	182,441,980	196,190,544
2016	7,126,962	6,259,704	0	0	0	13,386,666	194,223,045	208,005,349
2017	7,198,232	6,322,301	0	0	0	13,520,533	196,165,274	210,085,404
2018	7,270,214	6,385,524	0	0	0	13,655,738	198,126,927	212,186,257
2019	7,342,916	6,449,380	0	0	0	13,792,296	200,108,198	214,308,122
2020	7,416,345	6,513,873	0	0	0	13,930,218	202,109,279	216,451,201
2021	7,490,509	6,579,012	0	0	0	14,069,521	204,130,368	218,615,711
2022	7,565,414	6,644,802	0	0	0	14,210,216	206,171,673	220,801,869
2023	7,641,068	6,711,250	0	0	0	14,352,318	208,233,388	223,009,884
2024	7,717,479	6,778,363	0	0	0	14,495,842	210,315,723	225,239,985
2025	7,794,653	6,846,146	0	0	0	14,640,799	212,418,881	227,492,385
2026	7,872,600	6,914,608	0	0	0	14,787,208	214,543,071	229,767,311
2027	7,951,326	6,983,754	0	0	0	14,935,080	216,688,503	232,064,985
2028	8,030,839	7,053,591	0	0	0	15,084,430	218,855,388	234,385,635
2029	8,111,148	7,124,127	0	0	0	15,235,275	221,043,944	236,729,494
2030	8,192,259	7,195,369	0	0	0	15,387,628	223,254,380	239,096,785
2031	8,274,182	7,267,322	0	0	0	15,541,504	225,486,924	241,487,752
2032	8,356,923	7,339,996	0	0	0	15,696,919	227,741,795	243,902,631
2033	8,440,493	7,413,396	0	0	0	15,853,889	230,019,213	246,341,660
2034	8,524,898	7,487,529	0	0	0	16,012,427	232,319,406	248,805,076
2035	8,610,147	7,562,405	0	0	0	16,172,552	234,642,598	251,293,123
<b>TOTAL</b>	<b>288,648,868</b>	<b>209,962,766</b>	<b>1,301,817</b>	<b>2,746,353</b>	<b>1,432,591</b>	<b>504,092,395</b>	<b>8,571,331,993</b>	<b>9,156,089,232</b>

(a) Includes certain costs to be assigned directly to Kern County Water Agency. Refer to Appendix B text discussion of Table B-16A under "Project Water Charges."

## Tables B-12 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-12 Variable OMP&R Costs to be Reimbursed through Variable OMP&R Component of Transportation Charge<sup>a</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AQUEDUCT				SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT		
	Reach 1	Reach 3A	Reach 3B	Total	Reach 1	Reach 1	Reach 4	Reach 14A
	Barker Slough Pumping Plant	Cordelia Pumping Plant (Solano)	Cordelia Pumping Plant (Napa) (b)		South Bay & Del Valle Pumping Plants (c)	Banks Pumping Plant	Dos Amigos Pumping Plant	Buena Vista Pumping Plant
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1962	0	0	0	0	36,970	0	0	0
1963	0	0	0	0	57,711	0	0	0
1964	0	0	0	0	74,134	0	0	0
1965	0	0	0	0	142,609	0	0	0
1966	0	0	0	0	192,605	0	0	0
1967	0	0	0	0	223,117	13,881	0	0
1968	0	0	6,989	6,989	336,671	452,630	202,947	0
1969	0	0	8,551	8,551	257,579	293,741	135,425	0
1970	0	0	13,598	13,598	396,358	346,215	211,197	1
1971	0	0	10,609	10,609	381,662	574,015	225,188	115,801
1972	0	0	14,434	14,434	598,702	933,292	502,196	198,914
1973	0	0	14,449	14,449	493,490	688,030	381,232	263,468
1974	0	0	17,473	17,473	565,575	783,562	447,772	315,939
1975	0	0	14,779	14,779	349,758	1,341,019	518,816	508,060
1976	0	0	20,856	20,856	571,361	1,638,453	641,115	712,947
1977	0	0	22,635	22,635	512,996	1,013,307	284,828	267,467
1978	0	0	21,692	21,692	586,355	2,339,502	607,042	689,236
1979	0	0	16,237	16,237	605,136	3,554,256	1,008,564	776,016
1980	0	0	19,945	19,945	523,369	2,083,336	1,129,152	1,051,629
1981	0	0	23,842	23,842	567,692	3,952,931	1,939,189	1,336,867
1982	0	0	12,157	12,157	605,780	3,082,031	1,363,705	1,200,226
1983	0	0	2,342	2,342	82,222	1,001,612	396,086	450,801
1984	0	0	4,822	4,822	271,543	1,856,959	976,773	823,681
1985	0	0	10,188	10,188	451,020	3,186,029	1,621,418	1,409,980
1986	0	0	15,501	15,501	814,111	6,595,625	2,627,407	2,405,224
1987	0	0	27,223	27,223	888,558	5,740,403	2,518,308	2,231,491
1988	17,813	0	24,020	41,833	911,176	6,276,214	2,610,048	2,560,122
1989	29,819	43,846	26,519	100,184	1,163,619	9,847,706	3,953,735	4,042,211
1990	52,210	67,109	40,775	160,094	1,834,626	10,460,533	4,498,260	5,779,750
1991	10,429	10,118	5,252	25,799	420,688	1,882,952	491,071	904,541
1992	13,319	13,070	9,406	35,795	339,021	3,129,419	1,147,502	1,221,282
1993	(11,941)	(8,753)	(5,392)	(26,086)	(150,856)	497,455	326,100	(108,089)
1994	46,791	39,624	29,189	115,604	801,374	5,677,009	2,305,603	2,523,572
1995	20,014	20,620	11,791	52,425	302,558	3,805,713	1,451,578	815,572
1996	57,320	47,288	23,483	128,091	718,807	8,192,821	4,009,531	2,493,264
1997	67,416	52,935	21,955	142,306	1,038,568	6,900,694	2,845,506	2,589,077
1998	(11,427)	(10,141)	(4,879)	(26,447)	(130,734)	185,756	(336,341)	(263,072)
1999	31,419	25,288	11,623	68,330	408,566	6,753,244	2,307,304	1,581,950
2000	54,907	40,414	14,327	109,648	864,185	7,621,716	2,881,170	2,797,632
2001	357,243	250,132	214,039	821,415	4,065,497	23,769,597	9,711,120	14,552,225
2002	189,982	104,564	61,470	356,016	2,324,926	17,025,395	6,894,112	8,423,370
2003	177,980	118,446	97,810	394,235	2,570,189	21,155,445	8,877,641	10,398,364
2004	248,084	138,880	106,974	493,938	2,548,576	21,459,794	9,281,189	12,219,983
2005	282,150	146,837	148,291	577,278	2,817,761	28,116,884	12,374,398	11,432,856
2006	225,231	110,822	143,686	479,739	2,680,206	22,480,747	10,069,517	10,844,436
2007	441,074	223,276	253,867	918,217	4,192,181	24,793,481	10,693,088	15,880,610
2008	399,745	183,126	288,324	871,195	3,173,501	16,432,970	5,746,177	10,589,053
2009	239,299	114,295	177,918	531,511	2,747,087	9,942,761	4,502,400	7,597,451
2010	272,407	110,606	230,893	613,905	2,472,113	25,174,086	9,705,870	10,515,345
2011	291,752	113,185	258,372	663,309	3,683,189	36,928,151	15,716,743	14,634,063
2012	252,273	136,221	176,085	564,579	3,781,371	30,948,081	12,172,639	14,354,358
2013	711,665	212,258	833,139	1,557,062	5,672,667	40,756,513	15,525,544	19,314,490
2014	750,375	196,249	723,250	1,669,874	5,855,409	46,315,245	16,299,038	20,346,112
2015	694,974	383,255	663,264	1,741,493	6,585,187	45,323,173	16,807,572	21,101,971
2016	485,440	260,765	547,224	1,293,429	4,986,539	29,382,919	15,025,449	19,276,691
2017	485,440	260,412	546,914	1,292,766	4,986,539	37,961,825	15,022,179	19,270,821
2018	485,440	262,632	548,866	1,296,938	5,047,023	20,481,020	15,045,594	19,394,377
2019	485,440	262,632	548,866	1,296,938	5,047,023	40,376,412	15,045,594	19,386,240
2020	485,440	262,632	548,866	1,296,938	5,047,023	32,255,012	15,045,594	19,389,727
2021	485,440	262,632	548,866	1,296,938	5,047,023	36,361,217	15,045,594	19,399,026
2022	485,440	262,632	548,866	1,296,938	5,047,022	25,351,973	15,045,594	19,409,488
2023	485,440	262,632	548,866	1,296,938	5,047,023	38,363,568	15,045,594	19,418,788
2024	485,440	262,632	548,866	1,296,938	5,047,023	33,692,630	15,045,594	19,429,250
2025	485,440	262,632	548,866	1,296,938	5,047,023	25,553,360	15,045,594	19,438,549
2026	485,440	262,632	548,866	1,296,938	5,047,023	40,050,068	15,045,594	19,444,362
2027	485,440	262,632	548,866	1,296,938	5,047,023	20,855,788	15,045,594	19,451,336
2028	485,440	262,632	548,866	1,296,938	5,047,023	32,255,012	15,045,594	19,457,148
2029	485,440	262,632	548,866	1,296,938	5,047,023	45,286,670	15,045,594	19,465,286
2030	485,440	262,632	548,866	1,296,938	5,047,023	28,171,919	15,045,594	19,472,260
2031	485,440	262,632	548,866	1,296,938	5,047,023	30,102,595	15,045,594	19,482,722
2032	485,440	262,632	548,866	1,296,938	5,047,023	36,156,721	15,045,594	19,492,021
2033	485,440	262,632	548,866	1,296,938	5,047,022	34,199,127	15,045,594	19,501,321
2034	485,440	262,632	548,866	1,296,938	5,047,023	34,052,649	15,045,594	19,510,621
2035	485,440	262,632	548,866	1,296,938	5,047,023	32,536,604	15,045,594	19,519,920
<b>TOTAL</b>	<b>15,621,124</b>	<b>8,132,121</b>	<b>15,657,498</b>	<b>39,410,743</b>	<b>175,098,031</b>	<b>1,176,771,472</b>	<b>511,474,794</b>	<b>632,510,201</b>

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."

(b) Costs for the period 1968 through 1987 are for an interim facility.

(c) The relatively minor costs of Del Valle Pumping Plant have been combined with those of South Bay Pumping Plant to simplify the allocation procedures.

**TABLE B-12 Variable OMP&R Costs to be Reimbursed through  
Variable OMP&R Component of Transportation Charge<sup>a</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						
	Reach 15A	Reach 16A	Reach 17E	Reach 18A	Reach 22B	Reach 23	Reach 24
	Wheeler Ridge Pumping Plant	Chrisman Pumping Plant	Edmonston Pumping Plant	Alamo Powerplant	Pearblossom Pumping Plant	Mojave Siphon Powerplant	Silverwood Lake (d)
	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1962	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0
1971	2,564	0	0	0	0	0	0
1972	68,304	142,902	542,625	0	3,468	0	0
1973	236,623	387,198	1,548,428	0	202,289	0	0
1974	324,966	564,464	2,164,223	0	324,993	0	0
1975	552,952	1,095,331	4,010,395	0	575,061	0	0
1976	713,875	1,506,985	5,443,936	0	889,544	0	0
1977	303,107	657,108	2,360,624	0	315,128	0	0
1978	616,104	1,132,296	4,180,131	0	1,508,115	0	0
1979	749,188	1,526,850	5,475,688	0	1,838,687	0	0
1980	1,047,495	2,102,439	7,028,235	0	1,762,063	0	0
1981	1,319,739	2,838,773	9,351,931	0	2,296,771	0	0
1982	1,213,660	2,424,920	8,352,207	0	1,498,620	0	0
1983	432,165	793,915	2,375,225	0	397,766	0	0
1984	770,618	1,479,784	4,585,198	0	624,213	0	0
1985	1,411,621	2,812,461	9,365,591	0	1,226,515	0	0
1986	2,432,322	4,999,949	16,956,023	(1,013,756)	2,359,599	0	0
1987	2,213,047	4,434,510	14,612,448	(1,017,868)	1,814,728	0	243,983
1988	2,557,952	5,120,998	16,801,811	(742,800)	2,370,395	0	37,927
1989	4,061,396	8,559,270	28,732,499	(788,139)	4,228,697	0	50,884
1990	6,013,924	13,616,111	48,319,508	(832,947)	6,490,357	0	187,259
1991	1,032,050	2,427,880	8,647,065	(269,625)	996,352	0	0
1992	1,274,895	2,560,253	8,575,989	(916,154)	1,142,454	0	317,172
1993	(86,676)	(490,235)	(2,223,221)	(55,346)	(245,059)	0	(79,954)
1994	2,537,943	5,323,430	18,470,003	(59,356)	2,605,813	0	0
1995	725,389	1,435,098	4,738,967	(1,187,312)	972,086	0	777,343
1996	2,299,388	4,875,010	17,027,386	(2,788,262)	2,647,473	(914,092)	1,053,254
1997	2,417,154	5,424,334	19,413,834	(2,488,338)	3,037,087	(1,680,469)	0
1998	(236,322)	(524,933)	(1,809,182)	(1,969,187)	(431,135)	(1,217,950)	(149,186)
1999	1,288,328	3,316,481	12,854,526	(2,851,993)	1,861,548	(2,533,429)	71,918
2000	2,864,458	6,591,623	23,781,921	(5,070,499)	3,719,175	(4,371,978)	0
2001	14,906,925	33,563,884	123,983,040	(3,276,174)	18,888,282	(3,621,886)	929,424
2002	8,731,681	19,721,183	72,470,283	(4,919,131)	10,667,925	(5,247,076)	95,264
2003	10,819,647	24,646,995	90,690,783	(3,362,477)	14,531,277	(6,610,346)	232,125
2004	12,829,748	29,292,672	107,692,928	(6,248,061)	16,949,136	(7,691,613)	0
2005	11,693,005	26,503,870	94,317,312	(5,791,742)	17,473,742	(6,359,950)	0
2006	11,012,925	25,100,320	84,425,736	(4,019,245)	16,345,933	(6,342,354)	0
2007	16,402,216	37,085,954	127,068,375	(2,976,651)	19,650,507	(5,872,118)	0
2008	11,638,471	23,475,494	81,278,636	(3,305,736)	11,111,722	(3,203,162)	322,434
2009	8,053,530	17,479,228	66,401,381	(3,096,612)	8,514,363	(2,225,065)	2,016
2010	10,678,764	24,106,431	87,888,621	(4,904,985)	16,522,903	(5,529,305)	0
2011	14,670,442	32,902,311	111,284,936	(6,340,408)	22,645,483	(7,675,669)	492,803
2012	14,400,390	32,580,010	120,237,423	(2,308,786)	18,966,679	(8,832,685)	0
2013	22,387,903	47,690,749	164,268,364	(5,159,312)	25,732,240	(10,671,376)	0
2014	<b>23,547,528</b>	<b>50,165,599</b>	<b>172,983,514</b>	<b>(7,357,988)</b>	<b>26,222,343</b>	<b>(10,397,504)</b>	<b>0</b>
2015	24,427,002	52,043,537	179,570,845	(7,391,508)	27,249,256	(10,519,232)	0
2016	19,871,486	45,416,407	166,437,824	(8,201,722)	22,965,587	(9,784,612)	3,722,062
2017	19,865,120	45,401,638	166,382,890	(8,193,188)	22,806,546	(9,716,852)	0
2018	20,011,846	45,620,545	167,284,160	(9,020,282)	25,837,760	(11,008,317)	5,800,372
2019	20,003,021	45,600,074	167,208,013	(9,016,820)	25,837,760	(11,008,317)	0
2020	20,006,804	45,608,847	167,240,648	(9,000,478)	25,837,760	(11,008,317)	0
2021	20,016,889	45,632,244	167,327,678	(9,018,857)	25,837,760	(11,008,318)	133,831
2022	20,028,236	45,658,564	167,425,580	(9,018,824)	25,837,760	(11,008,317)	3,162,081
2023	20,038,322	45,681,961	167,512,606	(9,004,798)	25,837,760	(11,008,317)	1,938,821
2024	20,049,669	45,708,283	167,610,514	(9,018,713)	25,837,761	(11,008,317)	0
2025	20,059,755	45,731,680	167,697,542	(9,018,657)	25,837,761	(11,008,317)	3,009,579
2026	20,066,059	45,746,304	167,751,931	(9,000,189)	25,837,761	(11,008,318)	0
2027	20,073,623	45,763,851	167,817,200	(9,018,545)	25,837,761	(11,008,317)	1,265,709
2028	20,079,927	45,778,473	167,871,591	(9,018,534)	25,837,760	(11,008,317)	0
2029	20,088,753	45,798,946	167,947,745	(9,004,519)	25,837,760	(11,008,317)	733,376
2030	20,096,317	45,816,494	168,013,013	(9,018,412)	25,837,761	(11,008,317)	0
2031	20,107,664	45,842,815	168,110,920	(9,018,390)	25,837,760	(11,008,317)	5,752,321
2032	20,117,750	45,866,213	168,197,944	(8,999,922)	25,837,761	(11,008,317)	0
2033	20,127,836	45,889,609	168,284,970	(9,018,345)	25,837,760	(11,008,317)	2,885,264
2034	20,137,922	45,913,005	168,371,995	(9,018,278)	25,837,760	(11,008,317)	0
2035	20,148,008	45,936,402	168,459,022	(9,004,274)	25,837,760	(11,008,317)	3,949,269
TOTAL	658,353,413	1,477,905,799	5,339,199,978	(271,142,145)	829,356,414	(329,168,431)	36,937,352

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."  
 (d) These values represent a proportionate allocation of the total variable OMP&R costs of pumping and recovery plants (Table B-3) associated with net annual withdrawals from storage for Project Transportation Facilities. The allocation is determined annually by applying the following ratio, calculated from the data shown in Table B-6: "Reservoir Storage Changes" (withdrawals, as a positive value) conveyed through each plant, divided by "Total" annual quantity conveyed through each plant, in acre-feet. The costs so determined are accumulated for all upstream plants for each year, for each respective reservoir.

**TABLE B-12 Variable OMP&R Costs to be Reimbursed through  
Variable OMP&R Component of Transportation Charge<sup>a</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						
	Reach 26A	EBX Reach 2B	EBX Reach 3A	EBX Reach 4B	Reach 28J	Reach 29A	Reach 29G
	Devil Canyon Powerplant [16]	Greenspot Pumping Plant [17]	Crafton Hills Pumping Plant [18]	Cherry Valley Pumping Plant [19]	Lake Perris (d) [20]	Oso Pumping Plant [21]	Warne Powerplant [22]
1962	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0
1972	(3,024)	0	0	0	0	79,315	0
1973	(461,268)	0	0	0	0	122,787	0
1974	(546,156)	0	0	0	0	157,511	0
1975	(1,095,523)	0	0	0	0	314,636	0
1976	(1,566,056)	0	0	0	0	326,967	0
1977	(1,222,866)	0	0	0	0	75,335	0
1978	(3,085,094)	0	0	0	0	89,383	0
1979	(3,466,481)	0	0	0	0	102,584	0
1980	(3,318,152)	0	0	0	0	236,768	0
1981	(3,842,971)	0	0	0	0	444,280	0
1982	(2,736,072)	0	0	0	0	539,245	(783,626)
1983	(5,478,830)	0	0	0	0	214,069	(1,488,439)
1984	(7,350,989)	0	0	0	0	484,239	(4,088,209)
1985	(10,748,103)	0	0	0	0	874,069	(5,930,176)
1986	(11,484,996)	0	0	0	0	1,269,590	(5,579,301)
1987	(10,814,483)	0	0	0	53,242	1,323,472	(6,292,822)
1988	(14,495,967)	0	0	0	0	1,421,372	(6,994,588)
1989	(18,688,631)	0	0	0	0	2,046,005	(8,368,716)
1990	(20,911,839)	0	0	0	147,163	2,857,442	(11,011,193)
1991	(4,884,013)	0	0	0	0	535,456	(3,604,791)
1992	(9,513,281)	0	0	0	(61,233)	686,984	(5,272,726)
1993	(7,502,549)	0	0	0	0	51,327	(3,380,473)
1994	(11,815,745)	0	0	0	80,824	1,210,469	(5,835,219)
1995	(9,742,248)	0	0	0	0	151,109	(1,179,155)
1996	(12,358,465)	0	0	0	0	895,929	(4,248,531)
1997	(13,293,791)	0	0	0	111,776	897,657	(4,797,589)
1998	(10,108,555)	0	0	0	0	(27,767)	(746,113)
1999	(14,952,833)	0	0	0	(44,587)	655,690	(5,341,364)
2000	(25,522,757)	0	0	0	(125,537)	1,154,161	(9,464,490)
2001	(19,510,278)	0	0	0	0	6,139,290	(7,614,510)
2002	(24,676,763)	0	0	0	0	3,806,290	(10,286,903)
2003	(27,490,216)	0	0	0	1,150,417	4,339,466	(9,899,070)
2004	(31,246,167)	78,351	68,735	7,271	0	5,393,913	(11,835,098)
2005	(28,682,474)	69,550	48,964	2,568	5,125,447	3,413,375	(6,683,632)
2006	(34,389,659)	139,168	152,477	18,724	0	2,619,701	(6,870,988)
2007	(28,529,045)	270,007	265,495	14,439	590,951	6,265,421	(9,522,236)
2008	(16,403,544)	271,495	347,089	10,854	0	4,617,331	(7,184,125)
2009	(13,474,182)	352,859	370,980	9,806	407,632	4,050,151	(6,578,745)
2010	(24,427,811)	328,452	432,929	22,374	0	3,249,863	(5,697,650)
2011	(31,980,782)	382,268	495,663	35,492	0	3,212,335	(5,505,320)
2012	(23,502,165)	518,376	614,329	58,412	239,983	5,722,060	(8,431,322)
2013	(22,601,420)	427,674	523,480	89,776	16,789	8,560,208	(9,323,896)
<b>2014</b>	<b>(22,018,944)</b>	<b>423,179</b>	<b>528,123</b>	<b>65,896</b>	<b>13,958</b>	<b>9,236,740</b>	<b>(9,883,972)</b>
2015	(22,677,380)	439,270	548,204	107,800	15,467	9,603,463	(10,141,080)
2016	(21,927,345)	432,120	539,282	0	199,747	8,339,104	(10,486,433)
2017	(21,927,345)	432,120	539,282	0	0	8,339,104	(10,488,280)
2018	(24,575,461)	432,120	539,282	0	3,169,096	7,333,303	(9,113,728)
2019	(24,575,462)	432,120	539,282	0	0	7,324,336	(9,103,501)
2020	(24,575,462)	432,120	539,282	0	2,677,701	7,328,179	(9,108,716)
2021	(24,575,462)	432,120	539,282	0	61,969	7,338,427	(9,119,573)
2022	(24,575,462)	432,120	539,282	0	0	7,349,956	(9,132,722)
2023	(24,575,461)	432,120	539,282	0	1,337,877	7,360,204	(9,144,411)
2024	(24,575,462)	432,120	539,282	0	0	7,371,733	(9,158,393)
2025	(24,575,462)	432,120	539,282	0	0	7,381,981	(9,168,333)
2026	(24,575,462)	432,120	539,282	0	588,549	7,388,386	(9,175,638)
2027	(24,575,462)	432,120	539,282	0	0	7,396,072	(9,182,571)
2028	(24,575,462)	432,120	539,282	0	822,743	7,402,476	(9,189,792)
2029	(24,575,461)	432,120	539,282	0	0	7,411,444	(9,197,354)
2030	(24,575,462)	432,120	539,282	0	0	7,419,130	(9,206,121)
2031	(24,575,462)	432,120	539,282	0	330,601	7,430,659	(9,216,521)
2032	(24,575,462)	432,120	539,282	0	0	7,440,907	(9,226,292)
2033	(24,575,462)	432,120	539,282	0	3,923,076	7,451,155	(9,237,148)
2034	(24,575,462)	432,120	539,282	0	0	7,461,402	(9,247,920)
2035	(24,575,461)	432,120	539,282	0	5,985,129	7,471,650	(9,256,859)
<b>TOTAL</b>	<b>(1,098,835,570)</b>	<b>12,343,050</b>	<b>15,182,108</b>	<b>443,412</b>	<b>26,818,778</b>	<b>249,159,299</b>	<b>(406,026,374)</b>

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."



**TABLE B-12 Variable OMP&R Costs to be Reimbursed through  
Variable OMP&R Component of Transportation Charge<sup>a</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						GRAND TOTAL
	Reach 29H	Reach 29J	Reach 30	Reach 31A	Reach 33A	Total	
	Pyramid Lake (d [23])	Castaic Powerplant [24]	Castaic Lake (d [25])	Las Perillas & Badger Hill Pumping Plants [26]	Devil's Den, Bluestone & Polonio Pumping Plants [27]		
1962	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	192,605
1967	0	0	0	0	0	13,881	236,998
1968	0	0	0	118,676	0	774,253	1,117,913
1969	0	0	0	78,350	0	507,516	773,646
1970	0	0	0	136,429	0	693,842	1,103,798
1971	0	0	0	166,296	0	1,083,864	1,476,135
1972	0	(211,144)	0	237,638	0	2,494,486	3,107,622
1973	0	(1,057,564)	0	120,913	0	2,432,136	2,940,075
1974	0	(1,547,884)	0	118,582	0	3,107,972	3,691,020
1975	0	(2,455,461)	0	94,848	0	5,460,134	5,824,671
1976	0	(2,827,557)	0	141,260	0	7,621,469	8,213,686
1977	0	(3,734,462)	0	71,311	0	390,887	926,518
1978	0	(1,542,479)	0	179,925	0	6,714,161	7,322,208
1979	0	(2,773,323)	0	192,126	0	8,984,155	9,605,528
1980	0	(3,408,863)	0	168,458	0	9,882,560	10,425,874
1981	0	(2,834,322)	0	169,177	0	16,972,365	17,563,899
1982	0	(3,463,971)	0	168,390	0	12,859,335	13,477,272
1983	0	(6,649,626)	0	17,920	0	(7,537,336)	(7,452,772)
1984	0	(4,710,802)	0	112,679	0	(4,435,856)	(4,159,491)
1985	0	(15,698,638)	0	146,843	0	(10,322,390)	(9,861,182)
1986	0	(11,072,448)	0	297,886	0	10,793,124	11,622,736
1987	80,822	(11,557,616)	(43,085)	245,082	0	5,785,662	6,701,443
1988	54,038	(12,295,001)	(210,845)	214,519	0	5,286,195	6,239,204
1989	84,370	(14,812,039)	89,852	282,180	0	23,321,280	24,585,083
1990	0	(20,116,741)	245,034	416,832	0	46,159,453	48,154,173
1991	432,382	(6,579,194)	0	3,610	0	2,015,736	2,462,223
1992	29,879	(9,167,653)	(1,141,229)	101,665	0	(5,884,782)	(5,509,966)
1993	(675,438)	(7,895,978)	(2,751,590)	(111,306)	0	(24,731,032)	(24,907,974)
1994	0	(10,565,940)	(81,262)	206,086	(1,127)	12,582,103	13,499,081
1995	544,099	(4,049,615)	0	243,434	0	(497,942)	(142,959)
1996	0	(8,457,232)	0	296,170	0	15,023,644	15,870,542
1997	0	(8,727,328)	(897)	298,483	208,816	13,156,006	14,336,880
1998	(965,988)	(3,360,851)	(2,139,549)	(55,491)	(92,902)	(24,248,768)	(24,405,949)
1999	0	(9,672,802)	0	160,203	228,670	(4,317,144)	(3,840,249)
2000	0	(17,958,033)	0	219,325	361,521	(10,520,593)	(9,546,760)
2001	999,629	(13,495,346)	2,413,037	1,082,131	2,162,821	205,583,212	210,470,123
2002	0	(18,455,025)	0	544,053	1,351,161	86,145,817	88,826,760
2003	833,695	(16,903,355)	964,514	637,237	1,525,933	126,538,075	129,502,499
2004	221,340	(21,110,644)	682,258	670,805	1,774,635	140,491,177	143,533,692
2005	4,739,141	(12,763,664)	4,527,400	840,691	1,703,422	162,101,163	165,496,202
2006	531,139	(11,822,176)	6,106,188	819,111	1,376,878	128,598,576	131,758,521
2007	0	(19,017,327)	0	1,284,937	2,278,731	196,626,835	201,737,232
2008	0	(14,961,833)	1,325,984	1,066,593	1,644,428	124,820,332	128,865,028
2009	403,904	(16,146,570)	0	768,407	1,332,473	88,666,169	91,944,768
2010	0	(10,738,810)	0	938,397	1,617,484	139,882,956	142,968,974
2011	0	(11,102,175)	1,978,716	1,197,550	2,488,208	196,460,810	200,807,308
2012	200,928	(15,597,679)	0	1,038,567	1,689,415	195,069,016	199,414,966
2013	503,063	(15,957,500)	0	1,422,118	3,581,244	287,086,651	294,316,380
2014	0	<b>(16,445,000)</b>	<b>332,615</b>	<b>1,501,802</b>	<b>3,692,166</b>	<b>305,570,450</b>	<b>313,095,733</b>
2015	0	(16,500,000)	0	1,545,503	3,846,957	315,400,820	323,727,500
2016	0	(15,468,996)	1,115,564	612,532	3,646,437	271,114,103	277,394,071
2017	0	(15,468,995)	0	612,532	3,646,437	274,485,834	280,765,139
2018	0	(13,583,135)	4,779,319	701,224	4,497,092	273,626,187	279,970,148
2019	0	(13,566,322)	0	701,224	4,497,092	279,680,746	286,024,707
2020	0	(13,573,528)	0	701,224	4,497,092	274,293,489	280,637,450
2021	0	(13,592,742)	0	701,224	4,497,092	276,009,401	282,353,362
2022	0	(13,614,359)	7,363	701,224	4,497,092	268,096,629	274,440,589
2023	0	(13,633,574)	51,820	701,224	4,497,092	281,390,479	287,734,440
2024	0	(13,655,191)	1,505,897	701,224	4,497,092	275,004,973	281,348,934
2025	0	(13,674,405)	135,514	701,224	4,497,092	268,615,859	274,959,820
2026	0	(13,686,414)	0	701,224	4,497,092	280,642,711	286,986,672
2027	0	(13,700,826)	1,731,678	701,224	4,497,092	263,922,609	270,266,570
2028	0	(13,712,835)	0	701,224	4,497,092	273,215,502	279,559,463
2029	0	(13,729,648)	1,281,816	701,224	4,497,092	287,551,809	293,895,770
2030	0	(13,744,059)	0	701,224	4,497,092	268,489,835	274,833,796
2031	0	(13,765,676)	10,679,333	701,224	4,497,092	287,308,336	293,652,297
2032	0	(13,784,890)	0	701,224	4,497,092	276,729,746	283,073,707
2033	0	(13,804,105)	9,175,056	701,224	4,497,092	290,847,110	297,191,070
2034	0	(13,823,320)	0	701,224	4,497,092	274,827,369	281,171,330
2035	0	(13,842,535)	33,720,362	701,224	4,497,092	317,091,992	323,435,953
<b>TOTAL</b>	<b>8,017,003</b>	<b>(717,647,226)</b>	<b>76,480,864</b>	<b>34,461,498</b>	<b>121,011,463</b>	<b>8,383,607,153</b>	<b>8,598,115,926</b>

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."

**TABLE B-13 Capital and Operating Costs of Project Conservation Facilities to be Reimbursed through Delta Water Charge**

(in dollars)

Calendar Year	Initial Project Conservation Facilities (Portions of Upper Feather Lakes, Oroville-Thermalito and California Aqueduct Facilities)					Planning and Pre-operating Costs (a,f)	Total
	Capital Costs (a)	Capital Cost Credits (b)	Operating Costs (c)	Application of Oroville Power Revenues to:			
				Capital Costs (d)	Operating Costs (e)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	
1952	171,322	0	0	0	0	0	171,322
1953	312,190	0	0	0	0	0	312,190
1954	308,624	0	0	0	0	0	308,624
1955	194,645	0	0	0	0	0	194,645
1956	1,357,077	0	0	0	0	0	1,357,077
1957	6,210,709	0	0	0	0	0	6,210,709
1958	9,510,916	0	0	0	0	0	9,510,916
1959	11,390,586	0	0	0	0	0	11,390,586
1960	14,463,274	(4,850,000)	0	0	0	0	9,613,274
1961	18,729,965	(431,527)	0	0	0	0	18,298,438
1962	9,099,967	(479,280)	0	0	0	0	8,620,687
1963	73,098,107	(478,743)	(14,000)	0	0	0	72,609,364
1964	62,529,003	(751,330)	(14,000)	0	0	107,780	61,971,453
1965	71,048,877	(763,541)	(14,000)	0	0	551,850	70,823,186
1966	125,376,541	(748,649)	(14,000)	0	0	1,081,023	125,694,915
1967	94,481,603	(812,145)	(13,446)	0	0	1,189,212	94,845,224
1968	39,986,145	(431,574)	1,303,821	(951,000)	0	793,399	40,700,791
1969	5,367,865	(259,015)	2,890,772	(11,007,000)	0	601,867	(2,405,511)
1970	4,208,411	(203,733)	4,818,634	(14,650,000)	(1,500,000)	516,659	(6,810,029)
1971	3,956,703	(193,631)	6,026,480	(14,650,000)	(1,500,000)	408,754	(5,951,694)
1972	4,662,255	(196,361)	5,393,011	(14,650,000)	(1,500,000)	287,374	(6,003,721)
1973	4,090,078	(136,997)	6,135,774	(14,650,000)	(1,500,000)	203,384	(5,857,761)
1974	6,852,718	(137,503)	6,944,723	(17,950,000)	(1,500,000)	201,907	(5,588,155)
1975	8,343,833	(234,567)	7,697,390	(14,650,000)	(1,500,000)	146,188	(197,156)
1976	6,189,618	(204,944)	7,067,037	(14,650,000)	(1,500,000)	205,234	(2,893,055)
1977	21,554,452	(150,214)	10,547,977	(14,650,000)	(1,500,000)	857,419	16,659,634
1978	8,031,393	(64,566)	12,851,158	(14,650,000)	(1,500,000)	2,131,286	6,799,271
1979	9,751,861	0	9,547,014	(14,650,000)	(1,500,000)	2,131,884	9,390,759
1980	11,345,574	0	13,256,298	(14,650,000)	(1,500,000)	3,638,851	12,082,723
1981	11,921,267	0	10,326,538	(14,650,000)	(1,500,000)	4,597,474	10,695,279
1982	17,479,059	0	16,154,872	(14,650,000)	(1,500,000)	4,594,682	22,078,613
1983	12,763,378	0	22,251,331	(34,705,000)	(8,735,000)	3,751,983	(4,673,298)
1984	9,367,268	0	22,700,224	(14,650,000)	(10,348,000)	2,979,126	10,048,618
1985	12,538,173	0	23,462,283	(14,650,000)	(8,198,000)	2,069,024	15,221,480
1986	21,586,488	0	26,479,379	(14,650,000)	(9,107,000)	1,602,419	25,911,286
1987	32,734,633	0	23,478,839	(14,650,000)	(9,451,000)	1,762,179	33,875,651
1988	33,028,679	0	25,832,491	(14,650,000)	(8,677,000)	1,808,899	37,343,069
1989	11,075,132	0	28,442,946	(14,650,000)	(8,102,000)	2,678,007	19,444,085
1990	28,764,328	0	37,430,776	(14,650,000)	(8,498,000)	1,436,712	44,483,816
1991	37,462,303	0	76,586,450	(14,650,000)	(9,487,000)	1,727,664	91,639,417
1992	29,169,134	0	32,280,229	(14,650,000)	(8,526,000)	1,707,822	39,981,185
1993	22,366,873	0	36,884,103	(14,650,000)	(8,768,000)	1,708,490	37,541,465
1994	14,709,626	0	41,193,693	(14,650,000)	(7,484,000)	2,134,389	35,903,711
1995	15,120,856	0	46,162,374	(14,650,000)	(4,376,939)	2,042,481	43,698,773
1996	10,992,358	0	50,885,567	(14,650,000)	(5,503,289)	2,448,692	44,173,328
1997	15,267,182	0	51,788,497	(14,650,000)	(5,740,515)	1,699,730	48,364,894
1998	3,853,380	0	54,725,293	(14,650,000)	(8,155,000)	1,193,198	36,987,871
1999	7,472,272	0	56,456,653	(14,650,000)	(9,198,000)	9,686	40,090,611
2000	10,098,916	0	56,659,515	(14,688,338)	(10,297,482)	13,491	41,786,102
2001	10,289,829	0	76,067,203	(16,223,803)	(14,328,482)	23,866	55,828,612
2002	19,499,408	0	68,370,097	(19,498,891)	(20,828,580)	24,426	47,568,480
2003	22,829,024	0	78,596,866	(20,605,664)	(29,982,088)	9,833	50,847,971
2004	20,898,756	0	92,040,854	(17,530,688)	(35,845,422)	7,548	59,571,048
2005	5,905,145	0	104,169,572	(15,354,462)	(22,004,805)	0	72,715,450
2006	10,783,911	0	102,069,228	(15,210,585)	(21,005,765)	0	76,636,790
2007	7,625,968	0	87,456,937	(14,734,855)	(16,759,447)	0	63,588,602
2008	5,926,449	0	103,581,715	(14,753,027)	(19,295,181)	0	75,459,955
2009	5,045,452	0	117,030,266	(15,984,557)	(20,877,805)	0	85,213,357
2010	4,314,003	0	120,144,983	(16,032,207)	(20,222,025)	0	88,204,754
2011	8,350,702	0	126,811,541	(16,032,123)	(19,207,013)	0	99,923,108
2012	16,182,478	0	131,942,711	(16,105,768)	(25,150,420)	0	106,869,001
2013	63,407,513	0	134,987,755	(16,107,742)	(22,045,481)	0	160,242,045
2014	45,665,016	0	135,558,984	(16,109,005)	(22,596,619)	0	142,518,371
2015	21,987,838	0	135,791,905	(16,113,694)	(23,161,534)	0	118,504,515
2016	9,704,374	0	127,791,552	(16,111,715)	(22,827,223)	0	98,486,988
2017	2,387,337	0	136,858,863	(16,111,091)	(23,055,496)	0	100,079,613
2018	1,751,902	0	116,744,600	(16,109,338)	(23,286,051)	0	79,101,113
2019	399,502	0	132,499,999	(16,108,337)	(23,518,911)	0	93,272,253
2020	399,502	0	126,210,792	(16,111,940)	(23,754,100)	0	86,744,254
2021	399,502	0	130,478,749	(16,115,372)	(23,991,641)	0	90,771,238
2022	399,502	0	111,340,835	(16,113,270)	(24,231,558)	0	71,395,509
2023	399,502	0	122,281,096	(16,116,357)	(24,473,873)	0	82,090,368
2024	399,502	0	118,075,467	(16,109,172)	(24,718,612)	0	77,647,185
2025	399,502	0	114,664,736	(16,116,776)	(24,965,798)	0	73,981,664
2026	399,502	0	125,747,360	(16,109,757)	(25,215,456)	0	84,821,649
2027	399,502	0	114,459,743	(16,107,365)	(25,467,611)	0	73,284,269
2028	399,502	0	121,904,600	(16,114,795)	(25,722,287)	0	80,467,220
2029	399,502	0	134,499,156	(16,112,232)	(25,979,510)	0	92,806,916
2030	399,502	0	119,783,888	(14,731,995)	(26,239,305)	0	79,212,090
2031	399,502	0	124,405,553	(14,733,966)	(26,501,698)	0	83,569,391
2032	399,502	0	131,938,924	(14,730,617)	(26,765,715)	0	90,841,084
2033	399,502	0	130,834,737	(14,732,267)	(27,034,382)	0	89,467,590
2034	399,502	0	128,653,683	(14,733,652)	(27,304,726)	0	87,014,807
2035	399,502	0	128,188,240	(14,729,780)	(27,577,773)	0	86,280,189
TOTAL	1,279,842,255	(11,528,320)	4,946,520,085	(1,049,858,204)	(1,004,693,598)	57,085,905	4,217,368,124

- (a) Reimbursed through the capital cost component of the Delta Water Charge.
- (b) Negotiated settlements as to the magnitude of SWP planning costs from 1952 through 1978.
- (c) Reimbursed through the minimum OMP&R component of the Delta Water Charge. Credits for Gianelli power generation are reflected in these net costs.
- (d) Revenues credited through the capital cost component of the Delta Water Charge.
- (e) Revenues credited through the minimum OMP&R component of the Delta Water Charge.
- (f) Under amendments of Articles 22(e) and 22(g), planning and pre-operating costs of additional Project Conservation Facilities incurred through 2012 reflected in the Delta Water Charge.

## Tables B-14 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA (a)	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1952	0	0	0	83	114	410	608	122	224	346
1953	0	0	0	323	479	1,808	2,610	336	620	956
1954	0	0	0	819	1,306	5,150	7,275	421	777	1,199
1955	0	0	0	977	1,570	6,297	8,844	211	390	601
1956	0	0	0	8,844	14,459	63,816	87,120	227	418	645
1957	15,199	11,436	26,634	21,564	35,240	649,596	706,401	291	536	827
1958	33,420	16,591	50,011	67,764	71,717	733,414	872,896	720	1,328	2,048
1959	20,697	6,591	27,288	154,255	143,730	493,050	791,035	10,636	69,139	79,775
1960	9,097	8,830	17,927	296,492	275,610	1,018,661	1,590,763	15,255	99,794	115,048
1961	6,950	7,445	14,395	853,506	802,675	1,914,709	3,570,890	10,163	36,681	46,843
1962	(194)	(926)	(1,120)	545,123	615,141	1,686,041	2,846,306	17,281	39,570	56,851
1963	1,319	1,111	2,430	657,426	1,281,271	3,243,838	5,182,534	68,821	140,841	209,662
1964	38,393	35,466	73,859	712,650	1,747,783	7,251,800	9,712,233	138,614	282,003	420,617
1965	198,833	62,221	261,054	360,779	606,025	3,414,457	4,381,262	250,706	497,152	747,859
1966	461,619	49,917	511,536	592,714	592,598	2,245,215	3,430,528	587,951	1,117,486	1,705,437
1967	1,569,498	40,379	1,609,877	796,995	803,951	2,401,862	4,002,808	936,412	1,762,694	2,699,106
1968	859,613	61,691	921,304	736,470	696,075	1,997,924	3,430,469	351,131	675,220	1,026,351
1969	74,388	59,318	133,706	269,698	293,275	764,950	1,327,923	76,966	164,583	241,550
1970	43,361	67,877	111,238	58,676	61,200	135,569	255,445	47,891	109,224	157,115
1971	26,763	34,052	60,815	12,086	18,227	84,089	114,402	28,638	80,715	109,353
1972	19,643	18,905	38,548	12,293	12,763	63,610	88,666	19,289	50,230	69,519
1973	56,510	30,874	87,384	10,494	12,136	39,380	62,010	23,010	56,178	79,189
1974	165,830	65,832	231,662	15,722	24,402	73,119	113,243	25,037	61,383	86,420
1975	91,824	89,234	181,058	16,730	15,806	41,394	73,930	14,740	61,416	76,156
1976	57,765	83,651	141,416	34,004	34,663	109,610	178,277	33,638	130,440	164,078
1977	64,167	80,147	144,314	46,229	45,115	133,375	224,720	108,324	264,720	373,044
1978	69,319	81,717	151,036	71,234	66,008	174,898	312,140	21,415	80,822	125,237
1979	191,273	282,907	474,180	45,468	42,943	110,665	199,077	22,941	125,669	148,610
1980	264,433	386,006	650,439	134,522	124,352	304,614	563,488	103,258	462,895	566,154
1981	227,606	383,086	610,692	(33,738)	(29,856)	(65,637)	(129,231)	(15,416)	(135,240)	(150,656)
1982	549,164	870,611	1,419,775	7,876	8,321	27,065	43,262	4,102	(58,882)	(54,780)
1983	1,254,900	1,433,061	2,687,961	138,413	131,515	339,246	609,175	32,196	110,287	142,483
1984	2,547,878	2,750,040	5,297,918	152,992	140,971	351,921	645,884	35,448	107,723	143,171
1985	7,143,123	6,443,613	13,586,736	19,776	19,245	53,491	92,512	17,424	78,896	96,319
1986	10,565,937	16,926,630	27,492,567	32,034	31,581	88,070	151,684	44,135	306,452	350,588
1987	7,979,832	12,599,507	20,579,339	50,153	48,675	138,959	237,787	126,995	1,342,116	1,469,110
1988	2,312,909	4,343,513	6,656,422	116,181	112,294	302,461	530,935	156,473	1,479,545	1,636,018
1989	1,224,538	1,553,352	2,777,890	108,320	102,804	260,092	471,217	152,173	1,210,940	1,363,112
1990	443,002	824,055	1,267,057	224,283	224,188	625,213	1,073,684	222,208	1,559,457	1,781,665
1991	99,848	89,269	189,117	413,426	383,368	946,246	1,743,040	298,398	2,184,088	2,482,487
1992	57,045	62,083	119,128	182,231	169,968	442,055	794,255	361,210	3,504,755	3,865,965
1993	122,423	128,634	251,057	129,344	125,312	342,416	597,071	1,170,649	11,997,953	13,168,602
1994	71,274	83,270	154,544	46,042	58,050	229,649	333,741	4,260,734	46,401,596	50,662,331
1995	30,605	29,271	59,876	97,808	97,063	257,484	452,355	12,268,787	155,255,850	167,524,637
1996	20,275	19,069	39,344	49,854	48,056	127,493	225,403	11,284,548	145,409,410	156,693,959
1997	20,039	107,784	127,823	82,598	78,996	209,517	371,111	3,184,506	38,158,718	41,343,224
1998	17,423	21,572	38,995	27,302	24,121	63,057	114,480	883,110	10,563,359	11,446,469
1999	67,602	106,355	173,957	74,165	73,552	208,296	356,013	928,738	9,596,058	10,524,796
2000	16,252	37,932	54,185	27,445	28,844	80,346	136,635	488,160	5,529,102	6,017,261
2001	6,598	13,750	20,347	140,394	270,055	1,856,845	2,267,294	72,358	539,206	611,564
2002	19,917	45,940	65,857	805,478	1,189,615	5,876,842	7,871,934	63,183	376,338	439,521
2003	54,235	20,712	74,947	1,156,874	1,331,274	4,619,175	7,107,323	(2,583)	77,174	74,591
2004	153,240	20,534	173,774	360,395	346,064	4,106,508	4,812,967	8,906	46,169	55,074
2005	60,543	62,997	123,541	358,153	339,995	1,541,971	2,240,119	(10,551)	(177,303)	(187,854)
2006	887,961	20,258	908,219	711,377	660,630	1,589,731	2,961,738	5,984	60,533	66,517
2007	3,237,280	43,244	3,280,524	715,234	661,058	1,586,475	2,962,767	14,376	80,691	95,067
2008	7,903,072	61,968	7,965,040	1,314,460	1,213,310	2,904,291	5,432,061	20,582	84,897	105,479
2009	1,197,373	20,419	1,217,792	2,754,599	2,576,522	6,144,919	11,476,041	8,093	73,241	81,333
2010	397,066	4,083	401,149	3,666,012	3,334,569	8,364,010	15,364,591	75,323	140,003	215,326
2011	155,151	16,415	171,566	3,813,699	3,615,739	8,715,989	16,145,427	97,865	185,273	283,138
2012	344,257	302,679	646,936	2,276,016	2,202,922	5,621,242	10,100,180	41,311	183,535	224,846
2013	384,267	413,734	798,001	872,396	885,251	2,297,554	4,055,200	554,109	2,002,096	2,556,205
2014	<b>287,640</b>	<b>275,257</b>	<b>562,897</b>	<b>142,945</b>	<b>163,080</b>	<b>453,584</b>	<b>759,609</b>	<b>170,059</b>	<b>566,170</b>	<b>736,229</b>
2015	263,188	236,812	500,000	70,676	85,889	247,096	403,660	64,206	284,526	348,732
2016	25,793	23,207	49,000	1,273	1,164	2,773	5,209	5,780	26,939	32,719
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
TOTAL	54,488,975	51,975,987	106,464,962	27,640,427	29,194,838	90,119,768	146,955,034	40,008,021	445,547,816	485,555,838

Note: Allocated capital costs as a result of permanent water transfers under Monterey are not reflected on this Table.

(a) Costs from Table B-10 allocated to Solano County Water Agency are reduced herein by \$2,102,700 in 1986 and \$1,823,500 in 1987 under provisions of Amendment No. 10 to its water supply contract.

**TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District (b)	Future Contractor San Joaquin Valley	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Municipal and (c) Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
1952	389	20	58	938	119	9,129	20	12	785	11,470
1953	1,076	53	161	2,887	345	27,383	55	33	2,157	34,150
1954	1,350	68	201	3,373	417	32,369	69	43	2,718	40,608
1955	677	34	101	1,497	197	14,721	35	23	1,371	18,656
1956	726	34	108	2,702	273	24,255	35	25	1,416	29,575
1957	932	38	139	6,048	494	49,932	39	29	1,707	59,359
1958	2,308	102	344	14,374	1,153	119,049	104	61	4,368	141,862
1959	7,384	364	2,517	26,218	2,597	253,891	372	381	14,757	308,481
1960	12,940	630	3,666	34,054	4,155	352,166	644	498	25,696	434,448
1961	21,848	1,063	3,954	51,407	6,500	538,707	1,087	598	43,377	668,542
1962	49,320	2,410	7,867	94,933	13,834	1,017,146	2,465	1,879	98,141	1,287,996
1963	208,757	10,687	32,172	364,014	55,715	3,934,636	10,932	5,990	425,330	5,048,232
1964	328,286	16,961	64,890	600,152	88,904	6,636,279	17,350	11,942	672,013	8,436,776
1965	538,215	27,481	117,996	1,098,999	152,930	11,999,892	28,116	21,802	1,095,126	15,080,557
1966	1,107,757	52,586	279,172	2,218,832	339,222	24,857,487	53,789	38,891	2,173,090	31,120,826
1967	852,537	39,537	445,562	2,012,744	286,990	23,629,026	40,444	34,775	1,653,429	28,995,045
1968	198,739	9,739	166,267	1,104,132	70,086	11,544,942	9,962	12,238	396,075	13,512,180
1969	94,436	4,793	35,473	616,516	27,216	6,416,147	4,903	7,302	191,574	7,398,361
1970	54,344	2,720	21,686	414,659	15,520	4,145,046	2,782	3,999	109,470	4,770,226
1971	25,462	1,291	12,094	190,552	7,114	1,622,274	1,320	540	51,618	1,912,264
1972	11,589	589	8,354	82,886	3,409	723,623	602	343	23,526	854,921
1973	6,657	335	10,201	39,973	1,980	458,527	343	221	13,448	531,685
1974	9,478	469	11,044	45,420	2,766	483,866	479	326	18,979	572,828
1975	13,329	677	5,246	36,467	3,710	382,743	692	425	27,048	470,338
1976	17,506	837	12,615	53,085	5,621	654,026	856	1,152	34,455	780,152
1977	9,672	436	47,790	36,478	3,753	886,672	446	494	18,497	1,004,236
1978	23,499	(30,406)	6,178	54,219	6,579	575,169	1,209	1,402	47,446	685,296
1979	25,051	1,295	5,664	53,866	6,610	559,746	1,325	1,862	51,293	706,711
1980	144,980	(4,617)	31,160	321,890	38,126	3,211,810	7,682	7,144	297,215	4,055,391
1981	(5,427)	(15,464)	200	(44,773)	(1,223)	(385,275)	(296)	1,752	(11,324)	(461,830)
1982	49,916	2,584	6,600	83,283	13,142	654,692	2,638	1,252	102,287	916,395
1983	52,429	(35,295)	12,125	110,465	13,872	1,073,500	2,769	1,327	1,337,372	1,338,529
1984	86,345	4,474	14,303	154,799	22,764	1,617,225	4,572	2,678	177,020	2,084,180
1985	25,435	1,311	5,649	47,055	6,766	484,485	1,341	1,176	52,013	625,231
1986	38,309	(41,067)	9,862	71,661	10,320	796,097	2,009	778	78,142	966,110
1987	28,769	1,476	7,004	55,537	7,969	616,845	1,509	1,491	58,679	779,279
1988	52,329	2,831	17,078	70,572	12,049	909,046	2,894	4,620	109,713	1,181,132
1989	156,099	8,019	27,551	352,103	42,943	3,834,481	8,201	12,134	318,604	4,760,133
1990	292,361	15,142	50,360	553,394	87,199	6,094,021	15,487	22,729	599,233	7,729,927
1991	349,413	18,103	60,419	580,572	91,765	6,447,565	18,515	23,486	716,292	8,306,130
1992	125,891	6,439	28,019	241,559	34,559	2,711,639	6,585	10,883	256,370	3,421,943
1993	86,113	4,375	30,245	174,630	23,840	2,059,168	4,474	4,698	174,772	2,562,314
1994	64,762	3,323	23,894	124,518	17,633	1,488,418	3,398	2,173	132,095	1,860,213
1995	82,969	(1,000)	72,734	167,698	24,390	2,472,332	4,355	2,824	169,318	2,995,621
1996	27,611	(61,913)	51,990	68,870	8,812	1,233,548	1,437	1,590	56,092	1,388,037
1997	136,503	7,041	48,721	241,400	36,417	2,951,687	7,195	3,706	279,205	3,711,875
1998	70,737	(121,004)	23,083	122,934	18,622	1,474,568	3,742	1,278	144,963	1,738,923
1999	81,197	4,192	26,645	142,983	21,661	1,715,933	4,285	3,846	166,160	2,166,903
2000	21,089	1,073	9,822	45,704	6,013	547,927	1,096	(1,081)	42,826	674,466
2001	17,776	907	7,862	36,078	5,062	432,671	927	781	36,153	538,217
2002	74,205	3,811	16,014	132,974	20,050	1,498,693	3,898	727	151,445	1,901,817
2003	(51,255)	(2,679)	(5,522)	(76,239)	(13,107)	(824,213)	(2,740)	337	(105,557)	(1,080,975)
2004	7,704	394	2,497	17,036	2,079	183,122	404	1,518	15,697	230,453
2005	28,573	1,473	5,736	52,697	7,564	539,512	1,505	561	58,418	696,039
2006	2,796	142	775	17,482	758	58,084	146	553	5,681	86,418
2007	9,213	458	3,265	26,805	2,610	217,561	468	601	18,485	279,466
2008	37,255	1,922	7,631	63,716	9,847	705,323	1,964	1,353	76,209	905,219
2009	12,954	657	2,914	45,028	3,535	266,406	672	785	26,274	359,225
2010	25,920	1,344	35,841	65,589	6,780	825,513	1,375	178	53,163	1,015,703
2011	26,317	1,365	46,735	53,156	6,884	956,210	1,396	454	53,976	1,146,491
2012	20,084	995	12,573	43,466	5,721	545,986	1,017	1,117	40,239	671,198
2013	232,088	11,924	198,556	419,109	61,948	6,432,556	12,194	15,819	473,743	7,857,938
2014	224,471	11,568	378,754	59,441	4,472,493	11,833	8,145	458,905	5,689,777	8,589,777
2015	39,970	2,029	19,432	77,682	10,887	937,034	2,075	1,737	81,094	1,171,940
2016	2,277	118	1,660	3,655	594	55,293	121	223	4,672	68,613
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>6,302,440</b>	<b>(18,707)</b>	<b>2,279,118</b>	<b>14,305,268</b>	<b>1,836,500</b>	<b>161,260,808</b>	<b>321,617</b>	<b>292,660</b>	<b>12,674,522</b>	<b>199,254,225</b>

(b) Costs from Table B-10 allocated to Empire West Side Irrigation District are reduced herein by \$31,588 in 1978; \$12,129 in 1980; \$15,173 in 1981; \$38,004 in 1983; \$43,033 in 1986; \$5,261 in 1995; \$63,318 in 1996 and \$124,667 in 1998 in accordance with letters of agreement with the district.

(c) Costs related to maximum annual Table A of 15,000 acre-feet under Amendment No. 18 of the water supply contract with Kern County Water Agency.



**TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency (d)	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]
1952	3,158	1,042	850	254	1,402	70	1,695	418	6,079	1,550
1953	10,026	3,327	2,668	799	4,401	222	5,318	1,328	19,058	4,852
1954	12,742	4,193	3,465	1,031	5,714	285	6,908	1,691	24,608	6,290
1955	5,411	1,881	1,374	401	2,267	115	2,756	715	9,229	2,377
1956	9,775	3,590	2,196	612	3,622	191	4,449	1,267	13,138	3,438
1957	26,306	9,255	6,343	1,816	10,461	540	12,767	3,450	40,646	10,534
1958	49,204	17,589	11,581	3,290	19,099	991	23,360	6,414	72,708	18,898
1959	70,247	29,740	15,869	4,616	26,171	1,347	31,759	9,030	98,596	25,519
1960	84,552	38,760	22,068	6,797	36,395	1,547	43,260	10,772	147,170	37,469
1961	126,542	54,262	34,613	12,530	57,086	2,245	63,709	16,437	236,164	57,707
1962	198,558	85,352	43,719	13,861	72,102	3,344	84,709	24,943	253,435	64,330
1963	580,138	255,252	116,797	33,149	192,624	9,828	234,926	73,256	610,277	160,624
1964	1,094,365	501,858	209,462	55,445	345,446	18,442	429,605	137,769	1,026,066	276,118
1965	1,908,076	947,523	385,533	103,757	635,825	32,819	786,986	244,587	1,913,090	512,862
1966	3,960,302	2,150,972	812,655	215,858	1,340,235	69,325	1,664,584	517,269	3,943,586	1,062,417
1967	4,976,538	4,100,531	1,077,422	298,009	1,776,892	88,301	2,182,240	653,250	5,821,681	1,550,239
1968	5,924,474	3,998,942	1,350,742	368,156	2,227,646	107,350	2,738,009	783,940	7,982,824	2,122,940
1969	5,822,708	3,079,426	1,690,259	539,851	2,787,631	121,303	3,256,507	865,455	10,988,185	2,769,647
1970	5,032,959	3,277,778	2,050,788	695,345	3,382,251	106,381	3,872,367	736,775	13,795,809	3,457,109
1971	2,577,507	2,146,954	1,071,523	338,581	1,767,179	48,337	2,087,223	347,057	8,137,053	1,987,120
1972	973,436	283,257	331,759	92,079	547,138	19,134	668,550	134,360	2,691,137	697,957
1973	354,407	914,303	158,579	82,223	261,557	6,304	238,094	46,102	1,760,570	403,582
1974	451,450	280,861	259,175	74,113	427,433	8,143	518,453	59,145	1,617,394	425,927
1975	253,438	246,492	193,632	52,821	319,337	4,954	392,110	33,995	1,533,664	407,913
1976	237,539	255,238	136,751	37,235	225,529	4,245	277,807	31,002	962,280	255,901
1977	199,554	371,469	91,384	25,858	150,711	3,757	183,609	28,834	591,445	153,537
1978	302,111	470,176	78,573	22,226	129,584	5,233	157,815	38,654	428,989	111,769
1979	357,678	938,985	81,807	21,795	134,915	5,965	166,931	44,410	403,569	108,408
1980	1,867,517	1,777,294	423,755	113,166	698,855	32,435	864,104	240,899	2,040,757	548,085
1981	(158,728)	610,795	(47,102)	(8,865)	(77,678)	(2,576)	(102,568)	(19,588)	(143,875)	(43,557)
1982	1,557,934	861,928	298,770	78,903	492,728	26,237	613,587	196,672	1,421,407	388,261
1983	2,062,512	521,349	396,033	115,678	653,134	34,699	803,945	259,939	2,126,313	581,672
1984	1,518,361	295,783	297,559	85,097	490,731	27,272	606,124	188,562	1,546,628	423,408
1985	896,226	158,810	217,115	62,532	358,064	13,104	441,299	107,533	1,116,949	305,291
1986	841,555	104,860	221,194	58,152	364,790	9,038	454,702	93,309	1,048,625	286,302
1987	333,052	105,625	166,099	43,992	273,928	5,566	340,485	40,716	783,725	213,202
1988	259,234	174,155	65,931	22,723	108,570	3,394	128,339	26,743	429,498	113,644
1989	1,045,999	434,394	323,138	97,036	532,920	16,777	649,616	125,344	1,375,722	372,048
1990	678,053	374,313	332,566	97,789	548,468	7,335	672,344	67,179	1,509,745	409,710
1991	831,687	401,961	367,196	120,925	605,579	11,966	733,443	92,625	1,979,364	540,210
1992	633,272	356,952	270,826	131,328	446,647	9,556	501,634	76,760	2,093,387	573,386
1993	634,283	332,089	222,347	171,095	366,700	10,194	353,470	73,955	3,848,084	1,046,752
1994	467,409	165,607	132,599	93,839	218,685	7,255	218,494	53,209	2,347,599	637,733
1995	459,990	293,308	132,690	78,390	218,835	7,436	232,377	54,544	1,960,100	530,656
1996	299,764	206,742	110,520	44,965	182,270	4,885	211,872	35,808	4,024,655	972,829
1997	438,898	249,699	103,382	24,640	170,497	7,397	214,534	54,452	2,892,626	397,103
1998	234,379	202,650	62,492	41,136	103,063	3,989	106,009	29,551	3,683,357	303,255
1999	268,224	175,939	89,312	40,069	147,294	4,812	167,592	35,399	5,733,587	235,054
2000	139,035	77,889	54,795	23,903	90,369	2,665	103,194	19,150	14,346,200	171,107
2001	130,754	44,790	50,816	15,641	83,805	2,989	102,254	20,949	20,292,396	96,254
2002	167,056	107,515	34,405	11,395	56,741	2,453	68,208	18,551	9,841,902	126,427
2003	(45,784)	(11,499)	2,940	2,123	4,849	(803)	4,179	(5,961)	3,944,702	27,216
2004	63,046	38,831	20,124	5,569	33,188	1,133	41,043	8,244	2,148,312	38,381
2005	185,058	105,447	38,609	11,966	63,674	3,220	76,154	23,692	990,923	61,078
2006	320,892	240,802	65,892	24,565	108,672	5,400	121,887	40,415	2,027,154	110,707
2007	248,491	177,829	55,899	21,595	92,189	4,393	107,875	32,061	2,126,689	106,321
2008	115,672	156,501	63,067	58,916	104,025	2,066	66,877	15,021	3,335,814	254,281
2009	574,764	338,277	153,096	60,222	252,497	9,781	274,446	72,787	4,777,844	270,948
2010	642,753	339,864	193,366	62,727	318,906	10,775	370,288	80,800	5,462,477	285,354
2011	312,914	204,142	225,295	58,001	371,553	5,256	463,435	39,373	6,451,570	280,991
2012	145,187	88,778	317,880	81,188	524,243	2,963	655,950	20,171	12,109,089	409,806
2013	748,782	558,861	195,435	67,895	322,311	13,418	388,411	97,266	1,822,180	429,991
2014	<b>519,726</b>	<b>260,432</b>	<b>124,382</b>	<b>33,824</b>	<b>205,131</b>	<b>9,677</b>	<b>256,156</b>	<b>68,831</b>	<b>1,349,819</b>	<b>361,210</b>
2015	240,119	148,984	57,953	16,263	95,576	4,539	118,505	32,047	672,399	181,867
2016	3,918	54,546	704	178	1,162	66	1,468	492	3,150	867
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>55,285,207</b>	<b>35,205,257</b>	<b>16,082,568</b>	<b>5,169,130</b>	<b>26,523,621</b>	<b>991,468</b>	<b>31,568,237</b>	<b>7,267,825</b>	<b>198,559,317</b>	<b>28,746,884</b>

(d) Costs from Table B-10 allocated to Castaic Lake Water Agency are reduced herein by \$14,088 in 1978 in accordance with a letter of agreement with the district.

**TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California (e)	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1952	962	69,020	370	86,871	0	0	0	0	59	99,353
1953	3,011	217,634	1,187	273,833	0	0	0	0	264	311,812
1954	3,904	279,967	1,496	352,294	0	0	0	0	766	402,143
1955	1,474	111,602	670	140,272	0	0	0	0	969	169,342
1956	2,127	179,335	1,299	225,040	0	0	0	0	9,172	351,551
1957	6,526	516,050	3,367	648,059	0	0	0	0	23,172	1,484,452
1958	11,701	945,684	6,390	1,186,917	0	0	0	0	32,888	2,286,623
1959	15,815	1,364,298	9,894	1,702,901	0	0	14	14	57,918	2,967,412
1960	23,307	1,914,521	12,798	2,379,418	0	0	28	28	123,202	4,660,833
1961	36,153	3,212,125	18,770	3,928,343	0	0	10	10	316,220	8,545,244
1962	40,012	3,543,471	29,069	4,456,905	0	0	32	32	228,202	8,875,171
1963	99,266	11,185,928	86,807	13,638,873	0	0	51	51	528,496	24,610,278
1964	170,012	18,065,455	164,709	22,494,750	0	0	7,791	7,791	590,034	41,736,060
1965	316,082	33,763,577	307,475	41,858,192	0	0	3,139	3,139	332,680	62,664,743
1966	654,194	74,485,027	681,898	91,558,323	0	0	(48)	(48)	783,728	129,110,330
1967	958,406	130,599,417	1,279,076	155,360,062	0	0	47	47	1,479,421	194,146,365
1968	1,314,841	147,502,290	1,360,687	177,782,842	0	0	51,573	51,573	1,254,192	197,978,911
1969	1,726,891	140,096,646	1,085,026	174,739,535	0	0	234,232	234,232	398,183	184,473,490
1970	2,160,122	161,983,078	1,147,609	201,698,371	0	0	16,227	16,227	74,028	207,082,650
1971	1,237,573	133,903,316	738,822	156,388,246	0	0	27,204	27,204	12,457	158,624,739
1972	434,507	43,931,880	66,878	50,872,072	0	0	9	9	13,182	51,936,917
1973	256,711	39,723,010	290,020	44,495,462	0	0	25	25	8,099	45,263,853
1974	264,349	18,896,593	86,362	23,369,399	0	0	45	45	28,570	24,402,166
1975	253,838	16,732,939	83,975	20,509,109	0	0	21	21	8,226	21,318,838
1976	158,850	13,545,451	84,623	16,212,450	0	0	51	51	16,486	17,492,910
1977	96,517	11,769,352	110,833	13,776,859	0	0	28	28	21,181	15,544,382
1978	69,152	15,781,696	174,876	17,770,853	0	0	38	38	28,876	19,073,475
1979	66,847	27,627,424	343,361	30,302,093	0	0	23	23	26,668	31,857,362
1980	337,811	59,493,774	641,586	69,080,039	0	0	26	26	59,169	74,974,704
1981	(26,356)	15,661,179	224,257	15,865,338	0	0	34	34	(6,746)	15,727,602
1982	238,792	30,873,857	316,107	37,365,183	0	0	11	11	16,086	39,705,931
1983	357,812	25,056,047	187,121	33,156,253	0	0	19	19	72,225	38,006,645
1984	260,327	16,317,441	103,160	22,160,455	0	0	26	26	83,252	30,414,886
1985	187,699	10,243,779	56,162	14,164,564	0	0	29	29	16,338	28,581,730
1986	176,057	8,365,310	34,777	12,058,671	0	0	31	31	16,248	41,035,899
1987	131,163	6,955,356	36,142	9,429,050	0	0	32	32	29,062	32,523,660
1988	70,260	6,626,545	57,117	8,086,041	0	0	55	55	50,083	18,140,686
1989	227,772	18,531,680	153,200	23,885,645	0	0	44	44	43,324	33,301,366
1990	251,185	17,430,869	125,376	22,504,929	0	0	63	63	96,419	34,453,743
1991	331,235	20,792,168	132,558	26,940,915	0	0	54	54	149,922	39,811,664
1992	351,492	21,196,762	116,999	26,758,999	0	0	42	42	80,900	35,041,233
1993	646,980	29,471,748	105,693	37,283,389	0	0	30	30	59,324	53,921,787
1994	394,936	16,392,019	50,941	21,180,326	0	0	14	14	34,208	74,225,377
1995	331,286	16,078,395	72,214	20,450,221	0	0	3	3	42,395	191,525,108
1996	1,079,629	23,237,696	49,282	30,460,917	0	0	0	0	21,388	188,829,048
1997	1,914,804	13,530,777	72,335	20,071,144	0	0	3	3	34,976	65,660,155
1998	3,219,136	11,284,364	65,745	19,339,120	0	0	7	7	11,234	32,689,229
1999	5,888,075	9,063,618	54,504	21,903,479	0	0	2	2	34,616	35,159,766
2000	16,301,847	5,393,221	24,010	36,747,384	0	0	24	24	16,912	43,646,866
2001	23,613,431	2,988,800	13,047	47,455,926	0	0	20	20	68,013	50,961,381
2002	11,145,574	5,297,703	34,824	26,912,753	0	0	14	14	380,629	37,572,525
2003	4,489,333	3,954,532	(4,182)	12,361,646	0	0	0	0	590,121	19,127,653
2004	2,289,248	4,276,877	13,219	8,977,217	0	0	0	0	156,413	14,405,899
2005	809,998	6,615,802	36,038	9,021,661	0	0	0	0	123,949	12,017,455
2006	1,803,792	13,692,537	88,228	18,650,943	0	0	5	5	240,447	22,914,286
2007	2,114,612	11,569,694	63,926	16,721,573	0	0	0	0	240,866	23,580,263
2008	2,801,735	11,237,865	54,154	18,265,994	0	0	4	4	442,647	33,116,444
2009	4,252,878	22,068,434	121,873	33,227,849	0	0	13	13	938,370	47,300,623
2010	5,295,231	18,029,798	107,155	31,199,494	0	0	0	0	6,290,391	54,486,654
2011	6,506,238	12,296,215	51,517	27,266,500	0	0	1	1	2,486,456	47,499,580
2012	12,624,215	15,521,343	26,914	42,527,726	0	0	0	0	839,604	55,010,492
2013	304,981	31,345,859	111,515	36,406,904	0	0	0	0	350,369	52,024,618
2014	<b>243,540</b>	<b>48,025,785</b>	<b>73,365</b>	<b>51,531,877</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>68,828</b>	<b>59,349,217</b>
2015	113,374	60,644,428	46,520	62,372,574	0	0	0	0	34,384	64,831,290
2016	531	33,047,775	19,356	33,134,212	0	0	0	0	457	33,290,210
2017	0	6,881,028	0	6,881,028	0	0	0	0	0	6,881,028
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>121,463,802</b>	<b>1,741,437,865</b>	<b>11,715,103</b>	<b>2,280,016,282</b>	<b>0</b>	<b>0</b>	<b>341,149</b>	<b>341,149</b>	<b>20,610,618</b>	<b>3,239,198,107</b>

(e) Costs from Table B-10 allocated to MWDSC are reduced herein by \$16,425,374 in 1972 under provisions of Amendment No. 7 to its water contract.

**TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor<sup>a b c</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	153,778	105,673	364,827	624,278	0	0	0
1964	0	0	0	216,203	170,929	530,036	917,168	6,696	21,667	28,363
1965	0	0	0	284,369	259,943	899,371	1,443,684	13,756	36,029	49,785
1966	18,063	0	18,063	320,384	290,808	1,073,270	1,684,462	26,524	61,349	87,873
1967	41,574	0	41,574	391,262	320,989	1,187,619	1,899,870	56,469	118,263	174,731
1968	121,509	0	121,509	507,862	361,935	1,309,946	2,179,743	104,160	208,037	312,197
1969	165,289	0	165,289	610,063	397,386	1,411,701	2,419,150	122,043	242,426	364,469
1970	169,077	0	169,077	644,413	412,322	1,450,660	2,507,395	125,963	250,808	376,771
1971	171,286	0	171,286	651,275	415,439	1,457,564	2,524,278	128,402	256,371	384,773
1972	172,649	0	172,649	652,670	416,368	1,461,847	2,530,884	129,861	260,482	390,343
1973	173,649	31,366	205,015	654,041	417,018	1,465,086	2,536,145	130,843	263,040	393,883
1974	176,527	32,938	209,466	655,060	417,636	1,467,992	2,539,787	132,015	265,901	397,916
1975	184,973	36,291	221,264	657,422	418,879	1,470,816	2,547,116	133,290	269,028	402,318
1976	189,650	40,836	230,485	658,774	419,684	1,472,924	2,551,381	134,041	272,155	406,196
1977	192,592	45,096	237,688	661,476	421,449	1,478,507	2,561,431	135,754	278,799	414,553
1978	195,860	49,178	245,038	665,100	423,747	1,485,299	2,574,146	141,271	292,281	433,552
1979	199,390	53,340	252,730	670,444	427,108	1,494,207	2,591,760	142,362	297,589	439,930
1980	209,132	67,748	276,880	674,280	429,296	1,499,843	2,603,418	143,530	303,969	447,499
1981	222,599	87,408	310,007	684,481	435,629	1,515,357	2,635,467	148,789	327,544	476,333
1982	234,191	106,918	341,110	682,409	434,108	1,512,014	2,628,532	148,004	320,657	468,660
1983	262,160	151,259	413,419	683,704	434,532	1,513,393	2,631,628	148,213	317,658	465,870
1984	326,072	224,245	550,317	694,833	441,230	1,530,671	2,666,734	149,853	323,275	473,127
1985	455,836	364,305	820,141	707,296	448,410	1,548,594	2,704,300	151,658	328,761	480,419
1986	819,636	692,479	1,512,115	709,236	449,390	1,551,318	2,709,945	152,545	332,779	485,324
1987	1,360,688	1,559,243	2,919,931	711,863	451,007	1,555,828	2,718,699	154,805	348,472	503,277
1988	1,771,651	2,208,121	3,979,772	716,125	453,514	1,562,985	2,732,624	161,346	417,591	578,937
1989	1,891,484	2,433,160	4,324,645	725,043	459,332	1,578,655	2,763,030	169,453	494,247	663,699
1990	1,955,330	2,514,151	4,469,481	733,126	464,692	1,592,216	2,790,034	177,387	557,384	734,771
1991	1,978,582	2,557,403	4,535,985	750,234	476,459	1,625,032	2,851,725	189,050	639,235	828,285
1992	1,983,860	2,562,121	4,545,981	750,833	496,722	1,675,047	2,952,602	204,822	754,678	959,500
1993	1,986,897	2,565,427	4,552,324	795,192	505,773	1,698,585	2,999,551	224,056	941,300	1,165,356
1994	1,993,467	2,572,330	4,565,797	805,623	512,498	1,716,961	3,035,082	286,878	1,585,162	1,872,040
1995	1,997,323	2,576,836	4,574,159	810,099	515,639	1,729,387	3,055,124	517,412	4,095,799	4,613,211
1996	1,998,994	2,578,433	4,577,427	818,003	520,936	1,743,439	3,082,379	1,187,010	12,569,247	13,756,257
1997	2,000,110	2,579,484	4,579,594	822,053	523,583	1,750,461	3,096,097	1,808,545	20,578,178	22,386,724
1998	2,001,225	2,585,478	4,586,703	828,783	527,976	1,762,113	3,118,873	1,985,644	22,700,288	24,685,933
1999	2,002,204	2,586,690	4,588,893	831,012	529,331	1,765,656	3,125,999	2,035,260	23,293,767	25,329,027
2000	2,006,043	2,592,730	4,598,773	989,998	533,508	1,777,485	3,300,992	2,088,005	23,838,744	25,926,748
2001	2,325,936	2,781,545	5,107,481	1,122,974	535,165	1,782,101	3,440,240	2,116,046	24,156,352	26,272,398
2002	2,326,375	2,782,385	5,108,760	1,137,376	550,866	1,890,059	3,578,301	2,120,253	24,187,720	26,307,955
2003	2,327,719	2,785,194	5,112,914	1,222,077	620,921	2,236,139	4,079,137	2,123,974	24,209,864	26,333,838
2004	2,331,403	2,786,488	5,117,891	1,355,707	700,388	2,511,867	4,567,962	2,123,820	24,214,471	26,338,291
2005	2,341,951	2,787,826	5,129,777	1,392,500	721,344	2,760,543	4,874,387	2,124,359	24,217,267	26,341,626
2006	2,346,203	2,792,059	5,138,261	1,428,017	742,250	2,855,355	5,025,622	2,123,710	24,206,365	26,330,075
2007	2,409,243	2,793,440	5,202,684	1,499,187	783,535	2,954,702	5,237,424	2,124,084	24,210,148	26,334,232
2008	2,643,061	2,796,445	5,439,506	1,571,815	825,565	3,055,571	5,452,952	2,124,998	24,215,278	26,340,276
2009	3,224,438	2,800,776	6,025,214	1,707,774	904,139	3,243,653	5,855,566	2,126,331	24,220,776	26,347,107
2010	3,314,268	2,802,244	6,116,512	1,999,865	1,074,294	3,649,468	6,723,627	2,126,866	24,225,613	26,352,478
2011	3,344,685	2,802,542	6,147,227	2,698,173	1,299,165	4,213,505	8,210,843	2,131,945	24,235,054	26,366,999
2012	3,356,844	2,803,724	6,160,568	3,194,621	1,548,509	4,814,565	9,557,694	2,138,694	24,247,831	26,386,524
2013	3,384,587	2,826,969	6,211,556	3,282,515	1,598,429	4,846,770	9,727,714	2,141,612	24,260,794	26,402,405
2014	<b>3,416,383</b>	<b>2,859,386</b>	<b>6,275,769</b>	<b>3,317,967</b>	<b>1,597,325</b>	<b>4,848,057</b>	<b>9,763,349</b>	<b>2,175,070</b>	<b>24,384,212</b>	<b>26,559,283</b>
2015	3,440,841	2,881,716	6,322,557	3,261,133	1,520,459	4,512,511	9,294,102	2,180,679	24,412,225	26,592,704
2016	3,443,319	2,901,576	6,344,895	3,231,494	1,496,184	4,357,573	9,085,252	2,172,837	24,408,539	26,581,376
2017	3,418,930	2,903,586	6,322,516	3,157,041	1,466,096	4,243,444	8,866,580	2,143,351	24,353,760	26,497,110
2018	3,328,119	2,903,586	6,231,705	3,037,351	1,425,150	4,121,117	8,583,618	2,095,659	24,263,985	26,359,644
2019	3,278,369	2,903,586	6,181,955	2,931,829	1,389,699	4,019,362	8,340,890	2,077,776	24,229,596	26,307,372
2020	3,274,046	2,903,586	6,177,632	2,896,032	1,374,763	3,980,403	8,251,198	2,073,856	24,221,214	26,295,070
2021	3,271,514	2,903,586	6,175,100	2,888,834	1,371,646	3,973,499	8,233,978	2,071,417	24,215,651	26,287,068
2022	3,269,954	2,903,586	6,173,540	2,887,458	1,370,717	3,969,216	8,227,392	2,069,958	24,211,540	26,281,499
2023	3,268,811	2,870,053	6,138,864	2,886,049	1,370,067	3,965,976	8,222,093	2,068,976	24,208,982	26,277,958
2024	3,265,531	2,868,419	6,133,950	2,884,987	1,369,449	3,963,971	8,218,406	2,067,804	24,206,121	26,273,925
2025	3,255,915	2,864,842	6,120,758	2,882,651	1,368,206	3,960,247	8,211,104	2,066,529	24,202,995	26,269,524
2026	3,250,572	2,860,089	6,110,660	2,881,177	1,367,401	3,958,138	8,206,717	2,065,778	24,199,867	26,265,645
2027	3,247,200	2,855,654	6,102,854	2,878,190	1,365,636	3,952,556	8,196,382	2,064,065	24,193,224	26,257,289
2028	3,243,460	2,851,395	6,094,855	2,874,181	1,363,338	3,945,763	8,183,282	2,058,548	24,179,741	26,238,289
2029	3,239,423	2,847,027	6,086,450	2,868,183	1,359,977	3,936,856	8,165,015	2,057,457	24,174,454	26,231,911
2030	3,228,266	2,831,565	6,059,831	2,863,987	1,357,789	3,931,219	8,152,995	2,056,289	24,168,053	26,224,342
2031	3,212,850	2,810,498	6,023,348	2,852,504	1,351,456	3,915,705	8,119,666	2,051,030	24,144,478	26,195,508
2032	3,199,553	2,789,554	5,989,107	2,850,020	1,352,977	3,919,048	8,127,045	2,051,815	24,151,366	26,203,181
2033	3,167,493	2,742,103	5,909,596	2,853,779	1,352,553	3,917,670	8,124,002	2,051,606	24,154,365	26,205,971
2034	3,094,397	2,665,486	5,759,883	2,841,356	1,345,855	3,900,392	8,087,603	2,049,967	24,148,748	26,198,714
2035	2,946,254	2,519,184	5,465,438	2,827,510	1,338,675	3,882,469	8,048,654	2,048,161	24,143,261	26,191,423
<b>TOTAL</b>	<b>139,067,488</b>	<b>135,236,713</b>	<b>274,304,200</b>	<b>113,480,135</b>	<b>58,720,865</b>	<b>185,675,300</b>	<b>357,876,300</b>	<b>87,361,033</b>	<b>966,246,631</b>	<b>1,053,607,664</b>

(a) Unadjusted for prior overpayments or underpayments of charges.  
 (b) Determined at the current Project Interest Rate of 4.610 percent per annum.  
 (c) Reflects the transfers of permanent acquired capacity among contractors.

**TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor <sup>a b c</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Municipal and (d) Industrial	Agricultural				
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	0	2,725
1965	0	0	6,029	64,284	9,284	0	0	0	0	79,598
1966	0	0	12,039	120,256	17,073	0	0	0	0	149,368
1967	0	0	26,257	233,262	34,350	0	0	0	0	293,869
1968	78,117	1,784	48,950	335,771	48,966	426,564	9,407	4,788	65,858	1,020,205
1969	78,254	5,352	57,418	392,005	52,536	876,026	10,158	5,205	249,184	1,726,137
1970	85,765	5,352	59,224	423,404	53,922	1,065,509	10,446	5,413	184,401	1,893,436
1971	97,783	5,352	60,329	444,522	54,712	1,415,181	10,612	5,829	196,229	2,290,549
1972	109,255	5,352	60,945	454,227	55,075	2,119,110	10,694	11,171	605,353	3,431,181
1973	120,180	5,352	61,370	458,449	55,248	2,444,072	10,736	6,454	234,141	3,396,002
1974	182,401	5,352	61,890	460,485	55,349	2,736,999	10,770	7,226	388,635	3,909,106
1975	221,541	5,352	62,452	462,798	55,490	3,278,170	10,812	7,445	463,734	4,567,794
1976	168,913	5,352	62,720	464,655	55,679	3,533,840	10,853	8,408	331,745	4,642,164
1977	166,067	5,352	63,362	467,359	55,965	3,872,073	10,914	7,703	317,192	4,965,987
1978	177,539	0	65,796	469,216	56,156	4,304,136	11,019	8,119	340,309	5,432,291
1979	210,556	5,352	66,111	471,978	56,491	4,726,131	11,086	8,327	383,001	5,939,033
1980	223,972	5,352	66,399	474,721	56,828	5,157,273	11,157	11,866	385,469	6,393,037
1981	223,972	5,352	67,986	491,115	58,770	5,644,251	11,565	8,952	408,586	6,920,549
1982	223,972	5,352	67,996	488,835	58,707	6,093,714	11,552	9,368	431,166	7,390,663
1983	234,351	5,352	68,332	493,076	59,377	6,605,412	11,685	7,848	51,331	7,536,765
1984	246,369	5,352	68,950	498,702	60,083	6,933,267	11,834	9,993	336,605	8,171,155
1985	257,841	5,352	69,678	506,586	61,243	7,382,716	12,069	10,201	244,877	8,550,564
1986	269,313	5,352	69,966	508,983	61,587	7,502,675	12,141	10,617	522,560	8,963,194
1987	280,784	5,352	70,471	512,652	62,116	8,282,540	12,251	10,825	545,140	9,782,131
1988	292,256	5,352	70,832	515,513	62,526	8,706,366	12,334	11,242	567,720	10,244,140
1989	303,728	5,352	71,717	519,169	63,150	9,012,099	12,501	11,658	590,837	10,590,211
1990	157,600	5,352	73,153	537,527	65,389	9,329,743	12,936	11,866	637,072	10,830,639
1991	291,770	5,352	75,796	566,573	69,966	9,329,743	13,762	11,866	637,072	11,001,901
1992	315,200	5,352	78,990	597,260	74,817	9,329,743	14,756	11,866	637,072	11,065,056
1993	315,200	5,352	80,482	610,123	76,657	9,329,743	15,124	11,866	637,072	11,081,619
1994	315,200	5,352	82,105	619,494	77,936	9,329,743	15,397	11,866	637,072	11,094,165
1995	315,200	5,352	83,398	626,231	78,890	9,329,743	15,608	11,866	637,072	11,103,360
1996	291,547	5,352	87,367	635,384	80,221	9,009,728	15,961	11,866	637,072	10,774,499
1997	291,547	5,352	90,231	639,177	80,707	8,943,881	16,133	11,866	637,072	10,715,965
1998	291,546	5,352	92,940	652,602	82,732	8,691,228	16,588	11,866	637,072	10,481,927
1999	291,546	5,352	94,237	659,509	83,778	8,691,228	16,823	11,866	637,072	10,491,412
2000	291,546	5,352	95,750	667,629	85,008	8,048,088	17,096	11,866	637,072	9,859,408
2001	291,546	5,352	96,315	670,255	85,354	7,917,055	17,172	11,866	637,072	9,731,986
2002	313,667	5,352	96,772	672,352	85,648	7,917,055	17,237	11,866	598,315	9,718,263
2003	313,667	5,352	97,715	680,183	86,829	7,917,055	17,476	11,866	596,104	9,726,247
2004	313,667	5,352	97,385	675,632	86,046	7,905,017	44,951	11,866	513,753	9,653,670
2005	313,667	5,352	97,536	676,664	86,172	7,905,017	44,979	11,866	513,753	9,655,006
2006	313,667	5,352	97,889	679,904	86,637	7,905,017	46,759	11,866	512,068	9,659,160
2007	313,667	5,352	97,937	680,996	86,685	7,905,017	46,769	11,866	512,068	9,660,358
2008	313,667	5,352	98,145	682,701	86,851	7,905,017	46,803	11,866	512,068	9,662,470
2009	313,667	5,352	98,639	686,827	87,488	7,905,017	46,935	11,866	512,068	9,667,860
2010	275,428	5,352	98,832	689,801	87,722	7,734,123	46,982	11,866	473,380	9,423,485
2011	275,428	5,352	101,249	694,224	88,179	7,734,123	47,150	11,866	473,380	9,430,950
2012	275,428	5,352	104,471	697,889	88,654	7,734,123	47,350	11,866	473,380	9,438,513
2013	275,428	5,352	105,359	700,959	89,058	7,734,123	47,445	11,866	473,380	9,442,971
2014	<b>288,194</b>	<b>5,352</b>	<b>117,024</b>	<b>731,331</b>	<b>93,547</b>	<b>8,109,971</b>	<b>48,745</b>	<b>11,866</b>	<b>465,361</b>	<b>9,871,391</b>
2015	271,807	5,352	118,499	695,261	88,690	8,109,971	49,707	11,866	465,361	9,816,514
2016	271,807	5,352	113,980	645,250	81,737	8,109,971	49,902	11,866	465,361	9,755,227
2017	271,807	5,352	99,894	532,534	64,508	8,109,971	49,916	11,866	465,361	9,611,208
2018	271,807	5,352	77,201	430,025	49,891	8,109,971	40,509	11,866	465,361	9,461,983
2019	271,807	5,352	68,733	373,791	46,322	8,109,971	39,758	11,866	465,361	9,392,961
2020	249,955	5,352	66,926	342,392	44,936	8,109,971	39,470	11,866	465,361	9,336,229
2021	249,955	5,352	65,822	321,273	44,145	8,109,971	39,304	11,866	465,361	9,313,049
2022	249,955	5,352	65,206	311,568	43,783	8,109,971	39,222	11,866	465,361	9,302,284
2023	249,955	5,352	64,780	307,347	43,609	8,109,971	39,179	11,866	465,361	9,297,421
2024	249,955	5,352	64,261	305,311	43,508	8,109,971	39,146	11,866	465,361	9,294,731
2025	249,955	5,352	63,698	302,998	43,367	8,109,971	39,104	11,866	465,361	9,291,673
2026	249,955	5,352	63,431	301,141	43,179	8,109,971	39,063	11,866	465,361	9,289,318
2027	249,955	5,352	62,789	298,437	42,892	8,109,971	39,001	11,866	465,361	9,285,625
2028	249,955	5,352	60,355	296,579	42,701	8,109,971	38,896	11,866	465,361	9,281,036
2029	249,955	5,352	60,040	293,818	42,366	8,109,971	38,830	11,866	465,361	9,277,559
2030	249,955	5,352	59,752	291,074	42,029	8,109,971	38,759	11,866	465,361	9,274,119
2031	249,955	5,352	58,165	274,681	40,088	8,109,971	38,350	11,866	465,361	9,253,788
2032	249,955	5,352	58,154	276,961	40,150	8,109,971	38,364	11,866	465,361	9,256,134
2033	249,955	5,352	57,818	272,719	39,481	8,109,971	38,231	11,866	465,361	9,250,754
2034	249,955	5,352	57,201	267,093	38,774	8,109,971	38,082	11,866	465,361	9,243,655
2035	249,955	5,352	56,472	259,209	37,615	8,109,971	37,847	11,866	465,361	9,233,648
<b>TOTAL</b>	<b>16,969,934</b>	<b>355,016</b>	<b>5,272,839</b>	<b>34,562,715</b>	<b>4,405,425</b>	<b>482,017,856</b>	<b>1,834,173</b>	<b>734,494</b>	<b>31,890,596</b>	<b>578,043,407</b>

- (a) Unadjusted for prior overpayments or underpayments of charges.
- (b) Determined at the current Project Interest Rate of 4.610 percent per annum.
- (c) Reflects the transfers of permanent acquired capacity among contractors.
- (d) Charges under Amendment No. 18 of the water supply contract with Kern County Water Agency.

**TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor<sup>a b c</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	34,411	0	0	0	726	0	0	0	51,729	0
1964	64,494	27,447	19,542	4,370	38,211	1,143	29,757	8,205	82,811	34,987
1965	121,484	53,007	34,348	7,194	42,701	2,082	52,705	15,222	135,069	35,344
1966	221,012	101,264	62,476	12,478	76,886	3,753	94,978	27,679	232,502	61,465
1967	427,622	210,814	121,269	23,472	148,839	7,284	184,247	54,023	433,350	115,574
1968	689,327	419,850	206,952	38,551	245,877	11,781	304,096	87,293	729,849	194,527
1969	1,003,797	623,724	318,583	57,301	368,426	17,249	455,380	127,219	1,136,415	302,649
1970	1,312,832	780,647	451,031	84,796	520,243	23,427	633,534	171,297	1,691,461	443,708
1971	1,581,850	947,745	595,102	120,210	700,914	28,845	841,602	208,821	2,394,083	619,778
1972	1,720,363	1,057,413	671,098	137,454	795,465	31,306	954,671	226,497	2,808,504	720,983
1973	1,772,377	1,071,990	696,065	142,143	825,044	32,281	991,374	233,340	2,945,564	756,530
1974	1,791,355	1,118,690	707,278	146,331	839,031	32,602	1,004,820	235,688	3,035,230	777,084
1975	1,815,881	1,133,243	724,295	150,105	861,611	33,017	1,033,165	238,700	3,117,604	798,777
1976	1,829,760	1,145,915	736,112	152,796	878,290	33,269	1,054,085	240,431	3,195,714	819,552
1977	1,842,615	1,159,069	744,718	154,692	890,124	33,485	1,069,256	242,010	3,244,723	832,585
1978	1,853,320	1,178,187	750,483	156,009	898,031	33,676	1,079,644	243,377	3,274,945	840,507
1979	1,869,355	1,202,327	756,140	157,141	904,987	33,942	1,088,853	245,346	3,296,693	846,199
1980	1,888,324	1,250,349	762,012	158,251	912,220	34,247	1,098,555	247,607	3,317,247	851,720
1981	1,987,339	1,341,090	796,384	164,015	950,529	35,899	1,146,728	259,877	3,421,183	879,634
1982	1,978,809	1,372,404	789,720	163,563	945,667	35,768	1,141,184	258,879	3,413,856	877,416
1983	2,061,590	1,416,538	809,319	167,582	971,692	37,104	1,174,466	268,895	3,486,248	897,190
1984	2,171,231	1,443,239	834,564	173,473	1,006,034	38,871	1,213,483	282,134	3,594,542	926,815
1985	2,251,676	1,458,511	851,720	177,807	1,031,452	40,260	1,245,662	291,738	3,673,311	948,379
1986	2,299,323	1,466,803	863,875	180,992	1,049,921	40,927	1,277,982	297,214	3,730,198	963,927
1987	2,344,046	1,472,383	876,261	183,970	1,068,826	41,390	1,293,557	301,992	3,783,895	978,588
1988	2,362,143	1,478,017	885,509	186,235	1,083,080	41,677	1,312,014	304,089	3,824,257	989,568
1989	2,376,030	1,487,181	889,631	187,412	1,088,857	41,852	1,319,389	305,475	3,846,509	995,456
1990	2,432,706	1,509,975	912,986	192,472	1,118,024	42,727	1,355,491	312,010	3,918,238	1,014,854
1991	2,469,661	1,529,622	932,659	197,604	1,147,282	43,112	1,391,353	315,536	3,997,480	1,036,359
1992	2,514,880	1,550,868	953,475	203,996	1,179,589	43,744	1,430,483	320,432	4,102,102	1,064,912
1993	2,549,874	1,569,875	969,784	210,989	1,203,773	44,253	1,457,682	324,519	4,213,571	1,095,444
1994	2,585,113	1,587,697	983,985	220,171	1,223,934	44,800	1,477,236	328,488	4,420,076	1,151,617
1995	2,611,217	1,596,657	992,587	225,248	1,236,069	45,193	1,489,426	331,367	4,547,097	1,186,123
1996	2,637,094	1,612,665	1,001,843	229,526	1,248,440	45,599	1,502,629	334,344	4,654,074	1,215,084
1997	2,654,359	1,624,052	1,010,118	232,003	1,258,944	45,868	1,514,863	336,316	4,875,746	1,268,666
1998	2,679,335	1,637,939	1,017,568	233,373	1,268,786	46,279	2,040,155	339,344	5,036,613	1,290,750
1999	2,692,811	1,649,324	1,022,130	235,684	1,274,800	46,503	2,047,313	341,005	5,243,553	1,307,788
2000	2,708,447	2,803,281	1,028,194	237,960	1,283,376	46,776	2,057,958	404,963	5,569,174	1,321,137
2001	2,716,761	2,809,222	1,032,076	239,333	1,288,723	46,930	2,064,718	406,167	6,393,264	1,330,966
2002	2,741,247	2,812,515	1,035,440	240,242	1,293,862	47,103	2,071,123	407,441	7,573,077	1,336,562
2003	2,751,254	2,820,157	1,038,199	240,913	1,297,179	47,248	2,075,963	408,633	8,152,654	1,344,008
2004	2,748,677	2,820,073	1,093,477	241,040	1,297,550	47,200	2,076,649	408,332	8,388,121	1,345,632
2005	2,752,658	2,823,492	6,706,958	241,377	2,057,675	47,268	2,079,715	408,906	8,518,216	1,347,956
2006	2,764,421	2,832,927	6,773,462	242,113	2,070,370	47,466	2,086,146	410,587	8,579,145	1,351,712
2007	2,785,372	2,858,156	6,902,566	243,648	2,094,338	47,804	2,098,129	413,677	8,705,829	1,358,630
2008	2,801,849	2,876,522	7,026,794	245,021	2,116,705	48,083	2,108,405	416,109	8,841,045	1,365,390
2009	2,809,531	2,891,076	7,116,173	248,837	2,135,006	48,217	2,113,012	417,162	9,057,071	1,381,858
2010	2,849,260	2,927,386	7,497,047	252,814	2,233,462	48,863	2,177,350	422,998	9,372,604	1,399,751
2011	2,894,731	2,963,599	7,671,214	257,044	2,277,333	49,590	2,211,249	429,600	9,740,973	1,418,994
2012	2,917,947	2,983,814	7,817,026	261,044	2,320,828	49,952	2,247,310	432,845	10,185,877	1,438,372
2013	2,895,498	2,992,589	7,993,232	266,778	2,364,615	50,161	2,294,849	434,421	10,989,421	1,454,215
2014	<b>2,939,910</b>	<b>3,004,173</b>	<b>8,383,887</b>	<b>267,328</b>	<b>2,431,636</b>	<b>49,991</b>	<b>2,293,295</b>	<b>433,134</b>	<b>11,090,387</b>	<b>1,477,195</b>
2015	2,922,139	2,994,717	8,272,278	267,024	2,549,283	49,773	2,338,143	430,820	11,138,681	1,490,039
2016	2,841,639	2,953,953	10,543,205	262,988	2,697,466	48,449	2,299,260	419,992	11,092,844	1,477,875
2017	2,635,340	2,826,976	11,118,042	252,008	2,711,187	44,924	2,193,446	391,591	10,892,246	1,423,835
2018	2,373,635	2,539,162	10,963,401	236,929	2,604,834	40,427	2,044,505	354,369	10,595,747	1,344,881
2019	2,059,165	2,243,121	10,507,437	218,179	2,435,775	34,959	1,851,375	308,262	10,189,181	1,236,759
2020	1,750,130	2,012,411	9,957,812	190,684	2,227,608	28,781	1,674,003	257,330	9,634,135	1,095,701
2021	1,481,112	1,765,332	9,285,589	155,270	1,975,598	23,363	1,421,054	213,940	8,931,513	919,630
2022	1,342,599	1,605,797	8,377,650	138,026	1,768,672	20,902	1,284,617	193,090	8,517,092	818,426
2023	1,290,586	1,598,072	7,673,890	133,337	1,647,404	19,927	1,239,220	185,053	8,380,032	782,879
2024	1,271,608	1,539,199	7,557,323	129,149	1,619,186	19,606	1,222,685	182,242	8,290,366	762,324
2025	1,247,081	1,521,334	7,442,069	125,375	1,583,337	19,191	1,190,914	178,667	8,207,992	740,632
2026	1,233,203	1,503,086	7,338,200	122,684	1,554,224	18,939	1,168,198	176,647	8,129,882	719,857
2027	1,220,348	1,484,575	7,261,848	120,788	1,533,239	18,723	1,151,759	174,835	8,080,873	706,824
2028	1,209,642	1,456,739	7,224,631	119,471	1,521,081	18,531	1,140,898	173,318	8,050,751	698,902
2029	1,193,608	1,418,426	7,192,301	118,339	1,510,525	18,265	1,130,513	171,106	8,028,903	693,210
2030	1,174,639	1,341,212	7,165,714	117,229	1,500,494	17,961	1,119,613	168,592	8,008,349	687,688
2031	1,075,624	1,198,159	7,027,103	111,465	1,448,105	16,309	1,057,617	154,429	7,904,413	659,774
2032	1,084,153	1,146,654	7,039,906	111,917	1,453,796	16,440	1,068,845	156,062	7,911,740	661,993
2033	1,001,372	1,074,103	6,958,375	107,898	1,419,405	15,104	1,031,434	145,397	7,839,348	642,219
2034	891,731	1,031,866	6,845,819	102,007	1,373,270	13,337	983,356	131,407	7,731,055	612,594
2035	811,287	1,010,145	6,761,893	97,673	1,338,833	11,948	949,673	121,510	7,652,285	591,030
<b>TOTAL</b>	<b>141,687,619</b>	<b>121,770,542</b>	<b>278,381,831</b>	<b>12,433,343</b>	<b>98,339,121</b>	<b>2,433,728</b>	<b>100,418,460</b>	<b>19,650,049</b>	<b>429,270,226</b>	<b>68,579,986</b>

- (a) Unadjusted for prior overpayments or underpayments of charges.
- (b) Determined at the current Project Interest Rate of 4.610 percent per annum.
- (c) Reflects the transfers of permanent acquired capacity among contractors.



**TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor<sup>a b c</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	690,812	0	777,678	0	0	0	0	0	1,401,957
1964	21,735	1,260,513	9,378	1,602,594	0	0	0	0	0	2,550,849
1965	21,866	2,180,589	17,766	2,719,376	0	0	405	405	0	4,292,847
1966	37,964	3,900,172	33,426	4,866,058	0	0	565	565	0	6,806,390
1967	71,283	7,693,703	68,155	9,559,635	0	0	562	562	0	11,970,241
1968	120,094	14,345,147	133,299	17,526,644	0	0	564	564	0	21,160,862
1969	187,059	21,857,456	202,599	26,657,857	0	0	3,191	3,191	0	31,336,093
1970	275,010	28,992,595	257,859	35,638,440	0	0	15,121	15,121	0	40,600,240
1971	385,025	37,242,413	316,307	45,982,696	0	0	15,947	15,947	0	51,369,529
1972	448,055	44,062,125	353,935	53,987,869	0	0	17,332	17,332	0	60,530,258
1973	470,185	46,299,581	357,342	56,593,813	0	0	17,333	17,333	0	63,142,192
1974	483,259	48,322,678	372,112	58,866,159	0	0	17,334	17,334	0	65,939,769
1975	496,722	49,285,084	376,511	60,064,715	0	0	17,337	17,337	0	67,820,543
1976	509,650	50,137,295	380,788	61,113,656	0	0	17,338	17,338	0	68,961,221
1977	517,741	50,827,166	385,097	61,943,282	0	0	17,340	17,340	0	70,140,281
1978	522,656	51,426,581	390,742	62,648,038	0	0	17,342	17,342	0	71,350,407
1979	526,178	52,230,344	399,649	63,557,155	0	0	17,344	17,344	0	72,797,951
1980	529,583	53,637,412	417,136	65,104,663	0	0	17,345	17,345	0	74,842,843
1981	546,787	56,667,437	449,812	68,646,713	0	0	17,346	17,346	0	79,006,416
1982	545,445	57,465,063	461,234	69,449,007	0	0	17,348	17,348	0	80,295,319
1983	557,607	59,037,472	477,333	71,363,037	0	0	17,348	17,348	0	82,428,068
1984	575,830	60,313,580	486,863	73,060,658	0	0	17,349	17,349	0	84,939,340
1985	589,089	61,144,629	492,117	74,196,350	0	0	17,351	17,351	0	86,769,123
1986	598,648	61,666,346	494,977	74,931,134	0	0	17,352	17,352	0	88,619,064
1987	607,664	62,094,710	496,758	75,544,040	0	0	17,354	17,354	0	91,485,432
1988	614,418	62,452,912	498,619	76,032,540	0	0	17,355	17,355	0	93,585,368
1989	618,059	62,796,236	501,579	76,453,666	0	0	17,358	17,358	0	94,812,609
1990	629,934	63,762,459	509,566	77,711,443	0	0	17,360	17,360	0	96,553,727
1991	643,118	64,677,355	516,147	78,897,288	0	0	17,364	17,364	0	98,132,548
1992	660,626	65,776,353	523,154	80,324,614	0	0	17,367	17,367	0	99,865,120
1993	679,343	66,905,041	529,383	81,753,532	0	0	17,369	17,369	0	101,569,750
1994	714,062	68,486,622	535,055	83,758,856	0	0	17,370	17,370	0	104,343,311
1995	735,431	69,373,540	537,812	84,907,766	0	0	17,371	17,371	0	108,270,991
1996	753,512	70,251,056	541,753	86,027,619	0	0	17,371	17,371	0	118,235,551
1997	812,976	71,530,953	544,467	87,709,332	0	0	17,371	17,371	0	128,505,084
1998	919,464	72,283,436	548,490	89,341,533	0	0	0	0	0	132,214,967
1999	1,100,324	72,917,423	552,184	90,430,841	0	0	0	0	0	133,966,172
2000	1,434,718	73,432,162	555,279	92,883,425	0	0	0	0	0	136,569,345
2001	2,371,146	73,741,965	556,658	94,997,929	0	0	0	0	0	139,550,034
2002	3,744,046	73,915,736	557,417	97,775,631	0	0	0	0	0	142,488,911
2003	4,400,394	74,227,711	559,468	99,363,780	0	0	17,375	17,375	0	144,633,291
2004	4,668,372	74,463,765	559,218	100,158,108	0	0	17,375	17,375	0	145,853,297
2005	4,807,001	68,352,994	560,019	100,704,235	0	0	17,375	17,375	0	146,722,405
2006	4,856,806	68,688,724	562,234	101,266,115	0	0	17,375	17,375	0	147,436,607
2007	4,969,531	69,406,862	567,748	102,452,291	0	0	17,376	17,376	0	148,904,363
2008	5,103,979	70,008,526	571,813	103,529,881	0	0	17,376	17,376	0	150,442,460
2009	5,285,419	70,640,102	575,320	104,718,785	0	0	17,376	17,376	0	152,631,907
2010	5,566,282	71,862,981	583,368	107,194,165	0	0	17,377	17,377	0	155,827,644
2011	5,923,373	72,904,779	590,594	109,333,072	0	0	17,377	17,377	0	159,506,468
2012	6,372,047	73,608,916	594,147	111,230,125	0	0	17,377	17,377	0	162,790,802
2013	7,255,552	73,841,073	596,048	113,428,452	0	0	17,377	17,377	0	165,230,475
2014	<b>7,272,598</b>	<b>75,097,880</b>	<b>594,751</b>	<b>115,336,165</b>	<b>0</b>	<b>0</b>	<b>17,377</b>	<b>17,377</b>	<b>0</b>	<b>167,823,333</b>
2015	7,282,081	76,741,984	591,828	118,068,789	0	0	16,972	16,972	0	170,111,639
2016	7,274,682	78,208,929	579,738	120,701,021	0	0	16,812	16,812	0	172,484,583
2017	7,241,406	76,314,714	546,542	118,592,258	0	0	16,815	16,815	0	169,906,486
2018	7,192,595	70,305,957	481,399	111,077,642	0	0	16,813	16,813	0	161,731,604
2019	7,125,630	63,184,492	412,099	101,806,434	0	0	14,186	14,186	0	152,043,798
2020	7,037,679	56,522,880	356,838	92,745,993	0	0	2,256	2,256	0	142,808,379
2021	6,927,664	48,872,553	298,390	82,271,008	0	0	1,430	1,430	0	132,281,634
2022	6,864,634	42,997,159	260,762	74,189,426	0	0	45	45	0	124,174,185
2023	6,842,504	41,530,185	257,356	71,580,446	0	0	44	44	0	121,516,826
2024	6,829,430	39,626,673	242,585	69,292,376	0	0	43	43	0	119,213,431
2025	6,815,967	38,775,773	238,187	68,086,518	0	0	40	40	0	117,979,617
2026	6,803,039	38,028,048	233,910	67,029,917	0	0	39	39	0	116,902,297
2027	6,794,948	37,415,073	229,600	66,193,432	0	0	37	37	0	116,035,618
2028	6,790,033	36,851,383	223,955	65,479,336	0	0	35	35	0	115,276,834
2029	6,786,511	36,077,872	215,049	64,554,625	0	0	33	33	0	114,315,593
2030	6,783,106	34,694,317	197,561	62,976,475	0	0	32	32	0	112,687,795
2031	6,765,902	31,782,611	164,885	59,366,396	0	0	31	31	0	108,958,737
2032	6,767,244	30,978,018	153,464	58,550,231	0	0	29	29	0	108,125,728
2033	6,755,082	29,475,905	137,365	56,603,007	0	0	29	29	0	106,093,358
2034	6,736,859	28,298,903	127,835	54,880,038	0	0	28	28	0	104,169,921
2035	6,723,600	27,543,642	122,581	53,736,098	0	0	26	26	0	102,675,287
TOTAL	237,698,263	3,842,415,538	28,825,416	5,381,904,121	0	0	781,794	781,794	0	7,646,517,127

- (a) Unadjusted for prior overpayments or underpayments of charges.
- (b) Determined at the current Project Interest Rate of 4.610 percent per annum.
- (c) Reflects the transfers of permanent aqueduct capacity among contractors.

**TABLE B-16A Minimum OMP&R Component of Transportation Charge for Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	9,699	8,868	21,132	39,699	0	0	0
1963	0	0	0	38,048	34,788	82,896	155,732	0	0	0
1964	0	0	0	41,148	38,323	91,320	170,791	0	0	0
1965	0	0	0	78,529	75,616	195,793	349,937	0	0	0
1966	0	0	0	79,753	78,779	218,543	377,076	0	0	0
1967	0	0	0	127,896	123,667	335,224	586,787	0	0	0
1968	130	0	130	126,058	120,563	333,506	580,128	11,800	21,770	33,571
1969	80,875	0	80,875	145,411	138,050	372,585	656,046	63,113	116,435	179,548
1970	94,872	0	94,872	128,993	120,245	320,664	569,902	74,187	136,867	211,054
1971	45,579	0	45,579	113,071	108,346	296,004	517,421	74,011	136,541	210,552
1972	37,895	0	37,895	122,407	117,483	334,366	574,256	79,196	146,107	225,303
1973	32,993	0	32,993	122,738	116,785	325,726	565,250	75,714	139,683	215,398
1974	46,498	0	46,498	154,435	146,929	403,080	704,444	76,530	141,189	217,719
1975	37,707	0	37,707	189,175	182,087	513,823	885,086	92,605	170,845	263,450
1976	60,786	0	60,786	203,064	193,435	524,813	921,312	94,935	175,144	270,079
1977	78,400	0	78,400	179,869	169,065	500,101	849,035	102,945	189,922	292,867
1978	56,318	0	56,318	239,301	228,855	647,828	1,115,984	104,060	191,978	296,038
1979	73,852	0	73,852	236,986	232,105	666,742	1,135,833	100,748	185,868	286,617
1980	81,769	0	81,769	389,575	372,185	1,010,830	1,772,591	126,328	233,105	359,433
1981	101,340	0	101,340	317,408	302,272	834,257	1,453,937	140,208	258,712	398,920
1982	191,987	0	191,987	386,742	369,633	1,098,844	1,855,219	142,045	262,101	404,146
1983	80,215	0	80,215	438,536	428,973	1,269,373	2,136,882	171,001	315,523	486,524
1984	106,485	0	106,485	591,243	565,721	1,817,629	2,974,593	201,768	372,284	574,052
1985	215,341	0	215,341	674,975	655,490	1,840,211	3,170,677	242,935	448,233	691,167
1986	203,704	0	203,704	613,273	583,077	1,784,056	2,980,407	233,000	429,904	662,905
1987	295,505	0	295,505	687,629	652,468	2,000,817	3,340,914	230,484	463,838	694,322
1988	312,677	(58)	312,619	676,847	655,274	1,910,092	3,242,213	258,807	561,030	819,837
1989	403,330	688,185	1,091,515	716,831	712,354	1,897,149	3,326,335	244,772	668,476	913,248
1990	658,942	674,944	1,333,886	782,589	780,305	2,129,966	3,692,860	310,222	677,025	987,247
1991	726,717	860,903	1,587,620	543,178	524,741	1,520,569	2,588,488	302,369	673,858	976,227
1992	483,580	712,313	1,195,893	796,058	855,050	2,253,496	3,904,605	346,220	736,477	1,082,698
1993	524,000	708,129	1,232,129	1,280,736	1,261,431	3,338,742	5,880,908	386,060	734,138	1,120,197
1994	573,814	658,274	1,232,087	1,368,665	1,312,746	3,560,310	6,241,720	481,022	888,287	1,369,309
1995	539,407	660,770	1,200,177	1,232,272	1,187,201	3,216,470	5,635,943	477,929	881,323	1,359,251
1996	604,992	1,011,298	1,616,291	1,185,220	1,124,968	3,007,330	5,317,518	649,161	1,197,179	1,846,340
1997	563,579	741,881	1,305,460	1,029,670	968,999	2,667,649	4,666,319	406,652	749,805	1,156,456
1998	461,844	661,193	1,123,037	1,064,729	1,174,897	3,502,733	5,742,360	810,087	3,051,492	3,861,579
1999	614,991	1,009,121	1,624,112	1,248,430	1,289,931	5,148,028	7,686,389	797,663	3,104,794	3,902,457
2000	779,072	1,498,074	2,277,146	2,194,329	1,305,244	3,780,655	7,280,228	718,330	3,165,067	3,883,397
2001	652,503	1,445,444	2,097,948	4,194,807	1,038,347	3,545,192	8,778,346	734,048	2,958,573	3,692,621
2002	1,097,576	1,872,253	2,969,829	8,258,786	1,357,138	6,058,171	15,674,094	770,581	3,349,800	4,120,381
2003	1,176,494	2,260,317	3,436,811	4,932,697	1,071,991	3,587,583	9,592,271	827,744	3,546,882	4,374,626
2004	1,627,310	2,360,776	3,988,087	2,612,652	1,294,583	3,576,109	7,483,344	829,864	3,485,869	4,315,734
2005	920,025	1,801,485	2,721,510	2,405,461	1,136,447	2,965,766	6,507,674	879,363	3,798,743	4,678,106
2006	846,973	1,421,635	2,268,608	2,488,668	1,206,030	3,286,763	6,981,460	778,059	3,757,647	4,535,706
2007	837,140	1,603,370	2,440,510	3,185,815	1,548,771	3,975,992	8,710,578	862,337	3,700,289	4,632,626
2008	1,121,152	1,505,037	2,626,189	3,597,015	1,749,566	4,467,886	9,814,467	1,284,185	5,508,339	6,792,524
2009	1,166,532	1,837,899	3,004,431	3,183,747	1,436,080	4,098,322	8,718,150	1,110,501	4,646,454	5,756,956
2010	1,251,834	3,256,021	4,507,854	3,055,515	1,491,401	4,153,835	8,700,751	1,459,868	6,459,208	7,919,076
2011	1,626,450	3,673,066	5,299,517	3,390,793	1,632,146	4,402,116	9,425,054	1,481,027	6,750,667	8,231,694
2012	2,066,711	3,449,010	5,515,720	3,613,767	1,722,928	6,624,497	11,961,192	1,482,409	7,507,947	8,990,356
2013	1,586,746	3,513,079	5,099,825	3,506,238	1,724,348	4,949,288	10,179,874	1,559,153	7,393,312	8,952,465
2014	1,642,555	3,806,499	5,449,054	3,649,872	1,740,032	4,968,086	10,357,989	1,803,626	7,788,764	9,592,390
2015	1,630,002	3,714,522	5,344,525	3,541,972	1,726,403	4,929,596	10,197,971	1,508,057	7,052,319	8,560,375
2016	1,634,951	3,713,146	5,348,097	3,598,859	1,746,099	4,994,993	10,339,951	1,638,975	7,483,991	9,122,966
2017	1,623,798	3,705,026	5,328,823	3,558,454	1,723,761	4,950,184	10,232,400	1,631,675	7,515,729	9,147,404
2018	1,640,036	3,742,076	5,382,112	3,594,039	1,740,999	4,999,665	10,334,723	1,647,992	7,590,887	9,238,878
2019	1,656,435	3,779,497	5,435,932	3,629,979	1,758,409	5,049,682	10,438,071	1,664,472	7,666,796	9,331,268
2020	1,672,998	3,817,287	5,490,285	3,666,259	1,775,992	5,100,179	10,542,430	1,681,116	7,743,463	9,424,580
2021	1,689,728	3,855,460	5,545,188	3,702,922	1,793,752	5,151,181	10,647,856	1,697,928	7,820,898	9,518,826
2022	1,706,625	3,894,015	5,600,640	3,739,951	1,811,690	5,202,693	10,754,335	1,714,907	7,899,107	9,614,014
2023	1,723,691	3,932,955	5,656,646	3,777,351	1,829,807	5,254,719	10,861,876	1,732,056	7,978,098	9,710,154
2024	1,740,929	3,972,284	5,713,213	3,815,124	1,848,105	5,307,266	10,970,495	1,749,377	8,057,880	9,807,256
2025	1,758,337	4,012,007	5,770,344	3,853,276	1,866,586	5,360,340	11,080,201	1,766,870	8,138,458	9,905,328
2026	1,775,921	4,052,127	5,828,048	3,891,808	1,885,252	5,413,943	11,191,003	1,784,539	8,219,843	10,004,382
2027	1,793,680	4,092,649	5,886,329	3,930,726	1,904,104	5,468,083	11,302,913	1,802,384	8,302,041	10,104,426
2028	1,811,617	4,133,575	5,945,192	3,970,033	1,923,145	5,522,763	11,415,941	1,820,408	8,385,061	10,205,469
2029	1,829,733	4,174,911	6,004,645	4,009,734	1,942,377	5,577,991	11,530,102	1,838,612	8,468,912	10,307,524
2030	1,848,030	4,216,660	6,064,691	4,049,831	1,961,801	5,633,771	11,645,402	1,856,998	8,553,602	10,410,600
2031	1,866,511	4,258,827	6,125,337	4,090,330	1,981,418	5,690,108	11,761,856	1,875,568	8,639,137	10,514,705
2032	1,885,176	4,301,415	6,186,590	4,131,232	2,001,233	5,747,009	11,879,474	1,894,324	8,725,529	10,619,853
2033	1,904,028	4,344,429	6,248,457	4,172,546	2,021,245	5,804,480	11,998,271	1,913,267	8,812,784	10,726,052
2034	1,923,067	4,387,873	6,310,941	4,214,270	2,041,458	5,862,525	12,118,253	1,932,400	8,900,911	10,833,311
2035	1,942,298	4,431,752	6,374,051	4,256,413	2,061,872	5,921,149	12,239,433	1,951,724	8,989,921	10,941,645
<b>TOTAL</b>	<b>63,846,788</b>	<b>128,223,413</b>	<b>192,070,201</b>	<b>153,826,460</b>	<b>78,812,266</b>	<b>229,375,298</b>	<b>462,014,024</b>	<b>61,593,323</b>	<b>263,292,861</b>	<b>324,886,185</b>

**TABLE B-16A Minimum OMP&R Component of  
Transportation Charge for Each Contractor**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total	
				Municipal and Industrial	Agricultural					
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	
1961	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	
1968	37,806	1,963	5,639	60,701	678,086	2,008	2,073	77,591	865,867	
1969	45,479	2,235	30,158	80,554	1,197,126	2,286	2,085	90,773	1,450,698	
1970	46,969	2,292	35,450	96,673	1,381,493	2,344	2,158	93,408	1,660,786	
1971	47,997	2,314	35,366	106,654	1,643,163	2,366	2,288	94,874	1,935,021	
1972	49,866	2,414	37,844	122,313	1,729,169	2,469	2,254	98,777	2,045,106	
1973	50,006	2,385	36,180	125,553	1,719,873	2,440	2,310	98,330	2,037,076	
1974	52,818	2,556	36,570	135,661	1,823,065	2,614	2,529	104,609	2,160,424	
1975	66,963	3,243	44,251	162,738	2,235,242	3,317	3,191	132,663	2,651,608	
1976	66,504	3,328	45,364	159,303	2,215,999	3,404	2,919	133,940	2,630,761	
1977	75,595	3,812	49,192	189,661	2,522,290	3,898	3,708	152,838	3,000,994	
1978	70,688	3,503	49,725	174,897	2,427,163	3,583	3,644	141,672	2,874,875	
1979	68,879	3,436	48,142	173,677	2,378,315	3,514	3,492	138,493	2,817,948	
1980	95,898	4,722	59,551	235,741	3,146,570	4,830	4,777	191,582	3,743,671	
1981	118,448	5,965	66,183	266,353	3,440,557	6,099	5,187	239,323	4,148,116	
1982	134,083	6,711	67,061	311,879	3,848,922	6,862	6,382	270,061	4,651,960	
1983	184,902	9,242	80,869	426,485	5,030,031	9,450	8,494	372,182	6,121,656	
1984	194,228	9,656	95,555	471,854	5,636,134	9,874	8,719	389,892	6,815,912	
1985	200,694	9,957	115,227	486,162	6,042,593	10,182	8,982	402,457	7,276,254	
1986	207,028	10,302	110,479	530,803	6,372,710	10,536	10,341	415,776	7,667,975	
1987	205,002	10,259	109,401	533,451	6,378,437	10,493	10,517	412,889	7,670,450	
1988	203,711	10,223	122,903	516,432	6,388,497	10,455	10,341	410,868	7,673,430	
1989	224,049	11,269	116,197	564,169	6,747,046	11,526	11,102	452,406	8,137,763	
1990	271,051	13,666	148,238	664,040	8,111,616	13,976	13,206	547,974	9,783,767	
1991	275,748	13,854	144,486	662,755	8,111,610	14,168	13,218	556,474	9,792,313	
1992	317,889	16,027	162,466	764,224	9,115,453	16,393	18,209	642,672	11,053,333	
1993	359,879	17,989	184,477	831,662	10,372,245	18,399	19,560	724,397	12,528,608	
1994	309,084	15,486	224,254	738,619	9,789,833	15,839	16,434	622,879	11,732,427	
1995	395,441	19,918	220,899	898,339	11,190,121	20,373	21,551	799,070	13,565,713	
1996	362,623	19,968	301,835	902,162	11,872,821	20,424	21,664	796,711	14,298,209	
1997	366,476	20,154	186,450	942,987	10,558,144	20,613	19,344	806,084	12,920,252	
1998	453,033	24,560	288,906	1,098,213	12,207,920	25,122	21,594	995,194	15,114,543	
1999	385,900	21,263	276,543	984,711	11,152,355	21,747	21,989	848,107	13,712,615	
2000	386,622	21,266	208,668	1,026,758	10,007,502	21,749	22,815	848,835	12,544,217	
2001	463,235	25,486	231,855	1,210,299	11,259,599	26,065	31,721	1,017,296	14,265,555	
2002	426,030	21,580	224,116	1,080,257	10,230,940	22,052	25,590	813,275	12,843,810	
2003	500,840	25,508	248,922	1,191,455	11,412,691	26,091	30,978	956,231	14,388,717	
2004	449,128	22,993	247,728	1,140,021	10,806,480	62,652	25,747	743,270	13,498,020	
2005	427,262	21,924	258,381	1,014,428	10,332,904	59,650	24,378	708,042	12,846,969	
2006	468,601	23,955	198,123	1,119,638	10,432,447	72,333	26,660	772,284	13,114,041	
2007	530,390	26,890	234,916	1,275,887	11,743,058	82,911	27,474	869,566	14,791,092	
2008	637,605	32,863	370,378	1,547,620	15,267,120	103,120	33,476	1,056,312	19,048,495	
2009	517,859	26,319	333,670	1,271,239	12,761,707	84,247	27,038	850,348	15,872,427	
2010	511,655	29,734	407,770	1,338,535	13,359,600	96,153	28,797	888,157	16,660,401	
2011	590,551	34,548	399,233	1,623,375	15,322,994	109,506	39,619	1,029,801	19,149,627	
2012	556,794	32,388	359,963	1,607,337	15,180,970	101,673	30,662	967,190	18,836,977	
2013	633,377	36,914	426,942	1,694,493	16,492,050	115,656	32,686	1,101,712	20,533,830	
<b>2014</b>	<b>698,663</b>	<b>38,833</b>	<b>548,434</b>	<b>1,767,027</b>	<b>18,950,083</b>	<b>125,277</b>	<b>37,790</b>	<b>1,140,477</b>	<b>23,306,583</b>	
2015	617,096	36,204	420,144	1,674,989	17,112,837	113,882	32,152	1,064,752	21,072,056	
2016	640,035	37,690	469,824	1,724,708	17,942,276	119,453	34,551	1,107,185	22,075,722	
2017	646,436	38,067	474,522	1,628,623	18,121,699	120,648	34,896	1,118,256	22,183,148	
2018	652,900	38,448	479,267	1,644,910	18,302,916	121,854	35,245	1,129,439	22,404,979	
2019	659,429	38,832	484,060	1,661,359	18,485,945	123,073	35,598	1,140,733	22,629,028	
2020	612,428	39,220	488,901	1,677,441	18,666,594	124,304	35,954	1,152,141	22,796,983	
2021	618,553	39,613	493,790	1,694,215	18,853,259	125,547	36,313	1,163,662	23,024,953	
2022	624,738	40,009	498,728	1,711,157	19,041,792	126,803	36,676	1,175,299	23,255,203	
2023	630,986	40,409	503,716	1,728,289	19,232,210	128,071	37,043	1,187,052	23,487,755	
2024	637,285	40,813	508,753	1,745,551	19,424,532	129,352	37,414	1,198,922	23,722,632	
2025	643,668	41,221	513,840	1,763,007	19,618,777	130,645	37,788	1,210,911	23,959,858	
2026	650,105	41,633	518,979	1,780,637	19,814,965	131,951	38,166	1,223,021	24,199,456	
2027	656,606	42,050	524,168	1,798,443	20,013,115	133,271	38,547	1,235,251	24,441,452	
2028	663,172	42,470	529,410	1,816,428	20,213,246	134,604	38,933	1,247,603	24,685,866	
2029	669,804	42,895	534,704	1,834,592	20,415,379	135,950	39,322	1,260,079	24,932,726	
2030	676,502	43,324	540,051	1,852,938	20,619,532	137,309	39,715	1,272,680	25,182,052	
2031	683,267	43,757	545,452	1,871,467	20,825,728	138,682	40,112	1,285,407	25,433,872	
2032	690,100	44,195	550,906	1,890,182	21,033,985	140,069	40,514	1,298,261	25,688,211	
2033	697,001	44,636	556,415	1,909,084	21,244,325	141,470	40,919	1,311,244	25,945,094	
2034	703,971	45,083	561,979	1,928,175	21,456,768	142,885	41,328	1,324,356	26,204,544	
2035	711,010	45,534	567,599	1,947,456	21,671,336	144,313	41,741	1,337,600	26,466,589	
<b>TOTAL</b>	<b>27,528,452</b>	<b>1,591,957</b>	<b>18,996,170</b>	<b>71,611,431</b>	<b>783,135,964</b>	<b>4,164,875</b>	<b>1,542,610</b>	<b>51,461,611</b>	<b>960,033,070</b>	

**TABLE B-16A Minimum OMP&R Component of Transportation Charge for Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA										
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Little Rock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District	
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	
1961	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	
1968	65,074	28,085	11,697	2,958	19,291	1,089	24,380	8,173	52,315	14,399	
1969	86,339	70,342	15,522	3,925	25,598	1,445	32,348	10,844	69,419	19,106	
1970	107,807	84,577	19,392	4,904	31,981	1,804	40,391	13,540	86,727	23,865	
1971	178,820	105,979	32,228	8,150	53,151	2,992	66,999	22,459	144,136	39,636	
1972	363,555	202,625	106,740	30,967	176,037	6,601	213,032	48,102	548,123	144,113	
1973	404,661	222,765	121,341	34,674	200,116	7,346	243,320	53,975	724,535	190,156	
1974	434,868	235,528	130,627	37,062	215,432	7,677	262,735	56,383	786,107	207,019	
1975	504,791	289,501	151,031	43,176	249,082	9,082	303,108	65,580	905,424	238,842	
1976	559,013	262,420	160,686	44,454	265,004	10,030	325,512	73,253	964,524	256,570	
1977	675,504	335,749	184,813	47,743	304,792	11,890	381,161	87,355	1,069,446	289,793	
1978	600,343	376,946	187,028	54,156	308,449	10,711	373,192	78,304	1,148,279	300,751	
1979	661,123	349,072	196,264	52,211	323,677	12,124	401,469	87,126	1,125,452	302,508	
1980	858,039	415,571	253,090	71,921	417,398	15,435	508,379	112,853	1,518,405	401,223	
1981	1,001,503	511,087	284,970	73,534	469,970	18,046	588,024	131,992	1,548,350	420,523	
1982	1,128,643	557,494	320,938	89,560	529,292	20,193	649,204	148,012	1,870,559	497,871	
1983	1,744,932	832,687	450,049	119,275	742,218	30,643	922,072	225,793	2,373,149	639,682	
1984	2,105,780	943,524	548,784	150,179	905,055	36,810	1,112,196	271,187	3,018,294	803,394	
1985	2,157,936	1,055,744	584,697	157,841	964,282	38,972	1,191,309	277,250	3,230,403	860,780	
1986	2,311,841	1,102,466	618,750	162,748	1,020,438	40,051	1,268,806	295,987	3,318,638	893,069	
1987	2,366,343	1,032,918	628,222	167,262	1,036,061	41,773	1,283,836	307,844	3,400,838	913,933	
1988	2,303,274	1,042,113	649,276	175,694	1,070,784	40,604	1,321,553	298,438	3,587,873	960,968	
1989	2,280,051	1,088,176	613,266	169,993	1,011,401	39,501	1,240,888	292,775	3,499,964	932,519	
1990	2,636,186	1,275,150	708,829	201,242	1,169,006	45,472	1,424,445	336,069	4,084,211	1,078,392	
1991	2,737,441	1,454,172	763,989	210,644	1,259,974	48,936	1,546,583	358,165	4,348,900	1,150,633	
1992	2,781,586	1,579,025	750,248	198,232	1,237,307	49,829	1,538,733	362,844	4,131,745	1,115,632	
1993	3,109,819	1,689,775	850,589	234,719	1,402,796	56,125	1,722,415	411,539	5,023,595	1,338,111	
1994	2,825,193	1,608,731	794,991	225,121	1,311,100	51,259	1,634,886	376,180	4,794,820	1,267,565	
1995	3,121,440	1,720,649	848,101	231,718	1,398,686	58,749	1,766,297	444,998	4,828,432	1,272,345	
1996	3,093,678	1,966,634	862,720	228,008	1,422,789	56,813	1,817,427	423,444	4,707,473	1,256,549	
1997	3,250,394	1,810,292	918,428	281,067	1,514,687	59,547	1,853,224	446,127	5,705,741	1,477,751	
1998	3,876,512	2,050,254	1,070,517	299,639	1,765,491	73,835	3,207,848	561,246	6,076,375	1,634,942	
1999	3,844,435	2,115,519	1,117,470	312,071	1,842,926	76,123	3,236,412	551,446	6,473,569	1,743,108	
2000	3,764,229	3,393,103	1,041,783	293,534	1,718,108	68,539	3,017,631	596,198	5,915,533	1,582,269	
2001	4,460,647	3,773,299	1,111,907	298,302	1,833,743	80,848	3,288,126	700,006	5,763,300	1,557,417	
2002	3,643,974	3,500,194	1,018,976	282,748	1,680,966	62,632	3,003,252	550,071	5,637,788	1,512,905	
2003	4,120,302	3,445,050	1,138,909	302,841	1,878,111	69,962	3,337,082	616,374	6,695,594	1,629,755	
2004	4,508,483	4,095,241	1,464,215	328,244	1,939,631	77,895	3,476,825	686,195	7,338,291	1,796,212	
2005	3,853,314	3,567,855	5,944,452	291,124	2,262,882	67,166	2,926,205	584,463	6,840,007	1,610,368	
2006	4,118,092	3,277,991	8,494,293	311,029	2,836,011	75,327	3,178,247	645,835	7,042,067	1,705,186	
2007	4,496,413	4,430,001	8,706,305	330,903	2,920,452	79,067	3,352,448	685,101	8,114,235	1,906,645	
2008	4,978,602	5,345,912	9,839,173	376,042	3,330,797	82,956	4,139,350	754,281	9,335,252	2,061,733	
2009	4,585,056	4,504,626	8,736,340	357,605	3,011,610	78,308	3,727,026	694,268	8,990,985	1,999,669	
2010	4,190,297	4,349,051	9,428,454	368,415	3,238,174	73,988	3,800,289	628,220	8,994,428	2,000,716	
2011	4,904,082	4,734,546	10,797,505	416,526	3,662,375	86,138	4,331,240	765,097	9,479,654	2,182,690	
2012	5,504,703	5,278,424	11,448,412	461,506	3,972,155	97,730	4,617,653	842,513	10,537,979	2,398,252	
2013	5,507,937	5,239,876	11,071,878	462,913	4,051,852	97,588	4,969,532	864,516	10,865,640	2,513,425	
2014	<b>5,635,227</b>	<b>5,393,660</b>	<b>11,440,768</b>	<b>454,264</b>	<b>4,122,568</b>	<b>94,040</b>	<b>5,208,753</b>	<b>839,215</b>	<b>11,024,682</b>	<b>2,562,929</b>	
2015	5,458,289	4,883,653	10,379,142	420,394	3,742,977	91,221	4,703,635	806,751	10,180,570	2,324,674	
2016	5,627,111	5,218,477	11,069,534	449,932	4,010,514	95,159	5,078,051	843,860	10,790,428	2,490,799	
2017	5,546,129	5,180,451	11,180,229	448,935	4,050,620	96,111	5,043,738	832,115	10,801,110	2,515,707	
2018	5,601,590	5,232,255	11,292,032	453,424	4,091,126	97,072	5,094,175	840,436	10,909,120	2,540,864	
2019	5,657,606	5,284,578	11,404,952	457,958	4,132,037	98,043	5,145,117	848,840	11,018,212	2,566,273	
2020	5,709,994	5,334,534	11,514,792	462,358	4,171,642	98,954	5,332,292	856,711	11,125,173	2,591,048	
2021	5,767,094	5,387,879	11,629,940	466,981	4,213,359	99,943	5,385,615	865,278	11,236,424	2,616,958	
2022	5,824,765	5,441,758	11,746,239	471,651	4,255,492	100,943	5,439,471	873,931	11,348,789	2,643,128	
2023	5,883,012	5,496,175	11,863,702	476,368	4,298,047	101,952	5,493,865	882,670	11,462,276	2,669,559	
2024	5,941,842	5,551,137	11,982,339	481,131	4,341,028	102,972	5,548,804	891,497	11,576,899	2,696,255	
2025	6,001,261	5,606,648	12,102,162	485,943	4,384,438	104,002	5,604,292	900,412	11,692,667	2,723,217	
2026	6,061,273	5,662,715	12,223,184	490,802	4,428,282	105,042	5,660,335	909,416	11,809,594	2,750,449	
2027	6,121,886	5,719,342	12,345,416	495,710	4,472,565	106,092	5,716,939	918,510	11,927,690	2,777,954	
2028	6,183,105	5,776,535	12,468,870	500,667	4,517,291	107,153	5,774,108	927,695	12,046,968	2,805,733	
2029	6,244,936	5,834,301	12,593,559	505,674	4,562,464	108,224	5,831,849	936,972	12,167,438	2,833,791	
2030	6,307,385	5,892,644	12,719,494	510,731	4,608,088	109,307	5,890,167	946,342	12,289,112	2,862,129	
2031	6,370,459	5,951,570	12,846,689	515,838	4,654,169	110,400	5,949,069	955,805	12,412,003	2,890,750	
2032	6,434,164	6,011,086	12,975,157	520,996	4,700,711	111,504	6,008,560	965,364	12,536,123	2,919,657	
2033	6,498,505	6,071,197	13,104,908	526,206	4,747,718	112,619	6,068,645	975,017	12,661,484	2,948,854	
2034	6,563,490	6,131,909	13,235,957	531,468	4,795,195	113,745	6,129,332	984,767	12,788,099	2,978,343	
2035	6,629,125	6,193,228	13,368,316	536,783	4,843,147	114,882	6,190,625	994,615	12,915,980	3,008,126	
TOTAL	248,881,304	210,606,467	370,685,175	19,670,798	159,144,148	4,358,029	205,964,522	36,648,644	453,437,416	108,860,088	

**TABLE B-16A Minimum OMP&R Component of  
Transportation Charge for Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	42,918
1963	0	0	0	0	0	0	0	0	12,626	168,358
1964	0	0	0	0	0	0	0	0	13,938	184,729
1965	0	0	0	0	0	0	0	0	28,937	378,874
1966	0	0	0	0	0	0	0	0	31,321	408,397
1967	0	0	0	0	0	0	0	0	47,718	634,505
1968	8,821	972,734	9,504	1,218,520	0	0	0	0	46,945	2,745,160
1969	11,704	1,295,607	12,610	1,654,810	0	0	0	0	52,963	4,074,939
1970	14,623	1,624,569	15,746	2,069,923	0	0	0	0	69,744	4,676,282
1971	24,302	2,716,584	26,118	3,421,555	0	0	54	54	55,532	6,185,714
1972	89,131	8,038,463	68,369	10,035,857	0	0	40	40	80,412	12,998,869
1973	117,779	9,890,316	78,313	12,289,296	0	0	1	1	54,219	15,194,233
1974	128,169	11,581,491	83,453	14,166,551	0	0	143	143	76,783	17,372,561
1975	147,899	13,584,548	101,893	16,593,957	0	0	1,069	1,069	84,547	20,517,423
1976	158,664	12,862,489	94,799	16,037,419	0	0	139	139	106,717	20,027,213
1977	178,774	16,203,699	121,966	19,892,683	0	0	892	892	98,618	24,213,489
1978	186,384	17,811,770	132,435	21,568,747	0	0	39	39	100,786	26,012,786
1979	186,688	16,414,289	126,756	20,238,761	0	0	3,235	3,235	119,352	24,675,598
1980	248,399	20,926,898	154,096	25,901,706	0	0	416	416	178,812	32,038,398
1981	259,244	23,731,024	186,592	29,224,860	0	0	3,847	3,847	185,347	35,516,366
1982	307,955	27,994,510	209,141	34,323,374	0	0	11,075	11,075	173,894	41,611,655
1983	394,524	38,953,367	326,258	47,754,649	0	0	1,928	1,928	220,926	56,802,781
1984	496,808	45,597,671	382,104	56,371,786	0	0	3,765	3,765	225,959	67,072,552
1985	531,765	50,064,444	416,652	61,532,075	0	0	2,888	2,888	340,322	73,228,724
1986	551,066	52,858,915	442,334	64,885,109	0	0	2,787	2,787	279,227	76,682,113
1987	564,352	50,737,631	411,276	62,892,287	0	0	2,388	2,388	345,116	75,240,981
1988	593,787	51,262,231	406,248	63,712,844	0	0	545	545	365,207	76,126,695
1989	576,852	52,638,942	431,020	64,815,349	0	0	1,800	1,800	422,329	78,708,338
1990	667,687	61,053,824	494,721	75,175,234	0	0	788	788	474,284	91,448,066
1991	711,803	60,874,529	470,139	75,935,908	0	0	3,654	3,654	214,683	91,098,893
1992	688,558	67,460,598	502,131	82,396,469	0	0	647	647	443,676	100,077,320
1993	828,208	68,749,547	538,751	85,955,990	0	0	3,630	3,630	599,571	107,321,034
1994	783,691	63,898,029	473,897	80,045,461	0	0	2,279	2,279	609,966	101,233,250
1995	785,191	68,079,888	523,512	85,080,005	0	0	2,906	2,906	534,971	107,378,966
1996	773,653	72,757,439	561,100	89,927,727	0	0	8,007	8,007	571,857	113,585,948
1997	917,372	75,655,465	564,455	94,454,555	0	0	7,449	7,449	428,638	114,939,131
1998	1,000,558	80,540,695	608,294	102,766,204	0	0	0	0	465,095	129,072,817
1999	1,069,968	86,588,229	639,739	109,611,015	0	0	(0)	(0)	587,326	137,123,913
2000	970,915	82,749,902	637,349	105,749,093	0	0	0	0	0	131,734,082
2001	950,571	92,952,641	709,077	117,479,883	0	0	(0)	(0)	0	146,314,352
2002	923,874	85,536,695	658,323	108,011,826	0	0	(0)	(0)	0	143,619,940
2003	1,530,707	83,743,943	631,553	109,139,083	0	0	3,393	3,393	0	140,934,901
2004	1,454,954	101,193,271	773,910	129,133,368	0	0	3,455	3,455	0	158,422,007
2005	1,593,616	74,666,478	656,082	104,864,013	0	0	3,452	3,452	0	131,621,724
2006	1,452,707	77,304,788	608,862	111,050,435	0	0	3,867	3,867	0	137,954,117
2007	1,824,577	106,228,514	872,662	143,947,323	0	0	3,691	3,691	0	174,525,819
2008	2,457,590	115,164,110	994,804	158,860,602	0	0	5,179	5,179	0	197,147,456
2009	2,327,357	100,822,035	836,992	140,671,878	0	0	840	840	0	174,024,682
2010	2,523,425	99,874,693	802,552	140,272,702	0	0	1,060	1,060	0	178,061,845
2011	2,576,455	106,460,016	855,464	151,251,788	0	0	2,747	2,747	0	193,360,427
2012	2,377,378	121,583,156	985,031	170,104,892	0	0	1,141	1,141	0	215,410,278
2013	2,736,585	117,328,074	947,292	166,657,107	0	0	41	41	0	211,423,142
2014	2,791,266	115,811,976	935,221	166,314,569	0	0	42	42	0	215,020,627
2015	2,669,055	107,185,076	870,138	153,715,575	0	0	43	43	0	198,890,544
2016	2,758,486	114,459,963	926,257	163,818,570	0	0	42	42	0	210,705,349
2017	2,769,677	113,793,246	935,519	163,193,586	0	0	43	43	0	210,085,404
2018	2,797,374	114,931,179	944,874	164,825,523	0	0	43	43	0	212,186,257
2019	2,825,348	116,080,492	954,323	166,473,779	0	0	44	44	0	214,308,122
2020	2,853,060	117,183,044	963,277	168,196,879	0	0	44	44	0	216,451,201
2021	2,881,590	118,354,873	972,910	169,878,844	0	0	45	45	0	218,615,711
2022	2,910,406	119,538,422	982,639	171,577,633	0	0	45	45	0	220,801,869
2023	2,939,510	120,733,806	992,466	173,293,408	0	0	45	45	0	223,009,884
2024	2,968,905	121,941,144	1,002,390	175,026,342	0	0	46	46	0	225,239,985
2025	2,998,594	123,160,557	1,012,414	176,776,608	0	0	46	46	0	227,492,385
2026	3,028,580	124,392,163	1,022,538	178,544,375	0	0	47	47	0	229,767,311
2027	3,058,865	125,636,085	1,032,764	180,329,819	0	0	47	47	0	232,064,985
2028	3,089,455	126,892,445	1,043,091	182,133,118	0	0	48	48	0	234,385,635
2029	3,120,349	128,161,371	1,053,522	183,954,450	0	0	48	48	0	236,729,494
2030	3,151,552	129,442,983	1,064,057	185,793,991	0	0	49	49	0	239,096,785
2031	3,183,069	130,737,412	1,074,698	187,651,932	0	0	49	49	0	241,487,752
2032	3,214,899	132,044,788	1,085,445	189,528,453	0	0	50	50	0	243,902,631
2033	3,247,049	133,365,235	1,096,300	191,423,737	0	0	50	50	0	246,341,660
2034	3,279,519	134,698,889	1,107,263	193,337,976	0	0	51	51	0	248,805,076
2035	3,312,314	136,045,876	1,118,335	195,271,353	0	0	51	51	0	251,293,123
<b>TOTAL</b>	<b>105,554,007</b>	<b>5,303,619,779</b>	<b>42,774,820</b>	<b>7,270,205,199</b>	<b>0</b>	<b>0</b>	<b>96,294</b>	<b>96,294</b>	<b>8,751,580</b>	<b>9,218,056,552</b>



**TABLE B-16B Minimum OMP&R Component of Transportation Charge  
for Each Contractor for Off-Aqueduct Power Facilities <sup>a</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	10,070	0	10,070	47,473	31,446	863,937	942,856	0	0	0
1984	29,957	0	29,957	157,280	77,388	2,040,188	2,274,856	0	0	0
1985	54,709	0	54,709	458,427	582,679	2,696,450	3,737,556	0	0	0
1986	45,887	0	45,887	312,938	365,147	2,595,765	3,273,850	0	0	0
1987	90,385	0	90,385	622,029	674,111	2,306,079	3,602,219	0	0	0
1988	115,970	114,196	230,166	616,865	804,606	2,116,236	3,537,707	0	0	0
1989	64,584	138,240	202,824	407,353	396,069	1,389,347	2,192,769	0	0	0
1990	77,126	138,805	215,931	535,269	514,372	1,490,250	2,539,891	0	0	0
1991	35,178	245,181	280,359	355,578	477,883	1,065,488	1,898,949	0	165,930	165,930
1992	74,573	230,716	305,289	405,244	529,119	1,183,466	2,117,829	0	0	0
1993	89,214	247,977	337,191	841,383	256,930	1,552,562	2,650,875	0	0	0
1994	111,942	229,598	341,540	501,812	559,683	1,395,238	2,466,733	0	0	0
1995	96,842	235,605	332,447	833,227	492,578	796,524	2,122,329	0	0	0
1996	63,698	205,414	269,112	367,297	304,845	1,189,291	1,861,433	711	105	816
1997	48,518	193,255	241,773	455,751	294,951	1,220,497	1,971,199	44,788	298,986	343,774
1998	82,317	251,217	333,534	380,321	380,282	1,103,662	1,864,265	198,376	1,028,220	1,226,596
1999	58,017	195,562	253,579	559,900	446,655	1,039,572	2,046,127	147,204	791,946	939,150
2000	28,759	128,393	157,152	374,808	237,138	748,820	1,360,766	82,628	474,268	556,896
2001	81,666	157,196	238,862	396,340	233,205	673,431	1,302,976	134,574	595,294	729,868
2002	40,236	127,750	167,986	383,365	229,280	519,819	1,132,464	91,639	583,933	675,572
2003	37,618	92,735	130,353	301,657	180,804	643,729	1,126,190	78,771	477,048	555,819
2004	50,289	128,180	178,469	447,802	210,093	546,342	1,204,237	92,836	662,110	754,946
2005	53,455	149,328	202,783	452,896	265,252	772,420	1,490,568	106,901	587,036	693,937
2006	59,239	127,708	186,947	476,295	277,304	798,098	1,551,697	109,498	605,502	715,000
2007	82,724	182,954	265,678	445,250	246,862	740,211	1,432,323	103,331	759,114	862,445
2008	200,185	304,502	504,687	861,568	428,737	1,074,975	2,365,280	184,501	997,507	1,182,008
2009	167,186	237,569	404,754	708,409	418,456	1,279,442	2,406,307	209,684	853,143	1,062,827
2010	186,503	221,486	407,989	876,092	407,548	1,266,270	2,549,910	203,422	963,122	1,166,544
2011	121,673	145,499	267,172	685,604	372,699	1,174,038	2,232,341	147,645	829,034	976,678
2012	130,096	184,860	314,957	829,512	318,979	1,134,767	2,283,259	185,912	919,491	1,105,403
2013	172,684	168,999	341,683	807,813	394,886	1,339,158	2,541,857	213,704	920,200	1,133,904
2014	<b>60,449</b>	<b>72,570</b>	<b>133,019</b>	<b>283,795</b>	<b>180,454</b>	<b>544,827</b>	<b>1,009,076</b>	<b>61,468</b>	<b>347,867</b>	<b>409,335</b>
2015	27,887	24,560	52,447	114,806	57,485	142,407	314,698	27,808	157,131	184,939
2016	18,838	16,302	35,140	77,553	38,832	96,198	212,582	18,785	106,144	124,928
2017	18,493	15,994	34,487	76,133	38,120	94,436	208,689	18,441	104,200	122,641
2018	7,330	6,364	13,694	30,175	15,720	37,430	83,325	18,723	41,300	60,023
2019	7,314	6,351	13,665	30,112	15,688	37,351	83,151	18,684	41,213	59,898
2020	7,937	6,891	14,828	32,674	17,022	40,529	90,226	20,274	44,720	64,994
2021	11,591	10,064	21,654	47,717	24,859	59,189	131,765	29,608	65,308	94,916
2022	10,973	9,527	20,500	45,175	23,535	56,035	124,745	28,030	61,829	89,859
2023	8,049	6,989	15,038	33,138	17,264	41,104	91,506	20,562	45,354	65,916
2024	6,016	5,224	11,240	24,768	12,903	30,722	68,393	15,368	33,899	49,267
2025	985	855	1,839	4,053	2,112	5,028	11,193	2,515	5,548	8,063
2026	1,235	1,072	2,307	5,083	2,648	6,305	14,035	3,154	6,956	10,110
2027	1,837	1,595	3,432	7,563	3,940	9,381	20,885	4,693	10,351	15,044
2028	1,274	1,106	2,381	5,246	2,733	6,508	14,488	3,255	7,181	10,436
2029	1,268	1,101	2,369	5,220	2,720	6,475	14,415	3,239	7,145	10,384
2030	380	330	710	1,565	815	1,941	4,321	971	2,142	3,112
2031	379	329	708	1,560	813	1,936	4,309	968	2,136	3,104
2032	389	338	726	1,600	834	1,985	4,419	993	2,190	3,183
2033	386	335	720	1,587	827	1,969	4,383	985	2,172	3,157
2034	382	331	713	1,572	819	1,949	4,340	975	2,151	3,126
2035	389	338	727	1,601	834	1,986	4,422	994	2,192	3,185
TOTAL	2,755,080	4,971,489	7,726,569	16,738,254	11,870,964	39,981,764	68,590,982	2,636,618	13,611,116	16,247,734

(a) 2009 through 2015 charges include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

**TABLE B-16B Minimum OMP&R Component of Transportation Charge  
for Each Contractor for Off-Aqueduct Power Facilities <sup>a</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA							
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	159,191	0	34,366	2,964,185	13,174	9,673	3,733	3,184,322
1984	389,518	0	816,103	9,095,509	26,774	33,576	49,601	10,411,081
1985	527,952	59,322	1,053,957	11,978,046	38,810	42,297	1,253,257	14,953,641
1986	552,172	12,858	885,988	11,788,714	40,659	38,275	872,008	14,190,674
1987	450,941	24,936	1,192,388	10,448,063	39,134	37,538	911,938	13,104,938
1988	425,261	31,146	1,130,988	9,910,050	35,851	26,779	850,225	12,410,300
1989	331,852	17,226	607,908	7,400,983	22,959	24,306	754,007	9,159,241
1990	219,381	7,731	428,482	5,216,562	12,089	12,046	344,943	6,241,234
1991	13,048	3,111	570,942	146,276	0	1,354	30,685	765,416
1992	244,630	13,395	706,155	5,788,599	18,587	15,716	480,903	7,267,985
1993	471,706	25,543	1,202,455	11,405,212	37,276	36,803	1,159,908	14,338,903
1994	262,029	15,161	901,463	6,786,208	19,257	19,061	567,521	8,570,700
1995	626,214	16,830	1,486,494	12,489,555	41,275	36,377	1,051,178	15,747,923
1996	407,919	13,446	1,226,968	9,219,091	28,668	24,001	1,691,135	12,611,228
1997	423,144	(6)	794,476	7,471,645	(31)	22,025	137,304	8,848,557
1998	471,993	4,597	837,228	8,366,817	127	25,458	175,371	9,881,591
1999	360,554	19,182	874,948	7,723,883	24,159	20,065	1,749,925	10,772,716
2000	193,895	5,762	392,659	4,215,772	11,530	9,847	667,127	5,496,592
2001	200,485	6,563	113,854	2,948,087	7,528	11,821	287,409	3,575,747
2002	153,306	4,540	308,554	2,797,916	9,223	10,767	299,940	3,584,246
2003	125,188	3,901	301,142	2,626,386	10,030	7,904	287,531	3,362,082
2004	168,005	12,193	457,106	2,914,113	30,989	10,807	278,204	3,871,417
2005	315,142	14,807	358,007	5,609,958	76,490	11,047	540,681	6,926,132
2006	287,977	13,112	401,503	5,488,668	38,075	11,559	432,313	6,673,207
2007	189,684	8,758	242,253	3,662,405	24,280	10,224	365,975	4,503,579
2008	184,682	7,887	381,864	3,930,067	31,949	11,276	282,379	4,830,104
2009	181,200	8,817	63,082	4,518,839	28,827	11,595	314,621	5,126,982
2010	250,194	27,117	96,128	5,774,210	40,474	16,580	488,098	6,692,800
2011	362,592	11,506	290,168	7,797,111	39,939	11,233	338,448	8,850,998
2012	138,937	16,374	280,895	5,986,114	53,705	16,109	654,430	7,146,562
2013	219,747	10,922	471,378	4,452,574	24,561	12,997	297,595	5,489,774
<b>2014</b>	<b>126,236</b>	<b>5,887</b>	<b>278,576</b>	<b>2,652,170</b>	<b>14,835</b>	<b>7,921</b>	<b>236,100</b>	<b>3,321,725</b>
2015	25,116	1,592	83,728	583,502	5,040	2,062	47,174	748,214
2016	15,533	1,075	56,559	394,161	3,404	1,393	31,867	503,993
2017	15,248	1,055	55,523	386,943	3,342	1,368	31,283	494,763
2018	6,044	418	22,446	153,495	1,325	542	12,399	196,669
2019	6,031	417	22,399	153,174	1,322	541	12,373	196,258
2020	6,544	453	24,305	166,206	1,434	587	13,426	212,956
2021	9,557	661	35,495	242,726	2,095	857	19,607	310,998
2022	9,048	626	33,604	229,794	1,983	812	18,562	294,428
2023	6,637	459	24,650	168,564	1,455	595	13,616	215,977
2024	4,961	343	18,424	125,988	1,087	445	10,177	161,425
2025	812	56	3,015	20,618	178	73	1,666	26,418
2026	1,018	70	3,781	25,854	223	91	2,088	33,126
2027	1,515	105	5,626	38,472	332	136	3,108	49,293
2028	1,051	73	3,903	26,688	230	94	2,156	34,194
2029	1,046	72	3,883	26,555	229	94	2,145	34,024
2030	313	22	1,164	7,959	69	28	643	10,198
2031	313	22	1,161	7,937	68	28	641	10,170
2032	321	22	1,190	8,140	70	29	658	10,430
2033	318	22	1,181	8,074	70	29	652	10,344
2034	315	22	1,169	7,994	69	28	646	10,243
2035	321	22	1,191	8,146	70	29	658	10,437
<b>TOTAL</b>	<b>9,546,834</b>	<b>430,232</b>	<b>19,592,875</b>	<b>206,364,779</b>	<b>865,298</b>	<b>606,898</b>	<b>18,080,037</b>	<b>255,486,953</b>

(a) 2009 through 2015 charges include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

**TABLE B-16B Minimum OMP&R Component of Transportation Charge  
for Each Contractor for Off-Aqueduct Power Facilities <sup>a</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley- East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline- Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	1,083,881	411,247	565,798	35,432	894,572	1,250	0	0	233,134	28,548
1984	2,499,848	1,122,640	1,427,428	102,114	2,263,172	77	0	0	502,967	693,074
1985	3,749,257	1,572,025	2,032,672	170,137	3,230,451	0	0	157,601	884,188	601,583
1986	3,159,857	1,694,487	2,097,408	173,460	3,340,188	15,873	0	301,486	739,563	1,088,901
1987	3,167,759	1,694,698	1,991,841	190,149	3,230,424	95,994	1,786	258,719	1,951,799	1,091,691
1988	2,688,113	1,776,471	1,940,156	187,156	3,194,137	30,395	846	126,639	2,000,664	839,774
1989	2,357,669	1,348,806	1,326,863	132,076	2,218,516	50,948	13,206	493,424	1,257,332	792,087
1990	2,528,625	1,335,341	1,463,452	115,746	2,413,745	110,678	0	545,342	1,192,997	1,054,762
1991	1,048,414	531,160	1,022,405	125,256	1,686,304	65,111	473,291	488,207	540,119	796,531
1992	2,760,199	1,548,472	1,124,775	55,985	1,855,065	22,891	1,130,876	367,996	362,232	853,047
1993	3,559,487	1,332,392	2,256,338	29,498	3,721,492	60,615	1,101,799	640,919	425,969	1,406,255
1994	3,963,982	1,450,328	1,345,145	74,879	2,218,411	88,549	1,371,116	678,876	871,358	1,452,741
1995	4,324,009	1,901,361	2,498,462	44,237	4,120,837	43,892	881,146	636,541	75,278	1,397,623
1996	3,572,856	1,507,542	4,652,945	77,384	7,674,388	31,691	760,763	723,670	458,246	1,201,941
1997	3,411,379	1,468,949	4,294,703	42,135	4,319,206	24,319	891,191	648,652	625,340	1,175,556
1998	3,977,988	1,599,394	7,554,910	16,624	6,174,031	30,365	508,248	657,806	166,952	827,650
1999	3,696,973	1,694,851	3,195,685	71,662	3,678,076	18,305	501,486	710,674	815,001	1,375,575
2000	2,372,130	994,396	1,420,806	40,083	1,954,947	0	374,972	257,146	617,664	508,258
2001	2,680,895	1,418,179	460,256	53,460	759,169	0	213,385	445,872	1,339,699	119,363
2002	1,668,457	1,384,832	567,521	74,145	936,215	0	140,035	529,674	2,414,011	841,746
2003	1,445,146	1,353,956	411,258	44,506	678,236	0	405,376	277,984	780,631	624,561
2004	1,813,317	1,677,090	554,874	71,974	760,283	0	465,965	368,929	2,072,770	449,963
2005	2,047,638	1,443,555	1,721,141	32,667	1,987,091	0	542,366	400,828	1,568,493	566,063
2006	2,845,985	1,617,750	5,071,235	26,843	2,093,821	0	1,417,777	442,278	1,533,665	681,916
2007	2,990,954	1,864,667	3,225,680	77,880	1,331,802	0	2,023,088	710,515	2,639,102	177,256
2008	3,547,772	3,303,503	4,059,802	74,029	2,237,582	1,845	2,200,333	1,052,126	3,410,480	629,597
2009	3,350,539	3,010,931	4,067,070	79,671	1,633,327	3,263	2,559,670	1,152,062	3,948,007	1,025,723
2010	4,321,133	2,663,067	7,385,867	31,714	2,730,993	177	3,304,241	810,142	4,668,858	1,673,291
2011	4,952,954	1,811,301	5,605,548	13,018	2,290,872	407	309,065	551,068	2,185,513	1,468,910
2012	5,228,480	2,621,940	8,857,487	38,235	3,465,162	495	848,186	1,240,177	7,385,058	1,676,638
2013	3,620,305	3,283,132	3,342,293	97,414	1,432,952	35,632	1,084,833	687,238	2,614,644	728,407
2014	<b>1,765,796</b>	<b>1,094,558</b>	<b>1,771,229</b>	<b>65,578</b>	<b>1,162,508</b>	<b>20,305</b>	<b>792,304</b>	<b>290,240</b>	<b>1,224,835</b>	<b>465,184</b>
2015	664,760	438,400	769,309	32,251	310,004	10,813	437,187	100,137	570,518	160,145
2016	449,052	296,144	519,676	21,786	209,411	7,304	309,962	67,644	385,391	108,180
2017	440,828	290,721	510,159	21,387	205,576	7,170	296,913	66,405	378,333	106,199
2018	174,723	92,749	202,202	8,477	81,480	2,842	130,004	26,320	149,953	42,092
2019	174,357	91,174	201,779	8,459	81,310	2,836	129,732	26,265	149,639	42,004
2020	189,192	99,574	218,947	9,179	88,228	3,077	141,748	28,499	162,371	45,578
2021	276,294	147,917	319,748	13,405	128,847	4,494	207,007	41,620	237,124	66,561
2022	261,573	142,700	302,712	12,691	121,982	4,255	195,978	39,402	224,491	63,015
2023	191,876	106,414	222,053	9,309	89,479	3,121	143,759	28,904	164,674	46,224
2024	143,412	80,996	165,967	6,958	66,878	2,333	107,448	21,603	123,080	34,549
2025	23,470	13,468	27,161	1,139	10,945	382	17,584	3,535	20,142	5,654
2026	29,430	17,054	34,058	1,428	13,724	479	22,049	4,433	25,257	7,090
2027	43,792	25,675	50,680	2,125	20,422	712	32,810	6,597	37,584	10,550
2028	30,378	17,982	35,156	1,474	14,167	494	22,760	4,576	26,072	7,318
2029	30,227	18,132	34,981	1,467	14,096	492	22,647	4,553	25,942	7,282
2030	9,060	5,496	10,485	440	4,225	147	6,788	1,365	7,776	2,183
2031	9,035	5,573	10,456	438	4,213	147	6,769	1,361	7,754	2,177
2032	9,266	5,799	10,723	450	4,321	151	6,942	1,396	7,952	2,232
2033	9,190	5,835	10,635	446	4,286	149	6,885	1,384	7,887	2,214
2034	9,100	5,860	10,531	441	4,244	148	6,818	1,371	7,810	2,192
2035	9,272	6,055	10,730	450	4,324	151	6,947	1,397	7,958	2,234
TOTAL	99,380,083	55,446,739	92,991,202	2,619,345	83,170,136	804,775	26,576,087	17,131,597	54,234,276	29,079,887

(a) 2009 through 2015 charges include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

**TABLE B-16B Minimum OMP&R Component of Transportation Charge  
for Each Contractor for Off-Aqueduct Power Facilities <sup>a</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				TOTAL STATE WATER PROJECT (b)
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total	
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	12,791,358	0	16,045,220	0	0	0	0	20,182,468
1984	0	39,229,567	0	47,840,887	0	0	0	0	60,556,781
1985	0	77,446,523	0	89,844,437	0	0	0	0	108,590,343
1986	0	77,581,287	0	90,192,510	0	0	0	0	107,702,921
1987	0	68,939,195	0	82,614,055	0	0	0	0	99,411,597
1988	0	79,936,309	0	92,720,660	0	0	0	0	108,898,833
1989	0	68,311,546	0	78,302,473	0	0	0	0	89,857,307
1990	0	83,964,409	277,885	95,002,982	0	0	0	0	104,000,038
1991	0	54,214,229	132,209	61,123,236	0	0	0	0	64,233,890
1992	0	72,401,054	0	82,482,592	0	0	0	0	92,173,695
1993	0	55,312,615	0	69,847,379	0	0	0	0	87,174,348
1994	0	72,838,621	0	86,354,006	0	0	0	0	97,722,979
1995	0	40,862,813	0	56,786,199	0	0	0	0	74,988,898
1996	0	36,536,259	401	57,198,086	0	0	0	0	71,940,675
1997	0	37,121,379	108,559	54,131,368	0	0	0	0	65,536,671
1998	0	30,341,609	149,170	52,004,747	0	0	0	0	65,310,733
1999	0	42,257,580	106,226	58,122,094	0	0	0	0	72,133,666
2000	0	43,977,877	123,318	52,641,597	0	0	0	0	60,213,003
2001	0	49,405,276	84,868	56,980,422	0	0	0	0	62,827,875
2002	0	45,412,974	153,549	54,123,159	0	0	0	0	59,683,427
2003	3,303	41,917,356	129,134	48,071,447	0	0	0	0	53,245,991
2004	44,648	58,676,035	170,851	67,126,699	0	0	0	0	73,135,768
2005	41,448	56,220,579	61,131	66,633,000	0	0	0	0	75,946,420
2006	265,078	60,701,335	70,268	76,767,951	0	0	0	0	85,894,802
2007	248,328	61,354,857	119,861	76,763,990	0	0	0	0	83,828,015
2008	616,986	72,144,765	300,729	93,579,549	0	0	0	0	102,461,628
2009	819,589	71,530,603	313,357	93,493,811	0	0	0	0	102,494,682
2010	1,048,807	88,263,837	322,003	117,224,130	0	0	0	0	128,041,372
2011	954,501	80,381,761	225,564	100,750,481	0	0	0	0	113,077,670
2012	1,225,007	77,943,399	299,148	110,829,412	0	0	0	0	121,679,593
2013	821,008	57,149,063	176,949	75,073,870	0	0	0	0	84,581,088
2014	220,791	30,807,406	169,805	39,850,539	0	0	0	0	44,723,694
2015	142,125	9,625,833	100,871	13,362,353	0	0	0	0	14,662,651
2016	96,013	6,502,351	68,139	9,041,053	0	0	0	0	9,917,696
2017	94,261	6,383,269	66,891	8,868,111	0	0	0	0	9,728,690
2018	37,309	2,593,054	19,884	3,561,088	0	0	0	0	3,914,799
2019	37,253	2,587,634	19,843	3,552,284	0	0	0	0	3,905,256
2020	40,422	2,807,795	21,531	3,856,141	0	0	0	0	4,239,144
2021	59,032	4,100,473	31,444	5,633,967	0	0	0	0	6,193,301
2022	55,887	3,882,004	29,768	5,336,458	0	0	0	0	5,865,991
2023	40,996	2,847,625	21,836	3,916,270	0	0	0	0	4,304,706
2024	30,641	2,128,367	16,321	2,928,552	0	0	0	0	3,218,876
2025	5,014	348,313	2,671	479,478	0	0	0	0	526,990
2026	6,288	436,763	3,349	601,402	0	0	0	0	660,980
2027	9,357	649,922	4,984	895,210	0	0	0	0	983,864
2028	6,491	450,846	3,457	621,172	0	0	0	0	682,671
2029	6,458	448,599	3,440	618,316	0	0	0	0	679,508
2030	1,936	134,458	1,031	185,389	0	0	0	0	203,730
2031	1,930	134,088	1,028	184,970	0	0	0	0	203,261
2032	1,980	137,517	1,055	189,784	0	0	0	0	208,542
2033	1,964	136,390	1,046	188,312	0	0	0	0	206,917
2034	1,944	135,049	1,036	186,542	0	0	0	0	204,964
2035	1,981	137,608	1,055	190,162	0	0	0	0	208,933
<b>TOTAL</b>	<b>6,988,776</b>	<b>1,892,581,435</b>	<b>3,915,665</b>	<b>2,364,920,003</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,712,972,241</b>

(a) 2009 through 2015 charges include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.  
(b) Costs allocated to contractors in 1989 through 2002 are reduced by credits for Off-Aqueduct Power Facility costs allocated to the pumping of non-SWP water.

**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 1 of 5

Calendar Year	NORTH BAY AQUEDUCT						SOUTH BAY AQUEDUCT		CALIFORNIA AQUEDUCT	
	Reach 1 Barker Slough Pumping Plant		Reach 3A Cordelia Pumping Plant Solano County WA		Reach 3B Cordelia Pumping Plant Napa County FC&WCD (a)		Reach 1 South Bay and Del Valle Pumping Plants (b)		Reach 1 Banks Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	4.1511341	4.1511341	0	0
1963	0	0	0	0	0	0	4.5639383	4.5639383	0	0
1964	0	0	0	0	0	0	3.5452154	3.5452154	0	0
1965	0	0	0	0	0	0	4.1911773	4.1911773	0	0
1966	0	0	0	0	0	0	3.5074573	3.5074573	0	0
1967	0	0	0	0	0	0	3.9306767	4.1752198	0	0
1968	0	0	0	0	5.7570017	5.7570017	3.3315620	4.8750942	1.5435322	1.5435322
1969	0	0	0	0	3.1823595	3.1823595	3.6949019	4.8016170	1.1067151	1.1067151
1970	0	0	0	0	3.7584301	3.7584301	4.4256141	5.3721490	0.9465349	0.9465349
1971	0	0	0	0	4.2082507	4.2082507	3.8714396	4.7522833	0.8808437	0.8808437
1972	0	0	0	0	3.9577735	3.9577735	4.3250690	5.2281686	0.9030996	0.9030996
1973	0	0	0	0	3.8103903	3.8103903	5.2455409	6.1841801	0.9386391	0.9386391
1974	0	0	0	0	3.5878850	3.5878850	6.3321503	7.2293909	0.8972406	0.8972406
1975	0	0	0	0	2.1606725	2.1606725	3.7365711	4.8327711	1.0962020	1.0962020
1976	0	0	0	0	2.9283909	2.9283909	4.5191527	5.7132795	1.1941268	1.1941268
1977	0	0	0	0	2.7516411	2.7516411	4.7630172	6.5309908	1.7679736	1.7679736
1978	0	0	0	0	3.5949619	3.5949619	5.2086183	6.8200210	1.6114026	1.6114026
1979	0	0	0	0	2.4747752	2.4747752	4.9524184	7.0944849	2.1420665	2.1420665
1980	0	0	0	0	2.9737588	2.9737588	4.5186576	5.8810391	1.3623815	1.3623815
1981	0	0	0	0	2.6488168	2.6488168	4.3834851	6.4541818	2.0706967	2.0706967
1982	0	0	0	0	10.0222589	10.0222589	5.6383622	7.4005197	1.7621575	1.7621575
1983	0	0	0	0	1.0240490	1.0240490	0.8686401	1.7143948	0.8457546	0.8457546
1984	0	0	0	0	1.6496750	1.6496750	2.7674018	3.9368186	1.1694168	1.1694168
1985	0	0	0	0	2.5224065	2.5224065	3.6942206	5.2987621	1.6045415	1.6045415
1986	0	0	0	0	4.4049446	4.4049446	7.2799222	10.5919298	3.3120077	3.3120077
1987	0	0	0	0	3.5386715	3.5386715	6.4837861	9.2276309	2.7438448	2.7438448
1988	1.1782643	1.1782643	1.1782643	1.1782643	4.4547478	5.6330121	6.1750026	8.8623074	2.6873049	2.6873049
1989	1.2715449	1.2715449	2.5423866	3.8139316	4.1170394	4.2975560	5.5522552	8.1617218	3.5222973	3.5222973
1990	2.0026083	2.0026083	4.2324041	6.2350124	5.8753602	7.8779685	11.7200790	15.8516543	4.1315753	4.1315753
1991	1.2486830	1.2486830	2.6246433	3.8733263	3.8057971	5.0544801	7.5402615	11.2354099	3.6951485	3.6951485
1992	0.7094386	0.7094386	1.4175705	2.1270091	2.3509123	3.0603509	4.0600958	6.3925722	2.3324315	2.3324315
1993	-0.3464574	-0.3464574	-0.6048649	-0.9513223	-1.0200530	-1.3665104	-1.4929934	-1.2571378	0.2358556	0.2358556
1994	1.4600287	1.4600287	2.6570107	4.1170394	4.2975560	5.7575847	7.9510779	11.2405895	3.2895116	3.2895116
1995	0.7544766	0.7544766	1.2974265	2.0519031	2.2753763	3.0298529	3.2312761	5.2610499	2.0297708	2.0297708
1996	1.6427835	1.6427835	2.7704025	4.4131859	4.7993051	6.4420886	8.0186492	11.3633969	3.3447498	3.3447498
1997	1.7801484	1.7801484	3.0246843	4.8048327	5.0575904	6.8373788	9.6521246	12.6148370	2.9627125	2.9627125
1998	-0.3253238	-0.3253238	-0.5570754	-0.8823992	-0.9104311	-1.2357549	-1.8866894	-1.7684350	0.1182544	0.1182544
1999	0.7843563	0.7843563	1.2927037	2.0770600	2.1913971	2.9757534	3.9861234	6.3557474	2.3696240	2.3696240
2000	1.7300176	1.7300176	1.8775164	3.6075340	2.8961448	4.6196324	6.0338390	8.2478290	2.2139900	2.2139900
2001	10.0430980	10.0430980	12.6732715	22.7163696	22.9041445	32.9472425	42.6443270	55.5130485	12.8687216	12.8687216
2002	5.1561098	5.1561098	5.3026984	10.4588082	8.9411156	14.0972254	18.1280636	24.2060285	6.0779649	6.0779649
2003	5.1470505	5.1470505	7.0925479	12.2395984	12.8073799	17.9544304	19.2954367	26.0245482	6.7291116	6.7291116
2004	6.1803231	6.1803231	6.4041145	12.5844682	12.5865996	18.7669227	19.8212463	27.0762480	7.2550017	7.2550017
2005	7.6496541	7.6496541	7.6521314	15.3017855	18.5155450	25.1651991	25.7918365	33.8520540	8.0602175	8.0602175
2006	6.3411515	6.3411515	5.9418551	12.2830066	17.7807425	24.1218940	22.1272863	28.6764964	6.5492101	6.5492101
2007	10.3139095	10.3139095	8.0335196	18.3474291	22.5119243	32.8258338	31.2019321	40.2830549	9.0811229	9.0811229
2008	8.5780412	8.5780412	9.4219804	18.0000216	20.9842547	29.5622960	27.2258607	38.9882711	11.7624104	11.7624104
2009	6.8308567	6.8308567	7.3867111	14.2175677	15.6383889	22.4692455	23.4282879	29.7946495	6.3663617	6.3663617
2010	7.0432977	7.0432977	8.691875	15.6924852	17.9725251	25.0158228	25.8043951	37.0248285	11.2204334	11.2204334
2011	8.5212933	8.5212933	8.8205315	17.3418248	22.9154581	31.4367514	32.3764644	43.6125406	11.2360761	11.2360761
2012	7.9751570	7.9751570	21.8869779	29.8621349	20.1345892	28.1097462	29.6467991	41.4072753	11.7604762	11.7604762
2013	20.3187723	20.3187723	13.9258628	34.2446351	41.2495277	61.5683000	39.4558136	60.1827278	20.7269143	20.7269143
2014	16.4314494	16.4314494	32.0145188	48.4459682	41.5183697	57.9498191	49.2887843	65.5628052	16.2740209	16.2740209
2015	15.0688205	15.0688205	29.3592003	44.4280207	38.0748565	53.1436770	50.6856960	67.6566183	16.9709223	16.9709223
2016	10.5255854	10.5255854	20.7433776	31.2689631	31.4135477	41.9391331	36.7305466	47.4645780	10.7340314	10.7340314
2017	10.5255854	10.5255854	20.7433487	31.2689342	31.3957520	41.9213374	36.7305466	50.5778265	13.8470799	13.8470799
2018	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	45.6977601	8.9445596	8.9445596
2019	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	51.7475677	14.9943671	14.9943671
2020	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	49.3705923	12.6173918	12.6173918
2021	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	50.8732115	14.1200110	14.1200110
2022	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7531932	47.4222636	10.6690704	10.6690704
2023	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	51.1626260	14.4094255	14.4094255
2024	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	49.4361574	12.6829569	12.6829569
2025	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	47.8276636	11.0744631	11.0744631
2026	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	50.8721705	14.1189700	14.1189700
2027	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	44.9792163	8.2260158	8.2260158
2028	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	49.1912175	12.4380170	12.4380170
2029	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	54.5433548	17.7901542	17.7901542
2030	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	47.1453872	10.3921867	10.3921867
2031	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	50.3907418	13.6375413	13.6375413
2032	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	47.2056044	12.9673599	12.9673599
2033	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7531932	51.1760071	14.9628138	14.9628138
2034	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	49.1159812	12.3627807	12.3627807
2035	10.5255854	10.5255854	20.7433852	31.2689706	31.5078071	42.0333926	36.7532005	55.5176965	18.7644960	18.7644960

(a) For the period 1968 through 1987, rates are for an interim facility.

(b) The relatively minor costs of Del Valle Pumping Plant have been combined with those of South Bay Pumping Plant to simplify the allocation procedure.



**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 2 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	Reach 4 Dos Amigos Pumping Plant		Reach 14A Buena Vista Pumping Plant		Reach 15A Teerink Pumping Plant		Reach 16A Chrisman Pumping Plant		Reach 17E Edmonston Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	1.0732031	2.6167353	0	2.6167353	0	2.6167353	0	2.6167353	0	2.6167353
1969	0.7028165	1.8095316	0	1.8095316	0	1.8095316	0	1.8095316	0	1.8095316
1970	0.7813430	1.7278778	0.3333333	2.0612111	0	2.0612111	0	2.0612111	0	2.0612111
1971	0.4125312	1.2933749	1.1407617	2.4341366	0.7218469	3.1559834	0	3.1559834	0	3.1559834
1972	0.5662758	1.4693754	0.8894941	2.3588694	0.8040021	3.1628715	1.8113853	4.9742569	7.3206022	12.2948591
1973	0.5996892	1.5383283	0.8469026	2.3852309	1.0302066	3.4154375	1.8458304	5.2612679	7.4512435	12.7125113
1974	0.5736894	1.4709300	0.8122890	2.2832190	0.9665911	3.2498101	1.7739395	5.0237496	6.9004732	11.9242227
1975	0.4606980	1.5569000	0.7554447	2.3123448	0.8894108	3.2017555	1.8682537	5.0700092	6.9962702	12.0662794
1976	0.5163828	1.7105095	0.9081491	2.6186586	0.9640628	3.5827214	2.1499640	5.7326854	7.9384515	13.6711369
1977	0.6138931	2.3818668	0.9835371	3.3654038	1.2303967	4.5958005	2.7357728	7.3315733	9.9990004	17.3305737
1978	0.4545898	2.0659925	0.9044582	2.9704506	0.9762058	3.9466564	1.8872449	5.8339014	7.0810192	12.9149206
1979	0.6587934	2.8008600	1.0519199	3.8527798	1.1976258	5.0504056	2.6012890	6.1676946	9.6345625	17.2862572
1980	0.8021465	2.1645280	1.3516057	3.5161337	1.5041463	5.0202800	3.1923433	8.2126233	10.9860288	19.1986521
1981	1.0923907	3.1630874	1.2409168	4.4040042	1.3219771	5.7259813	2.9592932	6.8852745	9.9649551	18.6502296
1982	0.8326785	2.5948359	1.2041660	3.7990019	1.3723736	5.1713756	2.8986491	8.0700247	10.2096358	18.2796606
1983	0.3647859	1.2105406	0.7590265	1.9695670	0.8857383	2.8553053	1.7623405	4.6176458	5.086367	10.1262825
1984	0.6581523	1.8275691	1.0533611	2.8809302	1.2188270	4.0995712	6.8408362	6.6405340	8.2344665	14.8750006
1985	0.8726163	2.4771579	1.4204831	3.8976409	1.6516291	5.5492701	3.4695783	9.0188484	11.8181234	20.8369718
1986	1.3996542	4.7116618	2.3713282	7.0829901	2.7567970	9.8397871	5.9534613	15.7932484	20.6010240	36.3942724
1987	1.2912643	3.2326417	1.4836761	6.2695476	1.7077297	8.8155474	5.3141190	14.1296664	17.7628277	31.8924941
1988	1.1947837	3.8820886	2.1129991	5.9950877	2.4017135	8.3968012	5.0055748	13.4023759	16.6001692	30.0025452
1989	1.4935226	5.0158199	2.6947446	7.7105645	3.0084211	10.7189856	6.5499538	17.2689394	22.1795336	39.4484730
1990	1.8962463	6.0278216	3.3080372	9.3358588	3.7483036	13.0841624	8.6832678	21.7674302	31.0405219	52.8079521
1991	1.0437991	4.7389476	2.1132495	6.8521971	2.4154810	9.2676780	5.6823745	14.9500525	20.4744695	35.2425220
1992	0.9002103	3.2326417	1.4836761	4.7163178	1.7077297	6.4240475	3.5445788	9.9686263	12.0459599	22.0145862
1993	0.1605206	0.3963762	-0.1405164	0.2558598	-0.1312944	1.0245654	-0.7754796	-0.6509143	-3.5828989	-4.2338132
1994	1.4208578	4.7103693	2.5100856	7.2204549	2.8029168	10.0233717	6.0772944	16.1006661	21.5000984	37.6007645
1995	0.7974861	2.8272569	1.3474564	4.1747133	1.4945529	5.6692862	3.1250716	8.7943378	10.7461772	19.5405149
1996	1.6726383	5.0173881	2.5952092	7.6125973	2.8425227	10.4551200	6.3087407	16.7638607	22.6420778	39.4059385
1997	1.2769880	4.2397005	2.5012144	6.7409148	2.6893394	9.4302542	6.2890095	15.7192637	23.0714697	38.7907334
1998	-0.2195574	-0.1013030	-0.4232465	-0.5245494	-0.4504610	-0.9750105	-1.0585256	-2.0335361	-3.8077856	-5.8413217
1999	0.8412976	3.2109216	1.4071463	4.6180679	1.2831855	5.9012534	3.4289262	9.3301795	13.6776471	23.0078267
2000	0.8831721	3.0971621	1.5510989	4.6482610	1.7049532	6.3532142	4.0192405	10.3724547	14.7157795	25.0882342
2001	6.1123778	18.9810994	11.2648844	30.2459837	12.3519389	42.5979227	28.5490444	71.1469671	106.8554939	178.0024610
2002	2.6241510	8.7021160	4.6014508	13.3035668	5.0195661	18.3231329	11.6145173	29.9376502	43.1568537	73.0945038
2003	3.1202696	9.8493811	5.5874811	15.4368622	6.0872217	21.5240839	14.1581535	35.6822374	52.6394569	88.3216943
2004	3.3220914	10.5770931	5.8515717	16.4286648	6.3561368	22.7848016	14.8070070	37.5918086	55.0480248	92.6398334
2005	3.8070561	11.8672735	6.8334388	18.7007123	7.4067583	26.1074707	17.2234578	43.3309284	62.0384555	105.3693839
2006	2.9857429	9.5349530	5.5659445	15.1008975	5.9905335	21.0914310	14.0057497	35.0971806	47.7171619	82.8143425
2007	4.4311557	13.5122786	7.9525480	21.4648266	8.6104126	30.0752392	19.9651121	50.0403513	69.3943684	119.4347197
2008	4.4912604	16.2536709	8.4139003	24.6675711	9.8240646	34.4916357	20.3840313	54.8756670	71.9661450	126.8418120
2009	3.4408027	9.8071644	6.2896609	16.0968252	6.9453508	23.0421760	15.3820673	38.4242434	59.5136308	97.9378742
2010	4.2053837	15.4258171	6.9864525	22.4122695	7.5783104	29.9905800	17.3428810	47.3334609	64.1931365	111.5265975
2011	4.7370892	15.9731654	8.1587173	24.1318827	8.7880637	32.9199464	20.2201764	53.1401228	69.3175354	122.4576581
2012	4.8072327	16.5677089	8.5356894	25.1033983	9.2823581	34.3857564	21.5422687	55.9280251	79.8061239	135.7341491
2013	9.0832600	29.8101743	15.4075142	45.2176885	19.0941766	64.3118651	41.4575990	105.7694641	147.1429810	252.9124451
2014	<b>7.0223661</b>	<b>23.2963869</b>	<b>12.5272910</b>	<b>35.8236779</b>	<b>15.2707308</b>	<b>51.0944088</b>	<b>33.0307601</b>	<b>84.1251688</b>	<b>115.6432140</b>	<b>199.7683829</b>
2015	7.2698526	24.2407749	12.9618668	37.2026417	15.8015105	53.0041152	34.1803654	87.1845175	119.7379241	206.9224416
2016	6.4321629	17.1661944	11.6515181	28.8177125	12.6385066	41.4562191	29.3189342	70.7751532	109.0586745	179.8338277
2017	6.1936301	20.0407100	11.0505874	31.0912974	11.9544524	43.0457498	27.7095400	70.7552898	102.9872404	173.7425302
2018	6.5785541	15.5231137	12.0272969	27.5504106	13.0676806	40.6180911	30.3328697	70.9509608	112.8863654	183.8373262
2019	6.2226208	21.2169880	11.1245746	32.3415626	12.0389990	44.3805516	27.9050239	72.2855756	103.7269909	176.0125684
2020	6.3553079	18.9726997	11.4564739	30.4291736	12.4162600	42.8454336	28.7946274	71.6400610	107.0806162	178.7206772
2021	6.3254522	20.4454632	11.3814460	31.8269092	12.3308869	44.1577961	28.5932440	72.7510401	106.3212072	179.0722473
2022	6.3634793	17.0325496	11.4772368	28.5097864	12.4399059	40.9496923	28.8504230	69.8001153	107.2910771	177.0911924
2023	6.4054632	20.8148887	11.5834033	32.3982921	12.5608330	44.9591251	29.1357804	74.0949055	108.3674785	182.4623840
2024	6.3243142	19.0072710	11.3789634	30.3862344	12.3280843	42.7143187	28.5866513	71.3009700	106.2964076	177.5973776
2025	6.3880712	17.4625342	11.5394701	29.0020043	12.5107849	41.5127892	29.0176739	70.5304632	107.9219488	178.4524120
2026	6.2896958	20.4086659	11.2926170	31.7012829	12.2299207	43.9312036	28.3551705	72.2863742	105.4237332	177.7101073
2027	6.4026311	14.6286469	11.5763088	26.2049557	12.5527536	38.7577093	29.1167173	67.8744266	108.2955714	176.1699981
2028	6.3213116	18.7593286	11.3717923	30.1311209	12.3199486	42.4510696	28.5674803	71.0185499	106.2241773	177.2427271
2029	6.3786897	24.1688439	11.5159378	35.6847817	12.4839920	48.1687737	28.9544583	77.1232320	107.6835229	184.8067549
2030	6.2989332	16.6911198	11.3161010	28.0072208	12.2566395	40.2638603	28.4181938	68.6820541	105.6613846	174.3434387
2031	6.6280617	20.2656030	12.1535563	32.4191593	13.2120635	45.6312228	30.6740619	76.3052848	114.1749174	190.4802021
2032	6.1352716	19.1026315	10.9127224	30.0153539	11.7989624	41.8143162	27.3397068	69.1540230	101.5979487	170.7519717
2033	6.6196602	21.5824740	12.1312481	33.7137221	13.1864926	46.9002148	30.6135838	77.5137986	113.9463490	191.4601476
2034	6.1748263	18.5376070	11.0101046	29.5477116	11.9093413	41.4570529	27.5997125	69.0567654	102.5772839	171.6340493
2035	7.0846470	25.8491430	13.3702386	39.2193816	14.6124688	53.8318504	33.9912107	87.8230611	126.7272362	214.5502973

**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 3 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 18A Alamo Powerplant		Reach 22B Pearblossom Pumping Plant		Reach 23 Mojave Siphon Powerplant		Reach 26A Devil Canyon Powerplant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	2.6167353	0	2.6167353	0	2.6167353	0	2.6167353
1969	0	1.8095316	0	1.8095316	0	1.8095316	0	1.8095316
1970	0	2.0612111	0	2.0612111	0	2.0612111	0	2.0612111
1971	0	3.1559834	0	3.1559834	0	3.1559834	0	3.1559834
1972	0	12.2948591	1.9331104	14.2279695	0	14.2279695	-2.3717647	11.8562048
1973	0	12.7125113	3.8751940	16.5877053	0	16.5877053	-8.9027252	7.6849801
1974	0	11.9242227	3.1602116	15.0844343	0	15.0844343	-5.3440968	9.7403376
1975	0	12.0662794	3.0210558	15.0873353	0	15.0873353	-5.7803309	9.3070043
1976	0	13.6711369	3.7579009	17.4290378	0	17.4290378	-6.6439666	10.7850713
1977	0	17.3305737	3.0796474	20.4102211	0	20.4102211	-12.0911833	8.3190378
1978	0	12.9149206	4.0233030	16.9382236	0	16.9382236	-8.2569506	8.6812730
1979	0	17.2862572	5.0776468	22.3639040	0	22.3639040	-9.7140035	12.6499005
1980	0	19.1986521	4.3918283	23.5904804	0	23.5904804	-8.3797007	15.2107797
1981	0	18.6502296	3.9973528	22.6475824	0	22.6475824	-6.7528590	15.8947235
1982	0	18.2796606	3.6829998	21.9626604	0	21.9626604	-6.9238898	15.0387706
1983	0	10.1262825	1.7205305	11.8468130	0	11.8468130	-23.7923457	-11.9455328
1984	0	14.8750006	2.4763871	17.3513877	0	17.3513877	-29.2940447	-11.9426570
1985	0	20.8369718	3.4967556	24.3337274	0	24.3337274	-30.7672356	-6.4335082
1986	-2.3583180	34.0359544	5.9864597	40.0224141	0	40.0224141	-29.2499580	10.7724561
1987	-2.5482255	29.3442686	5.0535029	34.3977715	0	34.3977715	-29.7006534	4.6971181
1988	-1.3847067	28.6178385	4.7392460	33.3570844	0	33.3570844	-29.0334518	4.3236326
1989	-1.1019487	38.3465243	6.4066114	44.7531357	0	44.7531357	-29.3706997	16.3824360
1990	-1.0673268	51.7406253	8.9787944	60.7194197	0	60.7194197	-28.8797266	31.8396931
1991	-1.5206590	33.9038630	6.0785417	39.9824047	0	39.9824047	-30.3294563	9.6529484
1992	-2.6080003	19.4065859	3.6219501	23.0285360	0	23.0285360	-29.7938993	-6.7653633
1993	-0.1885524	-4.4223656	-1.0192774	-5.4416430	0	-5.4416430	-30.6629489	-36.1045919
1994	-0.1279266	37.4728379	6.4513573	43.9241952	0	43.9241952	-30.4781656	13.4460296
1995	-3.4425314	16.0979836	3.3643070	19.4622905	0	19.4622905	-30.3517624	-10.8894719
1996	-5.9839345	33.4220040	6.6794995	40.1015035	-2.3423415	37.7591620	-29.5900574	8.1691046
1997	-4.7847600	34.0059734	6.8397922	40.8457656	-3.8632009	36.9825646	-30.6066647	6.3758999
1998	-5.0614104	-10.9027321	-1.3239652	-12.2266973	-3.7700558	-15.9967531	-30.4293072	-46.4260603
1999	-4.8990186	18.1088081	3.7378677	21.8466757	-5.1563836	16.6902921	-30.2385322	-13.5482400
2000	-5.3488706	19.7393636	4.3552151	24.0945787	-5.1804371	18.9141416	-30.2852311	-11.3710894
2001	-4.6452108	173.3572502	29.9523513	203.3096015	-5.7699537	197.5396478	-30.9018397	166.6378081
2002	-5.4660286	67.6284752	12.9716035	80.6000788	-6.4072101	74.1928686	-30.1661590	44.0267096
2003	-3.3142156	85.0074786	15.4308820	100.4383606	-7.1779336	93.2604270	-30.3892607	62.8711664
2004	-5.5767140	87.0631195	16.1802355	103.2433550	-7.4292488	95.8141062	-30.2389380	65.5751682
2005	-5.5017080	99.8676759	17.8281118	117.6957877	-6.6110924	111.0846953	-30.2932966	80.7907657
2006	-3.1387155	79.6756270	13.7752032	93.4508303	-5.4976224	87.9532078	-29.8005787	58.1526291
2007	-2.7809944	116.6537253	20.2597163	136.9134416	-6.1785168	130.7349248	-30.0961198	100.6388051
2008	-5.4028716	121.4389403	20.2854899	141.7244302	-6.0198040	135.7046262	-30.7631237	104.9415025
2009	-6.3446583	91.5932159	20.0022612	111.5954771	-5.4878080	106.1076691	-33.3163093	72.7913598
2010	-5.1259757	106.4006218	18.6436352	125.0442570	-6.4398404	118.6044166	-28.6783430	89.9260736
2011	-5.2115716	117.2460865	20.3923160	137.6384025	-7.1290888	130.5093137	-29.9982569	100.5110568
2012	-9.6146933	126.1194558	23.9571137	150.0765695	-11.5041724	138.5723971	-30.7147176	107.8576795
2013	-9.5413124	243.3711328	55.9460981	299.3172309	-24.1514715	275.1657594	-51.3154316	223.8503278
2014	<b>-8.5354440</b>	<b>191.2329389</b>	<b>35.9982909</b>	<b>227.2312298</b>	<b>-14.7200245</b>	<b>212.5112053</b>	<b>-31.2363551</b>	<b>181.2748502</b>
2015	-8.5557486	198.3666930	37.2509498	235.6176427	-14.8278700	220.7897728	-32.1705577	188.6192151
2016	-9.4291091	170.4047186	31.1603977	201.5651163	-13.7245059	187.8406104	-30.4352434	157.4053670
2017	-8.8695728	164.8729575	29.0001704	193.8731279	-12.7459867	181.1271411	-29.9727916	151.1543496
2018	-9.7274480	174.1098781	31.5304581	205.6403362	-14.2152487	191.4250876	-31.1836112	160.2414763
2019	-8.9380401	167.0745263	28.6778413	195.7523676	-12.8614756	182.8908921	-29.7782600	153.1126320
2020	-9.2413918	169.4792854	29.7504499	199.2297353	-13.4079188	185.8218165	-31.0861440	154.7356725
2021	-9.2386349	169.8336124	29.6725515	199.5061640	-13.3707894	186.1353746	-30.4351394	155.7002352
2022	-9.2606378	167.8305546	29.7519230	197.5824776	-13.4086211	184.1738565	-29.9116021	154.2622544
2023	-9.3928828	173.0695002	30.2821145	203.3516147	-13.6616397	189.6899751	-30.7405757	158.9493994
2024	-9.0316101	168.5657674	28.9296458	197.4954133	-13.0172419	184.4781714	-30.3951255	154.0830459
2025	-9.3387617	169.1136503	30.0343042	199.1479544	-13.5433139	185.6046406	-30.2481371	155.3565034
2026	-9.0879605	168.6221468	29.1980774	197.8208542	-13.1451707	184.6756836	-30.5650504	154.1106332
2027	-9.2871096	166.8828884	29.8483666	196.7312550	-13.4546067	183.2766484	-30.3923815	152.8842669
2028	-9.1899355	168.0527916	29.4984936	197.5512852	-13.2878632	184.2634220	-30.6233234	153.6400986
2029	-9.2219354	175.5848195	29.6652950	205.2501145	-13.3673299	191.8827846	-30.3111861	161.5715985
2030	-9.1479469	165.1954918	29.3480188	194.5435106	-13.2162185	181.3272922	-30.4092294	150.9180628
2031	-9.5303509	180.9498512	30.7287654	211.6786166	-13.8751962	197.8034205	-30.4951500	167.3082704
2032	-8.8130846	161.9388871	28.2148016	190.1536887	-12.6780111	177.4756776	-29.7289089	147.7467687
2033	-9.6010623	181.8590853	30.9857662	212.8448515	-13.9982439	198.8466076	-31.3297884	167.5168191
2034	-8.9668174	162.6672318	28.6993428	191.3665746	-12.9078490	178.4587257	-29.6276951	148.8310306
2035	-9.7023064	204.8479909	31.4096039	236.2575947	-14.2014397	222.0561550	-31.6531333	190.4030218

**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 4 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 2B (EBX) Greenspot Pumping Plant		Reach 3A (EBX) Crafton Hills Pumping Plant		Reach 4B (EBX) Cherry Valley Pumping Plant		Reach 29A Oso Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	2.6167353	0	2.6167353	0	2.6167353	0	2.6167353
1969	0	1.8095316	0	1.8095316	0	1.8095316	0	1.8095316
1970	0	2.0612111	0	2.0612111	0	2.0612111	0	2.0612111
1971	0	3.1559834	0	3.1559834	0	3.1559834	0	3.1559834
1972	0	11.8562048	0	11.8562048	0	11.8562048	1.1017349	13.3965941
1973	0	7.6849801	0	7.6849801	0	7.6849801	0.7905574	13.5030687
1974	0	9.7403376	0	9.7403376	0	9.7403376	0.7530214	12.8772442
1975	0	9.3070043	0	9.3070043	0	9.3070043	0.8405850	12.9068644
1976	0	10.7850713	0	10.7850713	0	10.7850713	0.7771828	14.4483197
1977	0	8.3190378	0	8.3190378	0	8.3190378	0.6152458	17.9458194
1978	0	8.6812730	0	8.6812730	0	8.6812730	0.5222831	13.4372037
1979	0	12.6499005	0	12.6499005	0	12.6499005	0.7045701	17.9908273
1980	0	15.2107797	0	15.2107797	0	15.2107797	1.4269064	20.6255585
1981	0	15.8947235	0	15.8947235	0	15.8947235	1.5684309	20.2186605
1982	0	15.0387706	0	15.0387706	0	15.0387706	1.4942585	19.7739190
1983	0	-11.9455328	0	-11.9455328	0	-11.9455328	1.2818887	11.4081712
1984	0	-11.9426570	0	-11.9426570	0	-11.9426570	1.7796296	16.6546302
1985	0	-6.4335082	0	-6.4335082	0	-6.4335082	2.1683838	23.0053556
1986	0	10.7724561	0	10.7724561	0	10.7724561	3.2288411	39.6231134
1987	0	4.6971181	0	4.6971181	0	4.6971181	3.1272967	35.0197908
1988	0	4.3236326	0	4.3236326	0	4.3236326	2.9878581	32.9904032
1989	0	16.3824360	0	16.3824360	0	16.3824360	3.5262089	42.9746819
1990	0	31.8396931	0	31.8396931	0	31.8396931	3.6810660	56.4890182
1991	0	9.6529484	0	9.6529484	0	9.6529484	2.1853025	37.6098245
1992	0	-6.7653633	0	-6.7653633	0	-6.7653633	1.9048343	23.9194204
1993	0	-36.1045919	0	-36.1045919	0	-36.1045919	0.1569728	-4.0768404
1994	0	13.4460296	0	13.4460296	0	13.4460296	3.0638504	40.6646149
1995	0	-10.8894719	0	-10.8894719	0	-10.8894719	1.5724835	21.1129984
1996	0	8.1691046	0	8.1691046	0	8.1691046	3.1318961	42.5378346
1997	0	6.3758999	0	6.3758999	0	6.3758999	2.7928728	41.5836062
1998	0	-46.4260603	0	-46.4260603	0	-46.4260603	-0.3226129	-6.1639346
1999	0	-13.5482400	0	-13.5482400	0	-13.5482400	1.8332567	24.8410833
2000	0	-11.3710894	0	-11.3710894	0	-11.3710894	1.7274598	26.8156940
2001	0	166.6378081	0	166.6378081	0	166.6378081	13.4927370	191.4951981
2002	0	44.0267096	0	44.0267096	0	44.0267096	4.8843428	77.9788467
2003	0	62.8711664	0	62.8711664	0	62.8711664	6.1265493	94.4482436
2004	20.6296577	86.2048259	21.3995735	107.6043994	8.6460880	116.2504874	6.4523495	99.0921829
2005	18.8688199	99.6595856	17.9554272	117.6150128	3.7103613	121.3253741	7.2999794	112.6693633
2006	17.8994354	76.0520645	22.1237217	98.1757862	23.2019703	121.3777565	5.3707600	88.1851025
2007	22.1898981	122.8287031	29.3753773	152.2040804	81.5764972	233.7805776	8.2358479	127.6705676
2008	18.8433579	123.7848604	25.2833027	149.0681631	10.4169482	159.4851113	8.9214655	135.7632775
2009	17.1774511	89.9688109	22.5341943	112.5030051	5.1665753	117.6695805	6.4526967	104.3905709
2010	17.8554944	107.7815680	24.3519243	132.1334923	3.9356201	136.0691124	7.8834238	119.4100212
2011	18.5693258	119.0803826	24.9239508	144.0043334	3.8204047	147.8247381	8.2614343	130.7190924
2012	31.1496042	139.0072837	38.8744200	177.8817037	8.0109200	185.8926237	9.4020208	145.1361699
2013	38.7526278	262.6029555	48.3628973	310.9658528	10	320.9321050	14.8718515	267.7842967
2014	40.7686898	222.0435400	50.8789017	272.9224418	10.4846460	283.4070877	14.5750367	214.3434195
2015	42.3188825	230.9380975	52.8134875	283.7515850	11	294.6349772	15.1062927	222.0287342
2016	41.6300578	199.0354248	51.9539499	250.9893747	0	250.9893747	12.7071867	192.5410145
2017	41.6300578	192.7844074	51.9539499	244.7383573	0	244.7383573	12.0546130	185.7971432
2018	41.6300578	201.8715341	51.9539499	253.8254840	0	253.8254840	13.2243814	197.0617076
2019	41.6300578	194.7426898	51.9539499	246.6966397	0	246.6966397	12.1437352	188.1563016
2020	41.6300578	196.3657303	51.9539499	248.3196802	0	248.3196802	12.4663029	191.1869801
2021	41.6300578	197.3302930	51.9539499	249.2842429	0	249.2842429	12.2812079	191.3534552
2022	41.6300578	195.8923122	51.9539499	247.8462621	0	247.8462621	12.5309969	189.6221893
2023	41.6300578	200.5794572	51.9539499	252.5334071	0	252.5334071	12.5376101	194.9999941
2024	41.6300578	195.7131037	51.9539499	247.6670536	0	247.6670536	12.7494518	190.3468293
2025	41.6300578	196.9865612	51.9539499	248.9405111	0	248.9405111	12.5521480	191.0045600
2026	41.6300578	195.7406910	51.9539499	247.6946409	0	247.6946409	12.2970887	190.0071960
2027	41.6300578	194.5143247	51.9539499	246.4682746	0	246.4682746	12.7851337	188.9551318
2028	41.6300578	195.2701564	51.9539499	247.2241063	0	247.2241063	12.3590265	189.6017536
2029	41.6300578	203.2016563	51.9539499	255.1556062	0	255.1556062	12.7089347	197.5156895
2030	41.6300578	192.5481206	51.9539499	244.5020705	0	244.5020705	12.2788960	186.6223347
2031	41.6300578	208.9383282	51.9539499	260.8922781	0	260.8922781	14.1249290	204.6051311
2032	41.6300578	189.3768265	51.9539499	241.3307764	0	241.3307764	11.7313579	182.4833296
2033	41.6300578	209.1468769	51.9539499	261.1008268	0	261.1008268	13.8620466	205.3221942
2034	41.6300578	190.4610884	51.9539499	242.4150383	0	242.4150383	11.7386486	183.3726979
2035	41.6300578	232.0330796	51.9539499	283.9870295	0	283.9870295	18.6233017	233.1735990

**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 5 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 29G Warne Powerplant		Reach 29J Castaic Powerplant		Reach 31A Las Perillas & Badger Hill Pumping Plants		Reach 33A Devil's Den, Bluestone, and Polonio Pass Pumping Plants	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	2.6167353	0	2.6167353	1.5014866	4.1182219	0	4.1182219
1969	0	1.8095316	0	1.8095316	1.2624066	3.0719381	0	3.0719381
1970	0	2.0612111	0	2.0612111	1.6309699	3.3588477	0	3.3588477
1971	0	3.1559834	0	3.1559834	1.4985537	2.7919286	0	2.7919286
1972	0	13.3965941	-2.9350830	10.4615111	1.9517720	3.4211474	0	3.4211474
1973	0	13.5030687	-6.8099448	6.6931239	1.5374531	3.0757814	0	3.0757814
1974	0	12.6772442	-7.4013274	5.2759168	1.5168982	2.9878282	0	2.9878282
1975	0	12.9068644	-6.5604921	6.3463723	1.1130304	2.6699305	0	2.6699305
1976	0	14.4483197	-6.7213324	7.7269873	1.5685447	3.2790543	0	3.2790543
1977	0	17.9458194	-30.4985994	-12.5527800	1.7573375	4.1392043	0	4.1392043
1978	0	13.4372037	-9.0130187	4.4241850	1.9429506	4.0089431	0	4.0089431
1979	0	17.9908273	-19.0478097	-1.0569824	1.5600341	4.3608941	0	4.3608941
1980	0	20.6255585	-20.5438586	0.0816999	1.5124754	3.6770034	0	3.6770034
1981	0	20.2186605	-10.0059379	10.2127225	1.5414199	4.7045073	0	4.7045073
1982	-2.1714430	17.6024760	-9.5987314	8.0037446	1.7581649	4.3530008	0	4.3530008
1983	-8.9130752	2.4950960	-39.8193120	-37.3242160	0.1782765	1.3888171	0	1.3888171
1984	-15.0246012	1.6300290	-17.3126964	-15.6826674	0.8546712	2.6822403	0	2.6822403
1985	-14.7115359	8.2938197	-38.9450629	-30.6512432	1.2014351	3.6785929	0	3.6785929
1986	-14.1893653	25.4337481	-28.1596224	-2.7258742	2.2635886	6.9752505	0	6.9752505
1987	-14.8696165	20.1501743	-27.0536484	-6.9034741	1.9135072	5.9486162	0	5.9486162
1988	-14.7032843	18.2871189	-25.6857024	-7.3985835	1.7733386	5.6554272	0	5.6554272
1989	-14.4231503	28.5515316	-25.3986130	3.1529186	2.4159040	7.4317239	0	7.4317239
1990	-14.1850383	42.3039798	-26.0776142	16.2263657	3.7962150	9.8240367	0	9.8240367
1991	-14.7118704	22.8979541	-25.0234633	-2.1255092	2.4131016	7.1520492	0	7.1520492
1992	-14.6199430	9.2994774	-25.1951357	-15.8956583	1.2766372	4.5092789	0	4.5092789
1993	-10.3386607	-14.4155011	-21.1218973	-35.5373984	-1.1726172	-0.7762411	0	-0.7762411
1994	-14.7696788	25.8949361	-26.7437304	-0.8487943	2.3645104	7.0748798	0	7.0748798
1995	-12.2705974	8.8424010	-25.6907993	-16.8483983	2.5750402	5.4022971	0	5.4022971
1996	-14.8515762	27.6862584	-29.5639188	-1.8776604	2.5837041	7.6010922	0	7.6010922
1997	-14.9272063	26.6563999	-27.1541858	-0.4977859	2.7029648	6.9426653	24.4572499	31.3999152
1998	-8.6695834	-14.8335180	-22.2303491	-37.0638671	-0.5072304	-0.6085333	-4.1828906	-4.7914239
1999	-14.9340263	9.9070570	-27.0443818	-17.1373248	1.3343489	4.5452705	9.5757906	14.1210611
2000	-14.1657261	12.6499679	-26.9670096	-14.3170418	1.8229550	4.9201171	13.5385990	18.4587161
2001	-16.7349304	174.7602677	-29.2914159	145.4688518	12.3088319	31.2899313	93.1086637	124.3989550
2002	-13.2004543	64.7783923	-23.7780808	41.0003115	5.4523570	14.1544730	42.2356453	56.3901183
2003	-13.9757172	80.4725264	-23.8496317	56.6228947	6.3022279	16.1516090	48.5640992	64.7157082
2004	-14.1574758	84.9347071	-25.2967499	59.6379572	6.4411290	17.0182221	52.3954777	69.4136998
2005	-14.2938796	98.3754837	-24.7472457	73.6282381	8.1479703	20.0152438	61.7293566	81.7445984
2006	-14.0865037	74.0985988	-23.8861273	50.2124715	7.0959852	16.6309382	50.0974218	66.7283600
2007	-12.5169061	115.1536615	-25.0603889	90.0932727	9.7647006	23.2769792	72.3039418	95.5809210
2008	-13.8809446	121.8823329	-29.0198140	92.8625189	9.9459461	26.1996169	75.4497912	101.6494082
2009	-10.4812491	93.9093218	-25.6776114	68.2317103	7.4764895	17.2836538	69.2085888	86.4922426
2010	-13.8211960	105.5888253	-26.2504816	79.3383437	8.8037990	24.2296161	75.1200209	99.3496370
2011	-14.1584994	116.5605930	-28.7386599	87.8219331	10.4966279	26.4697933	100.0526045	126.5223977
2012	-14.0675847	131.0685852	-25.2173422	105.8512431	9.7766263	26.3443353	75.6446385	101.9889737
2013	-16.2526687	251.5316279	-27.6273942	223.9042337	18.1055433	47.9157176	127.5144739	175.4301915
2014	-15.6434784	198.6999412	-26.0027956	172.6971456	15.9144828	39.2108698	114.1883466	153.3992164
2015	-16.0000379	206.0286964	-26.0079663	180.0207300	16.3775790	40.6183539	118.9759384	159.5939523
2016	-16.0259452	176.5150693	-24.0531973	152.4618720	6.4909555	23.6571499	112.7740768	136.4312267
2017	-15.2033363	170.5938069	-22.7940431	147.7997638	6.4909555	26.5316655	112.7740768	139.3057423
2018	-16.4918832	180.5698244	-25.0891864	155.4806379	7.0185567	22.5416704	112.7740803	135.3157507
2019	-15.1415372	173.0147644	-22.9936882	150.0210762	7.0185567	28.2355447	112.7740803	141.0096250
2020	-15.5457675	175.6412126	-23.6182939	152.0229187	7.0185567	25.9912564	112.7740803	138.7653367
2021	-15.3109820	176.0424733	-23.2593917	152.7830815	7.0185567	27.4640199	112.7740803	140.2381002
2022	-15.6213173	174.0008719	-23.7429243	150.2579476	7.0185567	24.0511063	112.7740803	136.8251866
2023	-15.6277318	179.3722622	-23.7553889	155.6168734	7.0185567	27.8334454	112.7740803	140.6075257
2024	-15.8919867	174.4548427	-24.1656995	150.2891431	7.0185567	26.0258277	112.7740803	138.7999080
2025	-15.6404149	175.3641451	-23.7828148	151.5813304	7.0185567	24.4810909	112.7740803	137.2551712
2026	-15.3204600	174.6867360	-23.2885319	151.3982041	7.0185567	27.4272226	112.7740803	140.2013029
2027	-15.9259270	173.0292047	-24.2340229	148.7951819	7.0185567	21.6472036	112.7740803	134.4212839
2028	-15.3921778	174.2095758	-23.4080124	150.8015635	7.0185567	25.7778853	112.7740803	138.5196566
2029	-15.8231870	181.6925026	-24.0857073	157.6067952	7.0185567	31.1874006	112.7740803	143.9614809
2030	-15.2847397	171.3375950	-23.2523334	148.0852616	7.0185567	23.7096765	112.7740803	136.4837568
2031	-17.5835122	187.0216189	-26.8372338	160.1843851	7.0185567	27.2841597	112.7740803	140.0582400
2032	-14.5901370	167.8931925	-22.1928873	145.7003053	7.0185567	26.1211882	112.7740803	138.8952685
2033	-17.2459691	188.0762251	-26.3242701	161.7519550	7.0185567	28.6010307	112.7740803	141.3751110
2034	-14.5931386	168.7795593	-22.2064219	146.5731374	7.0185567	25.5561637	112.7740803	138.3302440
2035	-23.1833559	209.9902431	-35.6707528	174.3194903	7.0185567	32.8676997	112.7740803	145.6417800

## Tables B-18 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.



**TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	2,051	34,919	0	36,970	0	0	0
1963	0	0	0	7,900	49,811	0	57,711	0	0	0
1964	0	0	0	5,931	68,203	0	74,134	0	0	0
1965	0	0	0	10,918	68,765	62,926	142,609	0	0	0
1966	0	0	0	19,330	52,135	121,141	192,605	0	0	0
1967	0	0	0	19,958	53,785	163,255	236,998	0	0	0
1968	6,989	0	6,989	29,899	120,985	341,768	492,653	0	0	0
1969	8,551	0	8,551	31,859	3,904	298,968	334,730	0	0	0
1970	13,598	0	13,598	49,687	0	431,443	481,130	0	0	0
1971	10,609	0	10,609	23,842	28,328	416,329	468,499	0	0	0
1972	14,434	0	14,434	54,838	144,669	524,208	723,714	0	0	0
1973	14,449	0	14,449	18,398	15,590	547,807	581,795	0	0	0
1974	17,473	0	17,473	9,499	29	636,186	645,715	0	0	0
1975	14,779	0	14,779	22,318	4,765	425,284	452,367	0	0	0
1976	20,856	0	20,856	97,874	121,693	502,769	722,336	0	0	0
1977	22,635	0	22,635	82,578	123,044	497,792	703,414	0	0	0
1978	21,692	0	21,692	74,911	39,986	652,860	767,757	0	0	0
1979	16,237	0	16,237	137,101	77,145	652,629	866,875	0	0	0
1980	19,945	0	19,945	98,743	64,891	517,531	681,165	0	0	0
1981	23,842	0	23,842	126,437	141,456	567,968	835,862	0	0	0
1982	12,157	0	12,157	97,117	46,742	651,246	795,104	0	0	0
1983	2,342	0	2,342	8,171	5,412	148,743	162,326	0	0	0
1984	4,822	0	4,822	26,707	13,141	349,314	389,163	0	0	0
1985	10,188	0	10,188	79,863	102,790	466,291	648,944	0	0	0
1986	15,501	0	15,501	112,370	131,118	932,090	1,175,577	0	0	0
1987	27,223	0	27,223	216,211	234,290	812,631	1,263,131	0	0	0
1988	31,265	11,533	42,798	229,578	297,129	779,537	1,306,245	0	0	0
1989	37,874	66,850	104,724	306,533	304,275	1,051,562	1,662,370	0	0	0
1990	54,736	105,421	160,157	524,114	502,545	1,456,008	2,482,667	0	0	0
1991	8,159	18,824	26,983	105,736	142,105	316,839	564,680	0	(2,636)	(2,636)
1992	12,515	23,808	36,323	93,772	122,436	273,849	490,058	0	0	0
1993	(7,223)	(17,293)	(24,516)	(36,162)	(12,912)	(78,024)	(127,098)	0	0	0
1994	39,106	77,257	116,363	231,800	257,533	642,006	1,131,340	0	0	0
1995	15,701	36,724	52,425	160,663	93,610	151,287	405,560	0	0	0
1996	31,526	96,570	128,096	214,883	186,694	735,431	1,137,008	502	0	502
1997	29,683	116,555	146,238	351,185	219,799	912,861	1,483,845	34,932	233,584	268,516
1998	(6,622)	(19,825)	(26,447)	(8,777)	(18,989)	(72,459)	(100,225)	(17,211)	(89,207)	(106,418)
1999	15,783	52,547	68,330	251,523	188,675	432,833	873,031	52,855	284,356	337,211
2000	22,904	104,450	127,354	360,156	227,824	718,954	1,306,935	73,133	419,770	492,903
2001	307,892	597,483	905,375	1,693,190	999,457	2,476,925	5,169,572	532,799	2,356,856	2,889,655
2002	96,918	303,383	400,302	1,067,733	640,899	3,162,575	5,169,572	245,579	1,558,397	1,803,976
2003	137,228	293,129	430,357	1,077,542	648,145	2,302,401	4,028,088	288,179	1,745,253	2,033,432
2004	151,816	410,075	561,891	1,322,362	623,001	1,609,900	3,555,263	289,108	2,061,934	2,351,042
2005	198,923	444,172	643,095	1,474,474	843,629	2,478,455	4,796,559	347,496	1,908,246	2,255,742
2006	185,423	343,688	529,111	1,255,253	709,977	2,100,005	4,065,234	280,860	1,553,103	1,833,962
2007	357,067	720,933	1,078,000	1,588,467	887,435	2,667,534	5,143,437	360,914	2,651,415	3,012,328
2008	392,341	547,572	939,913	1,490,471	730,373	1,845,473	4,066,316	345,811	1,869,638	2,215,449
2009	244,782	333,329	578,111	926,226	550,641	1,706,504	3,183,371	328,744	1,336,357	1,665,101
2010	309,969	336,033	646,002	1,472,079	684,494	2,111,915	4,268,489	373,257	1,765,940	2,139,196
2011	355,126	351,395	706,520	1,864,333	1,005,172	3,154,700	6,024,206	483,189	2,703,996	3,187,185
2012	297,179	422,440	719,619	1,983,590	752,689	2,689,352	5,425,631	456,091	2,252,003	2,708,094
2013	944,704	785,227	1,729,931	2,821,426	1,308,072	4,414,866	8,544,364	937,850	3,951,916	4,889,766
<b>2014</b>	<b>1,009,196</b>	<b>659,632</b>	<b>1,668,828</b>	<b>2,748,674</b>	<b>1,538,655</b>	<b>3,933,768</b>	<b>8,221,098</b>	<b>740,918</b>	<b>4,186,571</b>	<b>4,927,490</b>
2015	925,497	815,037	1,740,534	3,272,618	1,637,131	4,059,397	8,969,147	770,839	4,355,638	5,126,477
2016	730,370	562,365	1,292,735	2,295,909	1,148,781	2,847,875	6,292,565	658,963	3,723,481	4,382,444
2017	730,060	562,012	1,292,072	2,446,490	1,226,858	3,034,658	6,708,006	672,847	3,801,932	4,474,779
2018	732,012	564,232	1,296,244	2,210,446	1,151,584	2,741,866	6,103,896	1,674,262	3,693,037	5,367,299
2019	732,012	564,232	1,296,244	2,503,082	1,304,039	3,104,854	6,911,974	1,744,712	3,848,435	5,593,147
2020	732,012	564,232	1,296,244	2,388,105	1,244,139	2,962,236	6,594,479	1,716,944	3,787,184	5,504,127
2021	732,012	564,232	1,296,244	2,460,788	1,282,005	3,052,393	6,795,186	1,735,166	3,827,378	5,562,544
2022	732,012	564,232	1,296,244	2,293,862	1,195,041	2,845,336	6,334,239	1,692,938	3,734,233	5,427,171
2023	732,012	564,232	1,296,244	2,474,787	1,289,298	3,069,758	6,833,843	1,739,737	3,837,461	5,577,198
2024	732,012	564,232	1,296,244	2,391,276	1,245,791	2,966,169	6,603,237	1,717,371	3,788,127	5,505,498
2025	732,012	564,232	1,296,244	2,313,472	1,205,257	2,869,660	6,388,389	1,698,258	3,745,968	5,444,226
2026	732,012	564,232	1,296,244	2,460,738	1,281,979	3,052,330	6,795,047	1,734,711	3,826,374	5,561,085
2027	732,012	564,232	1,296,244	2,175,690	1,133,476	2,698,753	6,007,919	1,663,195	3,668,626	5,331,820
2028	732,012	564,232	1,296,244	2,379,428	1,239,619	2,951,473	6,570,520	1,714,303	3,781,360	5,495,664
2029	732,012	564,232	1,296,244	2,638,317	1,374,493	3,272,601	7,285,410	1,781,235	3,928,997	5,710,232
2030	732,012	564,232	1,296,244	2,280,470	1,188,064	2,828,723	6,297,257	1,688,714	3,724,915	5,413,628
2031	732,012	564,232	1,296,244	2,437,451	1,269,847	3,023,445	6,730,742	1,732,941	3,822,469	5,555,410
2032	732,012	564,232	1,296,244	2,405,033	1,252,958	2,983,234	6,641,225	1,718,551	3,790,730	5,509,281
2033	732,012	564,232	1,296,244	2,501,555	1,303,243	3,102,960	6,907,759	1,749,234	3,858,410	5,607,644
2034	732,012	564,232	1,296,244	2,375,789	1,237,723	2,946,959	6,560,471	1,711,560	3,775,309	5,486,869
2035	732,012	564,232	1,296,244	2,685,447	1,399,046	3,331,062	7,415,554	1,802,026	3,974,855	5,776,881
<b>TOTAL</b>	<b>21,134,427</b>	<b>19,317,507</b>	<b>40,451,934</b>	<b>78,426,089</b>	<b>42,791,332</b>	<b>116,733,342</b>	<b>237,950,763</b>	<b>39,273,512</b>	<b>113,042,410</b>	<b>152,315,922</b>

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

**TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	68,977	5,176	0	0	440,922	2,355	4,760	65,680	587,871
1969	56,774	101	0	0	321,387	181	3,338	17,956	399,737
1970	69,818	6,811	0	0	470,867	0	5,595	16,550	569,641
1971	53,097	7,747	0	0	731,754	4,785	6,353	158,419	962,156
1972	62,365	8,515	0	0	1,117,237	2,057	7,375	379,686	1,577,235
1973	33,931	4,615	0	0	751,373	2,307	3,017	77,630	872,873
1974	49,114	4,413	0	45,531	666,973	2,206	3,114	106,332	877,685
1975	63,140	4,671	0	33,862	838,135	2,491	3,920	134,295	1,080,514
1976	70,851	5,132	0	93,991	957,767	2,737	4,910	100,597	1,235,984
1977	26,565	1,758	0	83,339	493,847	3,644	2,602	43,067	654,822
1978	108,944	938	0	188,966	1,605,431	4,319	6,294	24,901	1,939,793
1979	107,956	4,871	0	193,260	2,356,542	5,602	13,172	434,472	3,115,874
1980	88,746	1,935	0	121,603	1,731,588	4,762	7,766	163,301	2,119,700
1981	129,687	18,533	0	259,802	2,401,614	7,275	8,904	263,922	3,089,736
1982	108,561	937	0	138,432	2,382,218	4,541	6,763	48,137	2,689,589
1983	61,443	0	0	13,954	929,183	5,862	3,232	1,218	1,014,692
1984	82,423	0	0	172,730	2,039,966	5,946	7,475	10,496	2,319,036
1985	114,571	12,938	0	228,121	2,581,708	8,422	8,815	271,970	3,226,546
1986	236,756	5,513	0	377,798	4,876,960	17,433	16,927	376,088	5,907,475
1987	187,090	10,273	0	491,023	4,244,094	16,140	15,529	375,604	5,339,754
1988	188,170	14,894	0	494,958	4,280,201	15,528	11,928	374,528	5,380,208
1989	285,261	15,450	0	656,118	6,183,768	20,063	21,693	649,604	7,831,958
1990	218,786	7,710	0	817,290	4,806,772	12,056	12,072	344,008	6,218,694
1991	4,393	1,047	0	185,013	47,869	0	521	10,331	249,174
1992	76,840	4,426	0	217,223	1,709,933	6,059	5,222	151,055	2,170,758
1993	20,064	4,843	0	48,161	371,012	2,090	1,467	123,913	571,550
1994	135,626	7,854	0	461,574	3,427,557	9,967	10,102	293,748	4,346,429
1995	181,772	4,611	0	401,880	3,445,511	11,619	10,492	288,010	4,343,895
1996	286,064	9,577	0	710,852	6,333,517	21,039	16,403	1,196,303	8,573,755
1997	308,515	0	0	557,650	5,720,501	0	15,559	94,838	6,697,062
1998	16,993	(54)	0	(16,341)	91,651	(2)	1,171	(2,095)	91,324
1999	191,682	10,198	0	463,890	3,954,090	12,844	11,542	937,238	5,581,485
2000	187,499	5,572	0	145,048	4,094,882	11,150	9,981	614,208	5,068,338
2001	795,346	25,814	0	157,947	11,972,552	29,611	46,224	1,130,552	14,158,047
2002	425,664	12,226	0	183,569	8,013,780	24,836	29,691	939,772	9,529,537
2003	453,879	14,144	0	493,783	9,972,811	36,364	28,706	1,042,468	12,042,155
2004	519,124	37,676	0	1,403,068	8,919,108	95,754	33,583	859,466	11,867,780
2005	971,096	45,499	0	831,145	17,526,571	235,043	33,805	1,661,442	21,304,601
2006	687,279	31,294	0	951,319	13,200,756	90,868	27,782	1,031,749	16,021,047
2007	609,877	28,160	0	759,743	11,915,777	78,120	32,392	1,176,690	14,600,759
2008	360,409	15,392	0	717,130	7,300,880	62,349	23,348	551,064	9,030,573
2009	208,096	10,141	0	72,371	5,607,350	33,256	12,688	360,945	6,304,848
2010	457,535	50,273	0	159,190	10,081,231	74,607	32,607	886,549	11,741,991
2011	969,434	30,589	0	734,328	20,553,701	107,218	30,506	883,886	23,309,662
2012	315,983	38,683	0	616,981	13,872,526	130,369	39,253	1,536,873	16,550,668
2013	875,078	45,669	0	1,933,502	17,301,100	103,709	53,351	1,037,488	21,349,898
2014	<b>703,691</b>	<b>41,934</b>	<b>0</b>	<b>2,191,655</b>	<b>15,337,612</b>	<b>132,976</b>	<b>55,657</b>	<b>1,242,932</b>	<b>19,706,457</b>
2015	688,583	43,633	0	2,278,302	15,934,592	138,333	58,041	1,293,318	20,434,802
2016	446,424	30,899	0	1,670,002	11,420,996	97,027	36,710	915,868	14,617,926
2017	521,179	36,073	0	1,875,261	12,772,395	113,075	47,357	1,069,232	16,434,573
2018	403,694	27,942	0	1,592,412	10,694,197	87,950	30,590	828,205	13,664,989
2019	551,769	38,191	0	2,004,516	13,427,777	119,739	51,281	1,131,990	17,325,262
2020	493,404	34,151	0	1,841,249	12,345,429	107,209	43,151	1,012,250	15,876,844
2021	531,705	36,802	0	1,953,178	13,084,322	115,431	48,290	1,090,827	16,860,555
2022	442,948	30,659	0	1,691,178	11,356,380	96,377	36,488	908,738	14,562,768
2023	541,312	37,467	0	1,988,674	13,313,979	117,494	49,280	1,110,537	17,158,743
2024	494,303	34,213	0	1,841,333	12,347,575	107,402	43,376	1,014,095	15,882,297
2025	454,131	31,433	0	1,726,685	11,588,995	98,778	37,875	931,679	14,869,574
2026	530,748	36,736	0	1,947,338	13,047,670	115,226	48,287	1,088,864	16,814,867
2027	380,433	26,332	0	1,507,702	10,145,645	82,956	28,133	780,482	12,951,683
2028	487,855	33,767	0	1,821,825	12,219,210	106,018	42,538	1,000,866	15,712,079
2029	628,535	43,504	0	2,247,041	15,017,419	136,219	60,842	1,289,480	19,423,041
2030	434,069	30,044	0	1,659,236	11,149,266	94,471	35,541	890,521	14,293,149
2031	527,027	36,478	0	1,965,212	13,147,407	114,427	46,640	1,081,231	16,918,423
2032	496,783	34,385	0	1,833,123	12,302,958	107,934	44,348	1,019,183	15,838,715
2033	561,274	38,848	0	2,066,792	13,817,057	121,779	51,173	1,151,490	17,808,413
2034	482,089	33,368	0	1,792,474	12,033,210	104,780	42,281	989,037	15,477,238
2035	672,233	46,528	0	2,440,447	16,251,303	145,600	64,175	1,379,129	20,999,415
<b>TOTAL</b>	<b>23,005,464</b>	<b>1,359,948</b>	<b>0</b>	<b>58,535,439</b>	<b>515,400,368</b>	<b>3,788,587</b>	<b>1,694,008</b>	<b>44,364,906</b>	<b>648,148,720</b>

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

**TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	30,401	0	0	0	0	0	0	0	0
1969	0	30,627	0	0	0	0	0	0	0	0
1970	0	39,430	0	0	0	0	0	0	0	0
1971	0	34,871	0	0	0	0	0	0	0	0
1972	710	47,571	0	6,602	0	4,156	783	0	15,117	0
1973	270	28,968	96,209	6,453	149,289	3,687	0	0	249,193	0
1974	15,040	28,982	96,540	9,458	150,844	4,770	211	0	161,738	5,961
1975	97,373	28,568	105,611	12,447	165,961	6,274	0	0	129,042	50,723
1976	379,830	38,365	132,461	17,464	209,148	8,052	0	0	132,365	65,476
1977	194,137	21,006	0	22,635	0	1,924	1,633	0	206,587	74,838
1978	572,290	45,550	170,805	20,478	259,155	2,686	0	0	35,203	67,462
1979	1,045,698	83,936	225,048	28,179	335,459	2,299	89,456	0	228	3,668
1980	1,390,117	51,143	256,759	29,229	401,038	3,667	94,362	0	0	16,504
1981	1,480,362	118,583	274,149	33,632	430,304	23,861	90,590	0	254,649	57,523
1982	923,973	132,575	292,674	27,190	461,216	0	230,608	0	126,461	189,895
1983	333,772	(335,712)	172,336	10,792	272,477	385	0	0	(71,602)	(8,768)
1984	485,847	(142,910)	273,597	19,572	433,785	15	0	0	(66,353)	(91,433)
1985	281,069	(335,343)	413,406	34,603	657,011	0	0	32,464	(47,544)	(32,348)
1986	1,109,047	54,812	728,808	60,274	1,160,650	5,548	0	105,375	69,170	101,843
1987	1,019,605	(40,745)	668,383	63,601	1,083,530	32,651	585	157,843	88,076	49,930
1988	1,019,793	(74,006)	688,891	66,914	1,134,141	11,991	300	50,654	92,465	38,688
1989	1,736,901	178,359	978,885	97,114	1,633,489	38,269	8,951	350,953	340,460	210,334
1990	2,442,558	422,502	1,402,619	110,934	2,313,410	90,472	0	446,408	599,573	530,099
1991	286,485	(3,054)	277,078	33,945	456,999	17,978	128,405	132,700	35,339	52,116
1992	587,340	(208,900)	240,119	11,952	396,022	4,871	241,338	78,306	(22,718)	(53,500)
1993	(190,611)	(491,161)	(809,033)	(2,389)	(1,334,429)	(3,246)	(61,112)	(29,466)	(157,452)	(519,798)
1994	1,841,902	66,338	189,616	34,480	312,714	41,201	731,185	315,446	122,829	204,783
1995	1,761,209	(247,735)	(251,547)	7,960	(414,889)	7,727	165,622	114,342	(7,579)	(140,714)
1996	1,883,530	72,171	508,274	18,313	838,330	16,510	289,044	385,745	49,537	133,848
1997	2,121,818	22,440	365,342	24,076	330,153	15,099	414,596	438,212	61,553	115,882
1998	(577,005)	(733,387)	(3,979,131)	(2,991)	(3,279,862)	(4,405)	(46,209)	(84,367)	(87,188)	(432,227)
1999	1,250,830	(475,206)	(683,915)	18,893	(787,153)	6,193	172,541	252,025	(174,420)	(244,303)
2000	1,649,757	(400,024)	(481,259)	22,583	(662,184)	0	268,269	178,839	(209,217)	(172,158)
2001	10,865,814	4,504,776	1,516,404	208,799	2,501,234	0	859,787	1,807,596	4,413,902	393,265
2002	3,940,463	1,972,885	737,668	162,408	1,216,898	0	332,517	1,250,856	3,146,931	1,094,108
2003	5,102,914	3,155,422	908,048	145,766	1,497,528	0	1,429,999	981,581	1,641,755	1,379,016
2004	5,204,461	3,238,845	1,014,120	192,203	1,389,538	0	1,340,546	1,058,862	3,796,147	822,378
2005	5,975,183	2,997,184	3,435,143	89,645	3,965,938	0	1,575,081	1,169,650	2,641,416	1,129,778
2006	6,404,646	2,245,537	7,042,283	56,378	2,907,631	0	3,164,572	995,308	2,174,900	946,957
2007	9,367,891	4,240,473	7,369,578	231,139	3,042,714	0	6,182,543	2,223,818	6,102,046	404,971
2008	5,830,103	3,802,969	4,861,557	115,078	2,637,676	3,036	3,551,973	1,731,112	4,102,326	756,838
2009	4,082,638	2,510,659	3,320,582	94,854	1,329,389	3,847	3,173,486	1,404,853	3,337,883	838,531
2010	6,223,266	2,820,163	7,567,484	42,342	2,804,165	0	4,688,580	1,167,108	4,854,796	1,724,782
2011	11,026,525	2,819,477	9,074,038	24,144	3,656,492	0	657,281	1,229,621	3,572,253	2,371,156
2012	11,002,168	5,247,434	13,392,744	71,613	5,068,556	0	1,762,813	2,553,372	11,888,273	2,592,996
2013	14,948,499	12,306,304	10,876,216	385,507	3,761,357	154,784	4,736,974	2,863,748	8,743,165	2,182,988
2014	<b>16,224,203</b>	<b>9,063,543</b>	<b>15,047,625</b>	<b>723,601</b>	<b>6,063,644</b>	<b>263,901</b>	<b>10,213,009</b>	<b>2,443,957</b>	<b>11,162,403</b>	<b>3,132,429</b>
2015	16,829,430	9,446,370	15,657,281	768,348	6,309,313	273,746	11,017,347	2,535,126	11,614,616	3,259,340
2016	14,457,136	7,935,794	13,066,220	653,685	5,265,210	235,159	9,910,864	2,177,772	9,692,918	2,719,965
2017	13,987,822	7,714,714	12,547,323	630,322	5,056,113	227,525	9,397,846	2,107,076	9,308,059	2,611,947
2018	14,771,482	6,499,060	13,301,645	666,159	5,360,077	240,272	10,847,977	2,225,124	9,872,573	2,768,973
2019	14,174,603	6,289,109	12,709,880	636,460	5,121,618	230,563	10,336,805	2,135,212	9,433,356	2,645,786
2020	14,378,623	6,367,278	12,844,608	646,660	5,175,908	233,881	10,587,111	2,165,945	9,533,610	2,673,832
2021	14,408,684	6,529,125	12,924,677	647,751	5,208,173	234,370	10,602,409	2,170,474	9,592,820	2,690,500
2022	14,238,744	6,489,860	12,805,310	640,925	5,160,072	231,606	10,498,349	2,144,874	9,504,161	2,665,652
2023	14,683,216	6,878,704	13,194,390	660,121	5,316,857	238,836	10,806,437	2,211,828	9,792,918	2,746,646
2024	14,301,120	6,745,762	12,790,434	641,984	5,154,078	232,621	10,497,919	2,154,271	9,493,255	2,662,555
2025	14,347,602	6,886,526	12,896,143	645,904	5,196,675	233,377	10,581,231	2,161,272	9,571,611	2,684,560
2026	14,305,903	6,983,555	12,792,724	642,671	5,155,001	232,699	10,514,061	2,154,991	9,494,997	2,663,032
2027	14,158,344	6,874,323	12,690,923	637,803	5,113,979	230,298	10,451,985	2,132,763	9,419,457	2,641,840
2028	14,257,599	7,081,120	12,753,665	641,237	5,139,261	231,913	10,497,983	2,147,715	9,466,074	2,654,901
2029	14,896,616	7,546,744	13,412,058	667,752	5,404,570	242,307	10,911,931	2,243,974	9,954,229	2,791,957
2030	14,015,186	7,104,438	12,527,708	631,019	5,048,209	227,970	10,336,704	2,111,198	9,298,422	2,607,864
2031	15,351,785	7,831,788	13,888,260	688,356	5,596,462	249,711	11,252,773	2,312,539	10,307,426	2,891,087
2032	13,738,895	7,233,884	12,264,459	617,615	4,942,129	232,476	10,106,042	2,069,579	9,103,021	2,553,064
2033	15,428,925	8,143,187	13,905,571	691,986	5,603,438	250,966	11,314,271	2,324,159	10,320,481	2,894,691
2034	13,800,688	7,475,915	12,354,464	621,036	4,978,398	224,481	10,168,888	2,078,887	9,169,741	2,571,800
2035	17,379,304	9,032,024	15,805,355	772,755	6,368,981	282,690	12,573,540	2,617,957	11,729,440	3,290,164
TOTAL	448,794,126	212,103,966	365,649,309	17,238,424	160,623,887	5,776,667	269,702,790	72,189,660	279,176,866	77,734,677

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

**TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	0	0	0	192,605
1967	0	0	0	0	0	0	0	0	0	236,998
1968	0	0	0	30,401	0	0	0	0	0	1,117,913
1969	0	0	0	30,627	0	0	0	0	0	773,646
1970	0	0	0	39,430	0	0	0	0	0	1,103,798
1971	0	0	0	34,871	0	0	0	0	0	1,476,135
1972	0	752,580	0	827,518	0	0	0	0	0	3,142,901
1973	0	942,905	0	1,476,973	0	0	0	0	0	2,946,091
1974	0	1,683,743	0	2,157,268	0	0	0	0	0	3,698,160
1975	0	3,687,903	0	4,283,902	0	0	0	0	0	5,831,562
1976	0	5,253,329	0	6,236,491	0	0	0	0	0	8,215,667
1977	0	(977,112)	0	(454,352)	0	0	0	0	0	926,518
1978	0	3,468,162	0	4,641,791	0	0	0	0	0	7,371,033
1979	0	3,795,878	0	5,609,848	0	0	0	0	0	9,608,834
1980	0	5,362,245	0	7,605,063	0	0	0	0	0	10,425,874
1981	0	10,862,932	0	13,626,585	0	0	0	0	0	17,576,025
1982	0	7,685,168	0	10,069,760	0	0	0	0	0	13,566,611
1983	0	(8,994,497)	0	(8,620,817)	0	0	0	0	0	(7,441,457)
1984	0	(7,633,741)	0	(6,721,621)	0	0	0	0	0	(4,008,600)
1985	0	(15,213,299)	0	(13,669,983)	0	0	0	0	0	(9,784,305)
1986	0	1,135,478	0	4,531,004	0	0	0	0	0	11,629,557
1987	0	(3,007,097)	0	116,362	0	0	0	0	0	6,746,469
1988	0	(3,407,929)	0	(378,098)	0	0	0	0	0	6,351,153
1989	0	9,488,536	0	15,062,251	0	0	0	0	0	24,661,303
1990	0	30,759,725	204,582	39,322,883	0	0	0	0	0	48,184,400
1991	0	184,870	22,623	1,625,484	0	0	0	0	0	2,463,685
1992	0	(9,471,028)	0	(8,196,199)	0	0	0	0	0	(5,499,060)
1993	0	(21,473,875)	0	(25,072,572)	0	0	0	0	0	(24,652,636)
1994	0	4,059,683	0	7,920,180	0	0	0	0	0	13,514,311
1995	0	(4,895,977)	0	(4,901,580)	0	0	0	0	0	(99,701)
1996	0	1,859,275	0	6,054,578	0	0	0	0	0	15,893,939
1997	0	2,428,729	(921)	6,336,978	0	0	0	0	0	14,932,640
1998	0	(14,593,773)	(68,568)	(23,889,113)	0	0	0	0	0	(24,030,879)
1999	0	(9,859,076)	(31,704)	(10,555,295)	0	0	0	0	0	(3,695,239)
2000	0	(16,720,534)	1,343	(16,524,585)	0	0	0	0	0	(9,529,054)
2001	0	160,090,738	269,117	187,431,433	0	0	0	0	0	210,554,082
2002	0	59,840,151	279,773	73,974,657	0	0	0	0	0	88,871,047
2003	7,293	94,397,023	358,241	111,004,588	0	0	0	0	0	129,538,621
2004	97,767	106,695,328	415,475	125,265,670	0	0	0	0	0	143,601,645
2005	83,957	113,376,456	122,591	136,562,022	0	0	0	0	0	165,562,019
2006	438,720	82,894,100	92,893	109,363,926	0	0	0	0	0	131,813,281
2007	613,362	137,960,557	317,644	178,056,737	0	0	0	0	0	201,891,261
2008	742,034	84,136,645	410,151	112,681,497	0	0	0	0	0	128,933,748
2009	729,462	59,087,386	346,368	80,259,937	0	0	0	0	0	91,991,369
2010	1,111,154	90,795,561	405,993	124,205,394	0	0	0	0	0	143,001,072
2011	1,547,969	131,220,280	423,709	167,622,945	0	0	0	0	0	200,850,519
2012	2,190,459	140,784,700	608,409	197,163,537	0	0	0	0	0	222,567,549
2013	2,890,956	185,355,572	663,190	249,869,260	0	0	0	0	0	286,383,219
2014	<b>2,898,831</b>	<b>193,446,189</b>	<b>2,121,511</b>	<b>272,804,847</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>307,328,720</b>
2015	3,053,141	201,473,380	2,209,404	284,446,843	0	0	0	0	0	320,717,803
2016	2,605,270	169,244,240	1,875,003	239,839,235	0	0	0	0	0	266,424,905
2017	2,540,384	163,544,818	1,816,678	231,490,627	0	0	0	0	0	260,400,057
2018	2,634,709	175,824,164	1,446,744	246,458,958	0	0	0	0	0	272,891,386
2019	2,560,711	168,997,019	1,393,648	236,664,769	0	0	0	0	0	267,791,396
2020	2,577,558	170,907,059	1,412,845	239,504,920	0	0	0	0	0	268,776,614
2021	2,587,570	171,927,119	1,419,008	240,942,679	0	0	0	0	0	271,457,208
2022	2,572,644	169,641,676	1,397,196	237,991,070	0	0	0	0	0	265,611,492
2023	2,621,297	175,329,745	1,445,500	245,926,444	0	0	0	0	0	276,792,471
2024	2,570,784	169,626,599	1,398,275	238,269,656	0	0	0	0	0	267,556,932
2025	2,584,003	170,989,704	1,409,181	240,187,790	0	0	0	0	0	268,186,222
2026	2,571,070	170,268,687	1,406,599	239,185,990	0	0	0	0	0	269,653,232
2027	2,558,341	167,978,516	1,384,959	236,273,531	0	0	0	0	0	261,861,197
2028	2,566,186	169,619,142	1,401,455	238,458,223	0	0	0	0	0	267,532,730
2029	2,648,515	178,038,578	1,463,983	250,223,215	0	0	0	0	0	283,938,141
2030	2,537,931	166,525,044	1,376,714	234,348,409	0	0	0	0	0	261,648,686
2031	2,708,062	182,620,970	1,492,382	257,191,599	0	0	0	0	0	287,692,417
2032	2,505,013	163,505,932	1,353,247	230,216,357	0	0	0	0	0	259,501,822
2033	2,710,227	183,603,781	1,505,520	258,697,202	0	0	0	0	0	290,317,261
2034	2,516,268	164,577,661	1,361,128	231,899,357	0	0	0	0	0	260,720,179
2035	2,947,785	203,818,052	1,636,293	288,254,342	0	0	0	0	0	323,742,436
TOTAL	68,529,435	5,275,305,775	38,568,134	7,291,393,716	0	0	0	0	0	8,370,261,056

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

**TABLE B-19 Total Transportation Charge for Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	21,132	76,669	0	0	0
1963	0	0	0	199,726	190,272	447,723	837,721	0	0	0
1964	0	0	0	263,282	277,455	621,356	1,162,093	6,696	21,667	28,363
1965	0	0	0	373,816	404,324	1,158,090	1,936,230	13,756	36,029	49,785
1966	18,063	0	18,063	419,467	421,723	1,412,953	2,254,143	26,524	61,349	87,873
1967	41,574	0	41,574	539,115	498,441	1,686,099	2,723,655	56,469	118,263	174,731
1968	128,628	0	128,628	663,819	603,483	1,985,221	3,252,523	115,961	229,807	345,768
1969	254,715	0	254,715	787,333	539,340	2,083,253	3,409,926	185,156	358,861	544,017
1970	277,547	0	277,547	823,093	532,567	2,202,766	3,558,427	200,150	387,675	587,825
1971	227,474	0	227,474	788,188	552,114	2,169,897	3,510,199	202,413	392,912	595,325
1972	224,978	0	224,978	829,915	678,519	2,320,420	3,828,854	209,057	406,589	615,646
1973	221,091	31,366	252,457	795,178	549,393	2,338,620	3,683,191	206,557	402,724	609,281
1974	240,498	32,938	273,437	818,994	564,593	2,506,359	3,889,946	208,545	407,090	615,635
1975	237,459	36,291	273,750	868,915	605,731	2,409,923	3,884,569	225,895	439,873	665,768
1976	271,292	40,836	312,127	959,712	734,812	2,500,505	4,195,029	228,976	447,299	676,275
1977	293,627	45,096	338,723	923,923	713,558	2,476,399	4,113,880	238,699	468,721	707,420
1978	273,870	49,178	323,048	979,313	692,587	2,785,987	4,457,887	245,331	484,259	729,590
1979	289,479	53,340	342,819	1,044,531	736,358	2,813,578	4,594,468	243,110	483,437	726,547
1980	310,846	67,748	378,594	1,162,598	866,372	3,028,205	5,057,175	269,858	537,074	806,932
1981	347,781	87,408	435,189	1,128,327	879,357	2,917,582	4,925,266	288,997	586,257	875,254
1982	438,335	106,918	545,254	1,166,269	850,482	3,262,104	5,278,855	290,049	582,757	872,806
1983	354,787	151,259	506,046	1,177,884	900,363	3,795,446	5,873,692	319,214	633,181	952,395
1984	467,336	224,245	691,581	1,470,064	1,097,481	5,737,801	8,305,346	351,620	695,559	1,047,179
1985	736,074	364,305	1,100,379	1,920,561	1,789,369	6,551,546	10,261,476	394,593	776,994	1,171,586
1986	1,084,728	692,479	1,777,207	1,747,817	1,528,732	6,863,230	10,139,778	385,545	762,684	1,148,229
1987	1,773,801	1,559,243	3,333,044	2,237,732	2,011,876	6,675,354	10,924,962	385,289	812,310	1,197,599
1988	2,231,563	2,333,792	4,565,355	2,239,416	2,210,523	6,368,850	10,818,789	420,153	978,621	1,398,774
1989	2,397,272	3,326,435	5,723,708	2,155,760	1,872,030	5,916,713	9,944,504	414,224	1,162,723	1,576,947
1990	2,746,135	3,433,320	6,179,455	2,575,098	2,261,914	6,668,440	11,505,452	487,609	1,234,409	1,722,018
1991	2,748,636	3,682,311	6,430,947	1,754,727	1,621,189	4,527,927	7,903,843	491,419	1,476,387	1,967,806
1992	2,554,529	3,528,957	6,083,486	2,075,907	2,003,328	5,385,858	9,465,093	551,042	1,491,156	2,042,198
1993	2,592,888	3,504,240	6,097,128	2,881,149	2,011,222	6,511,865	11,404,236	610,115	1,675,438	2,285,553
1994	2,718,328	3,537,460	6,255,788	2,907,900	2,642,460	7,314,515	12,864,875	767,900	2,473,449	3,241,348
1995	2,649,273	3,509,935	6,159,208	3,036,261	2,289,027	5,893,667	11,218,955	995,341	4,977,122	5,972,462
1996	2,699,210	3,891,715	6,590,926	2,585,404	2,137,443	6,675,492	11,398,338	1,837,383	13,766,531	15,603,915
1997	2,641,891	3,631,175	6,273,066	2,658,659	2,007,333	6,551,469	11,217,461	2,294,918	12,860,553	24,155,471
1998	2,538,764	3,478,062	6,016,827	2,265,056	2,064,166	6,296,050	10,625,272	2,976,896	26,690,793	29,667,689
1999	2,690,995	3,843,919	6,534,914	2,890,865	2,454,592	8,386,088	13,731,545	3,032,982	27,474,863	30,507,845
2000	2,836,779	4,323,647	7,160,425	3,919,291	2,303,715	7,025,915	13,248,921	2,962,096	27,897,849	30,859,944
2001	3,367,997	4,981,668	8,349,665	7,407,310	2,806,174	8,477,649	18,691,134	3,517,467	30,067,075	33,584,542
2002	3,561,105	5,085,771	8,646,877	10,847,259	2,778,183	9,921,992	23,547,434	3,228,052	29,679,832	32,907,884
2003	3,679,060	5,431,375	9,110,435	7,533,973	2,521,861	8,769,852	18,825,686	3,318,668	29,979,048	33,297,716
2004	4,160,818	5,685,520	9,846,338	5,738,523	2,828,065	8,244,217	16,810,805	3,335,628	30,424,384	33,760,012
2005	3,514,353	5,182,811	8,697,165	5,725,331	2,966,673	8,977,184	17,669,187	3,458,119	30,511,291	33,969,411
2006	3,437,838	4,685,090	8,122,928	5,648,232	2,935,561	9,040,220	17,624,013	3,292,127	30,122,616	33,414,743
2007	3,686,174	5,300,698	9,086,871	6,718,719	3,466,603	10,338,439	20,523,761	3,450,666	31,390,965	34,841,631
2008	4,356,738	5,153,556	9,510,295	7,520,869	3,734,241	10,443,905	21,699,015	3,939,495	32,590,762	36,530,257
2009	4,802,938	5,209,573	10,012,511	6,526,158	3,309,316	10,327,921	20,163,395	3,775,261	31,056,730	34,831,991
2010	5,062,573	6,615,783	11,678,357	7,403,552	3,657,738	11,181,488	22,242,777	4,163,412	33,413,882	37,577,294
2011	5,447,935	6,972,502	12,420,437	8,638,902	4,309,183	12,944,359	25,892,444	4,243,806	34,518,751	38,762,557
2012	5,850,830	6,860,034	12,710,865	9,621,490	4,343,105	15,263,181	29,227,775	4,263,106	34,927,272	39,190,378
2013	6,088,721	7,294,274	13,382,995	10,417,992	5,025,735	15,550,082	30,993,808	4,852,319	36,526,222	41,378,540
<b>2014</b>	<b>6,128,583</b>	<b>7,398,087</b>	<b>13,526,670</b>	<b>10,000,308</b>	<b>5,056,466</b>	<b>14,294,738</b>	<b>29,351,512</b>	<b>4,781,082</b>	<b>36,707,415</b>	<b>41,488,497</b>
2015	6,024,227	7,435,836	13,460,063	10,190,530	4,941,478	13,643,911	28,775,918	4,487,382	35,977,113	40,464,495
2016	5,827,478	7,193,390	13,020,868	9,203,816	4,429,896	12,296,638	25,930,350	4,489,560	35,722,155	40,211,715
2017	5,791,281	7,186,617	12,977,898	9,238,118	4,454,835	12,322,721	26,015,674	4,466,313	35,775,621	40,241,934
2018	5,707,496	7,216,258	12,923,754	8,872,011	4,333,453	11,900,097	25,105,561	5,436,636	35,589,209	41,025,845
2019	5,674,130	7,253,665	12,927,795	9,095,002	4,467,834	12,211,250	25,774,086	5,505,644	35,786,040	41,291,684
2020	5,686,992	7,291,996	12,978,989	8,983,070	4,411,916	12,083,347	25,478,334	5,492,190	35,796,581	41,288,771
2021	5,704,845	7,333,341	13,038,186	9,100,262	4,472,262	12,236,261	25,808,785	5,534,119	35,929,236	41,463,355
2022	5,719,564	7,371,360	13,090,924	8,966,447	4,400,983	12,073,280	25,440,710	5,505,834	35,906,709	41,412,543
2023	5,732,563	7,374,230	13,106,792	9,171,325	4,506,436	12,331,557	26,009,318	5,561,331	36,069,895	41,631,226
2024	5,744,487	7,410,159	13,154,646	9,116,155	4,476,248	12,268,129	25,860,532	5,549,920	36,086,026	41,635,946
2025	5,747,248	7,441,937	13,189,185	9,053,451	4,442,161	12,195,274	25,690,886	5,534,172	36,092,968	41,627,141
2026	5,759,738	7,477,520	13,237,258	9,238,805	4,537,280	12,430,717	26,206,802	5,588,182	36,253,040	41,841,222
2027	5,774,728	7,514,130	13,288,858	8,992,169	4,407,157	12,128,773	25,528,098	5,534,337	36,174,242	41,708,579
2028	5,788,363	7,550,309	13,338,672	9,228,889	4,528,836	12,426,507	26,184,231	5,596,515	36,353,343	41,949,858
2029	5,802,436	7,587,271	13,389,707	9,521,454	4,679,566	12,793,923	26,994,943	5,680,544	36,579,507	42,260,052
2030	5,808,688	7,612,787	13,421,475	9,195,852	4,508,469	12,395,654	26,099,975	5,602,972	36,448,711	42,051,683
2031	5,811,751	7,633,886	13,445,637	9,381,844	4,603,534	12,631,193	26,616,572	5,660,507	36,608,220	42,268,728
2032	5,817,129	7,655,538	13,472,667	9,392,886	4,608,001	12,651,276	26,652,163	5,665,684	36,669,815	42,335,498
2033	5,803,918	7,651,099	13,455,017	9,529,467	4,677,869	12,827,079	27,034,415	5,715,093	36,827,731	42,542,824
2034	5,749,857	7,617,923	13,367,781	9,432,988	4,625,854	12,711,825	26,770,666	5,694,902	36,827,119	42,522,021
2035	5,620,952	7,515,507	13,136,459	9,770,970	4,800,427	13,136,666	27,708,063	5,802,905	37,110,230	42,913,134
<b>TOTAL</b>	<b>226,803,782</b>	<b>287,749,122</b>	<b>514,552,904</b>	<b>362,470,938</b>	<b>192,195,427</b>	<b>571,765,704</b>	<b>1,126,432,069</b>	<b>190,864,487</b>	<b>1,356,193,018</b>	<b>1,547,057,505</b>



**TABLE B-19 Total Transportation Charge for Each Contractor**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agri- cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	2,725
1965	0	0	6,029	73,569	0	0	0	0	79,598
1966	0	0	12,039	137,330	0	0	0	0	149,368
1967	0	0	26,257	267,611	0	0	0	0	293,869
1968	184,900	8,923	54,588	445,439	1,545,572	13,770	11,621	209,130	2,473,942
1969	180,508	7,689	87,576	525,094	2,394,539	12,625	10,628	357,913	3,576,572
1970	202,553	14,455	94,675	573,998	2,917,868	12,790	13,166	294,358	4,123,863
1971	198,877	15,413	95,695	605,889	3,790,098	17,764	14,469	449,522	5,187,726
1972	221,486	16,281	98,788	631,615	4,965,516	15,220	20,800	1,083,816	7,053,522
1973	204,117	12,352	97,550	639,250	4,915,318	15,483	11,780	410,101	6,305,952
1974	284,334	12,321	98,460	697,026	5,227,038	15,591	12,870	599,576	6,947,215
1975	351,644	13,265	106,703	714,888	6,351,547	16,620	14,556	730,692	8,299,916
1976	306,268	13,811	108,084	773,628	6,707,605	16,993	16,237	566,282	8,508,910
1977	268,227	10,922	112,554	796,324	6,888,210	18,457	14,014	513,096	8,621,803
1978	357,171	4,441	115,521	889,236	8,336,730	18,921	18,057	506,882	10,246,959
1979	387,391	13,658	114,253	895,406	9,460,989	20,201	24,991	955,967	11,872,855
1980	408,616	12,009	125,950	888,893	10,035,432	20,749	24,409	740,351	12,256,408
1981	472,107	29,850	134,169	1,076,040	11,486,422	24,939	23,043	911,830	14,158,401
1982	466,616	12,999	135,057	997,853	12,324,855	22,955	22,513	749,364	14,732,212
1983	639,887	14,594	149,202	1,027,258	15,528,811	39,972	29,248	428,463	17,847,435
1984	912,538	15,008	164,505	2,019,472	23,704,876	54,428	59,763	786,594	27,717,185
1985	1,101,058	87,569	184,905	2,336,070	27,985,063	69,484	70,296	2,172,561	34,007,004
1986	1,265,269	34,025	180,445	2,365,158	30,541,058	80,769	76,161	2,186,432	36,729,317
1987	1,123,817	50,820	179,872	2,791,630	29,353,135	78,019	74,409	2,245,571	35,897,273
1988	1,109,398	61,615	193,735	2,720,416	29,285,114	74,169	60,290	2,203,341	35,708,078
1989	1,144,890	49,298	187,913	2,410,515	29,343,896	67,048	68,759	2,446,854	35,719,173
1990	866,818	34,458	221,392	2,512,729	27,464,693	51,057	49,190	1,873,997	33,074,334
1991	584,959	23,364	220,282	2,055,249	17,635,498	27,930	26,959	1,234,562	21,808,804
1992	954,559	39,200	241,455	2,359,679	25,943,728	55,795	51,013	1,911,702	31,557,132
1993	1,166,849	53,727	264,959	2,769,058	31,478,213	72,888	69,696	2,645,290	38,520,680
1994	1,021,939	43,853	306,359	2,799,087	29,333,341	60,460	57,463	2,121,220	35,743,721
1995	1,518,627	46,712	304,297	3,491,835	36,454,930	86,875	80,286	2,775,330	44,760,891
1996	1,348,153	48,344	389,203	3,555,587	36,435,157	86,092	73,934	4,321,220	46,257,690
1997	1,389,682	25,500	276,681	3,014,997	32,694,171	36,715	68,794	1,675,298	39,181,837
1998	1,233,566	34,455	381,847	2,654,434	29,357,616	41,835	60,090	1,805,542	35,569,384
1999	1,229,682	55,995	370,780	3,066,836	31,521,556	75,573	65,462	4,172,342	40,558,227
2000	1,059,562	37,952	304,418	2,317,103	26,366,244	61,525	54,509	2,767,242	32,968,555
2001	1,750,612	63,215	328,170	2,237,708	34,097,293	80,375	101,633	3,072,329	41,731,335
2002	1,318,667	43,679	320,887	2,330,380	28,959,691	73,347	77,904	2,551,301	35,675,857
2003	1,393,574	48,905	342,637	2,753,392	31,928,943	89,961	79,455	2,882,334	39,519,202
2004	1,449,924	78,214	345,113	3,761,874	30,544,719	234,347	82,003	2,394,693	38,890,887
2005	2,027,167	87,582	355,917	2,966,416	41,374,450	416,162	81,095	3,423,918	50,732,709
2006	1,757,525	73,713	296,012	3,239,002	37,026,888	248,035	77,867	2,748,413	45,467,455
2007	1,643,618	69,159	332,854	3,045,564	35,226,257	232,080	81,956	2,924,299	43,555,787
2008	1,496,363	61,495	468,523	3,416,166	34,403,084	244,222	79,966	2,401,823	42,571,641
2009	1,220,823	50,629	432,309	2,181,008	30,792,914	193,265	63,187	2,037,982	36,972,117
2010	1,494,811	112,475	506,601	2,371,376	36,949,164	258,216	89,850	2,736,183	44,518,677
2011	2,198,005	81,994	500,482	3,430,274	51,407,930	303,814	93,224	2,725,515	60,741,238
2012	1,287,142	92,797	464,435	3,291,757	42,773,733	333,096	97,890	3,631,873	51,972,721
2013	2,003,630	98,858	532,301	4,889,390	45,979,847	291,371	110,900	2,910,175	56,816,473
2014	<b>1,816,784</b>	<b>92,005</b>	<b>665,457</b>	<b>5,062,136</b>	<b>45,049,836</b>	<b>321,833</b>	<b>113,234</b>	<b>3,084,870</b>	<b>56,206,156</b>
2015	1,602,602	86,781	538,643	4,820,970	41,740,901	306,962	104,121	2,870,605	52,071,585
2016	1,373,799	75,016	583,804	4,178,256	37,867,405	269,787	84,520	2,520,280	46,952,867
2017	1,454,670	80,548	574,416	4,156,450	39,391,008	286,981	95,487	2,684,132	48,723,691
2018	1,334,445	72,160	556,468	3,739,683	37,260,578	251,638	78,244	2,435,404	45,728,619
2019	1,489,036	82,792	552,793	4,108,386	40,176,866	283,891	99,285	2,750,457	49,543,508
2020	1,362,332	79,176	555,828	3,930,322	39,288,200	272,417	91,558	2,643,178	48,223,011
2021	1,409,769	82,428	559,612	4,048,306	40,290,279	282,377	97,327	2,739,457	49,509,555
2022	1,326,690	76,646	563,934	3,791,290	38,737,937	264,385	85,842	2,567,960	47,414,683
2023	1,428,890	83,687	568,496	4,092,548	40,824,725	286,199	98,785	2,776,566	50,159,895
2024	1,386,514	80,721	573,014	3,954,127	40,008,067	276,986	93,100	2,688,555	49,061,085
2025	1,348,566	78,062	577,539	3,839,072	39,338,361	268,705	87,601	2,609,617	48,147,522
2026	1,431,826	83,791	582,410	4,076,074	40,998,460	286,464	98,410	2,779,333	50,336,768
2027	1,288,509	73,838	586,957	3,653,101	38,307,203	255,561	78,682	2,484,202	46,728,052
2028	1,402,033	81,662	589,765	3,981,436	40,569,115	279,748	93,431	2,715,987	49,713,176
2029	1,549,339	91,823	594,744	4,421,700	43,569,324	311,228	112,124	3,017,066	53,667,349
2030	1,360,840	78,741	599,803	3,846,442	39,886,729	270,608	87,151	2,629,205	48,759,518
2031	1,460,562	85,609	603,616	4,152,609	42,091,043	291,529	98,647	2,832,640	51,616,253
2032	1,437,158	83,953	609,061	4,041,607	41,455,054	286,438	96,757	2,783,462	50,793,489
2033	1,508,547	88,859	614,234	4,289,256	43,179,427	301,550	103,986	2,928,746	53,014,605
2034	1,436,329	83,824	619,180	4,027,685	41,607,944	285,815	95,503	2,779,400	50,935,680
2035	1,633,519	97,436	624,072	4,685,919	46,040,755	327,830	117,811	3,182,748	56,710,089
<b>TOTAL</b>	<b>77,050,685</b>	<b>3,737,154</b>	<b>24,269,009</b>	<b>188,707,884</b>	<b>1,986,918,967</b>	<b>10,652,934</b>	<b>4,578,010</b>	<b>145,797,149</b>	<b>2,441,711,791</b>

**TABLE B-19 Total Transportation Charge for Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline - Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	34,411	0	0	0	726	0	0	0	51,729	0
1964	64,494	27,447	19,542	4,370	38,211	1,143	29,757	8,205	82,811	34,987
1965	121,484	53,007	34,348	7,194	42,701	2,082	52,705	15,222	135,069	35,344
1966	221,012	101,264	62,476	12,478	76,886	3,753	94,978	27,679	232,502	61,465
1967	427,622	210,814	121,269	23,472	148,839	7,284	184,247	54,023	433,350	115,574
1968	754,401	478,336	218,649	41,509	265,168	12,870	328,476	95,466	782,163	208,927
1969	1,090,136	724,693	334,105	61,226	394,024	18,693	487,728	138,063	1,205,834	321,755
1970	1,420,639	904,654	470,423	89,700	552,223	25,231	673,925	184,837	1,778,187	467,573
1971	1,760,670	1,088,595	627,331	128,360	754,065	31,837	908,601	231,280	2,538,219	659,414
1972	2,084,628	1,307,609	777,838	175,023	971,501	42,063	1,168,486	274,599	3,371,743	865,095
1973	2,177,308	1,323,723	913,614	183,270	1,174,449	43,313	1,234,693	287,315	3,919,292	946,686
1974	2,241,262	1,383,201	934,446	192,851	1,205,307	45,049	1,267,766	292,071	3,983,075	990,064
1975	2,418,045	1,451,312	980,938	205,729	1,276,653	48,373	1,336,273	304,281	4,152,070	1,088,342
1976	2,768,602	1,446,700	1,029,259	214,713	1,352,442	51,351	1,379,597	313,685	4,292,603	1,141,598
1977	2,712,256	1,515,824	929,532	225,070	1,494,916	47,299	1,452,049	329,365	4,520,755	1,197,216
1978	3,025,953	1,600,683	1,108,296	230,643	1,465,635	47,073	1,452,836	321,681	4,458,326	1,208,720
1979	3,576,175	1,635,336	1,177,452	237,530	1,564,123	48,367	1,579,778	332,472	4,422,373	1,152,375
1980	4,136,480	1,717,062	1,271,861	259,401	1,730,656	53,348	1,701,296	360,461	4,835,652	1,269,446
1981	4,469,204	1,970,760	1,355,504	271,181	1,850,802	77,806	1,825,342	391,869	5,224,182	1,357,680
1982	4,031,426	2,062,473	1,403,332	280,313	1,936,175	55,961	2,020,996	406,891	5,410,876	1,565,182
1983	5,224,176	2,324,761	1,997,502	333,081	2,880,959	69,381	2,096,538	494,688	6,020,929	1,556,652
1984	7,262,706	3,366,493	3,084,372	445,339	4,608,466	75,773	2,325,679	553,321	7,049,449	2,331,849
1985	8,979,937	3,750,938	3,882,495	540,388	5,883,195	79,232	2,436,970	590,548	7,740,359	2,378,394
1986	8,880,068	4,318,568	4,308,841	577,473	6,571,197	102,399	2,546,788	1,000,062	7,857,569	3,047,740
1987	8,897,753	4,159,253	4,164,707	604,982	6,418,840	121,808	2,579,763	1,026,938	9,224,608	3,034,142
1988	8,373,323	4,222,595	4,163,832	616,000	6,482,143	124,667	2,634,713	779,820	9,505,260	2,828,998
1989	8,750,651	4,102,522	3,808,646	586,595	5,952,263	170,571	2,582,434	1,442,627	8,944,265	2,930,396
1990	10,040,074	4,542,969	4,487,885	620,394	7,014,185	289,349	2,779,936	1,639,830	9,795,020	3,678,107
1991	6,542,000	3,511,900	2,996,131	567,450	4,550,559	175,137	3,539,632	1,294,608	8,921,839	3,035,639
1992	8,644,005	4,469,466	3,068,616	470,165	4,667,983	121,335	4,341,430	1,129,578	8,573,361	2,980,091
1993	9,028,570	4,100,881	3,267,678	472,817	4,993,632	157,747	4,220,784	1,347,511	9,505,683	3,320,012
1994	11,216,190	4,713,093	3,313,737	554,651	5,066,159	225,809	5,214,423	1,698,991	10,209,084	4,076,706
1995	10,817,875	4,970,932	4,087,603	509,163	6,340,703	155,561	4,302,491	1,527,248	9,443,228	3,715,377
1996	11,187,158	5,159,012	7,025,781	553,232	11,183,947	150,613	4,369,862	1,867,203	9,869,330	3,807,422
1997	11,437,950	4,925,733	6,588,592	579,280	7,422,989	144,833	4,673,874	1,869,307	11,268,380	4,037,862
1998	9,956,830	4,554,200	5,663,864	546,645	5,928,447	146,074	5,710,042	1,474,029	11,192,751	3,321,115
1999	11,485,049	4,984,488	4,651,370	638,311	6,008,649	147,124	5,957,752	1,855,150	12,357,703	4,182,168
2000	10,494,562	6,790,756	3,009,523	594,161	4,294,246	115,316	5,718,830	1,437,147	11,893,154	3,239,506
2001	20,724,116	12,505,476	4,120,643	799,894	6,382,868	127,777	6,426,016	3,359,641	17,910,165	3,401,011
2002	11,994,141	9,670,426	3,359,604	759,543	5,127,291	109,736	5,546,926	2,738,042	18,771,807	4,785,221
2003	13,419,615	10,774,586	3,496,314	734,027	5,351,054	116,210	7,248,420	2,284,572	17,270,634	4,977,340
2004	14,274,937	11,831,250	4,126,686	833,461	5,387,002	125,095	7,359,985	2,522,318	21,595,330	4,414,186
2005	14,628,794	10,832,086	17,807,694	654,813	10,273,586	114,435	7,123,367	2,563,847	19,568,131	4,654,165
2006	16,133,143	9,974,206	27,381,274	636,363	9,907,833	122,794	9,846,742	2,494,008	19,329,777	4,685,771
2007	19,640,631	13,393,297	26,204,129	883,571	9,389,306	126,871	13,656,208	4,033,111	25,561,212	3,847,502
2008	17,158,325	15,328,905	25,787,326	810,170	10,322,760	135,920	11,999,702	3,953,628	25,689,104	4,813,559
2009	14,827,764	12,917,292	23,240,166	780,967	8,109,332	133,635	11,573,194	3,668,345	25,333,947	5,245,781
2010	17,583,956	12,759,667	31,878,851	695,285	11,006,793	123,028	13,970,459	3,028,469	27,890,686	6,798,540
2011	23,778,293	12,328,922	33,148,304	710,732	11,887,071	136,135	7,508,836	2,975,387	24,978,392	7,441,750
2012	24,653,298	16,131,612	41,515,669	832,398	14,826,701	148,177	9,475,963	5,068,907	39,997,187	8,106,257
2013	26,972,239	23,821,901	33,283,618	1,212,612	11,610,776	338,165	13,086,188	4,849,923	33,212,870	6,879,036
<b>2014</b>	<b>26,565,136</b>	<b>18,555,934</b>	<b>36,643,509</b>	<b>1,510,771</b>	<b>13,780,356</b>	<b>428,237</b>	<b>18,507,362</b>	<b>4,006,546</b>	<b>34,502,308</b>	<b>7,637,737</b>
2015	25,874,618	17,763,140	36,078,010	1,488,018	12,911,576	425,553	18,496,313	3,872,835	33,504,384	7,234,199
2016	23,374,938	16,404,368	35,198,635	1,388,391	12,182,600	386,071	17,598,137	3,509,268	31,961,581	6,796,819
2017	22,610,119	16,012,861	35,355,753	1,352,653	12,023,495	375,730	16,931,942	3,397,188	31,379,748	6,657,688
2018	22,921,430	14,363,226	35,759,280	1,364,990	12,137,518	380,612	18,116,660	3,446,249	31,527,393	6,696,810
2019	22,065,732	13,907,983	34,824,048	1,321,057	11,770,740	366,401	17,463,028	3,318,579	30,790,388	6,490,822
2020	22,027,938	13,813,797	34,536,160	1,308,881	11,663,387	364,694	17,735,154	3,308,486	30,455,289	6,406,159
2021	21,933,184	13,830,253	34,159,954	1,283,407	11,525,976	362,171	17,616,084	3,291,312	29,997,881	6,293,649
2022	21,667,681	13,680,114	33,231,912	1,263,293	11,306,219	357,705	17,418,415	3,251,298	29,594,533	6,190,220
2023	22,048,690	14,079,365	32,954,035	1,279,135	11,351,788	363,836	17,683,281	3,308,455	29,799,899	6,245,307
2024	21,657,981	13,917,093	32,496,061	1,259,222	11,181,170	357,531	17,376,855	3,249,613	29,483,600	6,155,683
2025	21,619,414	14,027,976	32,467,535	1,258,360	11,175,395	356,951	17,394,022	3,243,886	29,492,413	6,154,063
2026	21,629,809	14,166,410	32,388,166	1,257,586	11,151,232	357,158	17,364,643	3,245,488	29,459,732	6,140,427
2027	21,544,370	14,103,915	32,348,867	1,256,425	11,140,205	355,825	17,353,492	3,232,705	29,465,605	6,137,167
2028	21,680,725	14,332,377	32,482,321	1,262,849	11,191,799	358,091	17,435,749	3,253,303	29,589,837	6,166,855
2029	22,365,387	14,817,603	33,232,899	1,293,232	11,491,655	369,288	17,896,939	3,356,605	30,176,511	6,326,239
2030	21,506,270	14,343,790	32,423,401	1,259,418	11,161,016	355,385	17,353,272	3,227,497	29,603,658	6,159,864
2031	22,806,903	14,987,090	33,772,507	1,316,098	11,702,949	376,567	18,266,228	3,424,135	30,631,596	6,443,788
2032	21,266,478	14,397,423	32,290,245	1,250,978	11,100,958	351,571	17,190,389	3,192,400	29,558,836	6,136,947
2033	22,937,933	15,294,321	33,979,489	1,326,537	11,774,847	378,838	18,421,236	3,445,957	30,829,201	6,487,977
2034	21,265,009	14,645,550	32,446,770	1,254,953	11,151,107	351,711	17,288,394	3,196,432	29,696,704	6,164,929
2035	24,828,988	16,241,451	35,946,295	1,407,661	12,555,286	409,671	19,720,785	3,735,479	32,305,662	6,891,553
<b>TOTAL</b>	<b>938,743,132</b>	<b>599,927,714</b>	<b>1,107,707,517</b>	<b>51,961,910</b>	<b>501,277,292</b>	<b>13,373,199</b>	<b>602,661,859</b>	<b>145,619,950</b>	<b>1,216,118,785</b>	<b>284,254,637</b>

**TABLE B-19 Total Transportation Charge for Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	79,888
1963	0	690,812	0	777,678	0	0	0	0	12,626	1,628,026
1964	21,735	1,260,513	9,378	1,602,594	0	0	0	0	13,938	2,809,712
1965	21,866	2,180,589	17,766	2,719,376	0	0	405	405	28,937	4,814,330
1966	37,964	3,900,172	33,426	4,866,058	0	0	565	565	31,321	7,407,392
1967	71,283	7,693,703	68,155	9,559,635	0	0	562	562	47,718	12,841,744
1968	128,915	15,317,881	142,803	18,775,565	0	0	564	564	56,945	25,023,935
1969	198,764	23,153,064	215,209	28,343,295	0	0	3,191	3,191	52,963	36,184,678
1970	289,633	30,617,164	273,605	37,747,793	0	0	15,121	15,121	69,744	46,380,320
1971	409,327	39,958,997	342,425	49,439,122	0	0	16,001	16,001	55,532	59,031,378
1972	537,186	52,853,168	422,304	64,851,244	0	0	17,372	17,372	80,412	76,672,029
1973	587,963	57,132,802	435,655	70,360,083	0	0	17,334	17,334	54,219	81,282,516
1974	611,428	61,587,913	455,565	75,189,997	0	0	17,477	17,477	76,783	87,010,490
1975	644,621	66,557,535	478,403	80,942,573	0	0	18,406	18,406	84,547	94,169,528
1976	668,315	68,253,113	475,587	83,387,565	0	0	17,477	17,477	106,717	97,204,101
1977	696,515	66,053,753	507,063	81,381,613	0	0	18,232	18,232	98,618	95,280,288
1978	709,040	72,706,513	523,177	88,858,575	0	0	17,381	17,381	100,786	104,734,226
1979	712,866	72,440,511	526,405	89,405,764	0	0	20,579	20,579	119,352	107,082,383
1980	777,981	79,926,555	571,232	98,611,433	0	0	17,761	17,761	178,812	117,307,115
1981	806,031	91,261,394	636,404	111,498,158	0	0	21,193	21,193	185,347	132,098,807
1982	853,400	93,144,740	670,375	113,842,141	0	0	28,423	28,423	173,894	135,473,585
1983	952,131	101,787,700	803,591	126,542,089	0	0	19,276	19,276	220,926	151,971,860
1984	1,072,639	137,507,077	868,967	170,551,709	0	0	21,114	21,114	225,959	208,560,073
1985	1,120,854	173,442,297	908,769	211,902,879	0	0	20,239	20,239	340,322	258,803,885
1986	1,149,714	193,242,026	937,311	234,539,758	0	0	20,139	20,139	279,227	284,633,655
1987	1,172,015	178,764,439	908,034	221,166,744	0	0	19,742	19,742	345,116	272,884,479
1988	1,208,206	190,243,523	904,868	232,087,946	0	0	17,900	17,900	365,207	284,962,049
1989	1,194,911	193,235,260	932,599	234,633,739	0	0	19,158	19,158	422,329	288,039,557
1990	1,297,621	239,540,417	1,486,755	287,212,541	0	0	18,148	18,148	474,284	340,186,232
1991	1,354,921	179,950,983	1,141,118	217,581,916	0	0	21,018	21,018	214,683	255,929,016
1992	1,349,184	196,166,977	1,025,285	237,007,477	0	0	18,014	18,014	443,676	286,617,075
1993	1,507,550	169,493,328	1,068,135	212,484,329	0	0	20,999	20,999	599,571	271,412,497
1994	1,497,753	209,282,955	1,008,952	258,078,504	0	0	19,649	19,649	609,966	316,813,851
1995	1,520,622	173,420,265	1,061,324	221,872,390	0	0	20,277	20,277	534,971	290,539,154
1996	1,527,165	181,404,029	1,103,254	239,208,010	0	0	25,378	25,378	571,857	319,656,113
1997	1,730,348	186,736,526	1,216,560	242,632,233	0	0	24,820	24,820	428,638	323,913,525
1998	1,920,021	168,571,967	1,237,386	220,223,371	0	0	0	0	465,095	302,567,638
1999	2,170,291	191,904,157	1,266,445	247,608,655	0	0	(0)	(0)	587,326	339,528,513
2000	2,405,632	183,439,407	1,317,290	234,749,530	0	0	0	0	0	318,987,375
2001	3,321,717	376,190,620	1,619,721	456,889,667	0	0	(0)	(0)	0	559,246,343
2002	4,667,920	264,705,556	1,649,062	333,885,274	0	0	(0)	(0)	0	434,663,325
2003	5,941,697	294,286,034	1,678,395	367,578,897	0	0	20,768	20,768	0	468,352,703
2004	6,265,741	341,028,399	1,919,455	421,683,845	0	0	20,830	20,830	0	521,012,717
2005	6,526,023	312,616,507	1,399,822	408,763,269	0	0	20,827	20,827	0	519,852,568
2006	7,013,311	289,588,947	1,334,258	398,448,426	0	0	21,242	21,242	0	503,098,807
2007	7,655,798	374,950,790	1,877,915	501,220,340	0	0	21,067	21,067	0	609,149,458
2008	8,920,589	341,454,045	2,277,497	468,651,530	0	0	22,555	22,555	0	578,985,292
2009	9,161,827	302,080,127	2,072,036	419,144,411	0	0	18,216	18,216	0	521,142,641
2010	10,249,669	350,797,071	2,113,916	488,896,390	0	0	18,437	18,437	0	604,931,932
2011	11,002,297	390,966,836	2,095,331	528,958,286	0	0	20,124	20,124	0	666,795,085
2012	12,164,891	413,920,171	2,486,735	589,327,965	0	0	18,518	18,518	0	722,448,222
2013	13,704,101	433,673,782	2,383,479	605,028,689	0	0	17,418	17,418	0	747,617,924
2014	<b>13,183,485</b>	<b>415,163,450</b>	<b>3,821,289</b>	<b>594,306,119</b>	<b>0</b>	<b>0</b>	<b>17,419</b>	<b>17,419</b>	<b>0</b>	<b>734,896,374</b>
2015	13,146,402	395,026,273	3,772,240	569,593,560	0	0	17,015	17,015	0	704,382,637
2016	12,734,451	368,415,484	3,449,137	533,399,879	0	0	16,854	16,854	0	659,532,533
2017	12,645,728	360,036,048	3,365,631	522,144,582	0	0	16,858	16,858	0	650,120,637
2018	12,661,987	363,654,355	2,892,902	525,923,411	0	0	16,856	16,856	0	650,724,046
2019	12,548,941	350,849,637	2,779,912	508,497,268	0	0	14,230	14,230	0	638,048,572
2020	12,508,719	347,420,778	2,754,491	504,303,933	0	0	2,300	2,300	0	632,275,337
2021	12,455,856	343,255,018	2,721,752	498,726,498	0	0	1,475	1,475	0	628,547,854
2022	12,403,571	336,059,260	2,670,365	489,094,587	0	0	90	90	0	616,453,536
2023	12,444,307	340,441,361	2,717,108	494,716,568	0	0	89	89	0	625,623,887
2024	12,399,760	333,322,783	2,659,572	485,516,925	0	0	89	89	0	615,229,224
2025	12,403,578	333,274,347	2,662,453	485,530,393	0	0	86	86	0	614,185,214
2026	12,408,977	333,125,661	2,666,397	485,361,684	0	0	86	86	0	616,983,820
2027	12,421,511	331,679,596	2,652,307	483,691,992	0	0	84	84	0	610,945,663
2028	12,452,165	333,813,817	2,671,959	486,691,849	0	0	83	83	0	617,877,870
2029	12,561,833	342,726,421	2,735,994	499,350,606	0	0	81	81	0	635,662,737
2030	12,474,526	330,796,803	2,639,364	483,304,264	0	0	81	81	0	613,636,996
2031	12,658,963	345,275,081	2,732,994	504,394,898	0	0	80	80	0	638,342,168
2032	12,489,136	326,666,254	2,593,211	478,484,826	0	0	79	79	0	611,738,723
2033	12,714,321	346,581,311	2,740,230	506,912,258	0	0	79	79	0	642,959,196
2034	12,534,590	327,710,502	2,597,261	480,303,913	0	0	79	79	0	613,900,141
2035	12,985,680	367,545,179	2,878,264	537,451,955	0	0	77	77	0	677,919,779
<b>TOTAL</b>	<b>418,770,481</b>	<b>16,313,922,527</b>	<b>114,084,036</b>	<b>22,308,423,039</b>	<b>0</b>	<b>0</b>	<b>878,088</b>	<b>878,088</b>	<b>8,751,580</b>	<b>27,947,806,977</b>

## TABLE B-20A Calculation of Delta Water Rates

### Calculation in accordance with Article 53(i) of the Monterey Amendment

(Values in millions of dollars [\$] or millions of acre-feet [AF] discounted to 2013 at 4.610 percent per annum)

Procedure	Capital Cost Component	Minimum Operation, Maintenance, Power and Replacement Component (a)	Total Delta Water Rate
	[ 1 ]	[ 2 ]	[ 3 ]
<b>Commencing in 2014</b>			
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Table A Amounts during the Project Repayment Period	\$6,850.50 (b)      407.17 AF	\$5,852.79 (c)      407.17 AF	\$12,703.30      407.17 AF
Less, Project Power Revenues to be Realized During the Project Repayment Period.	(3,477.86)	(2,957.06)	(\$6,434.92)
Less, Delta Water Charges Paid and Project Water Table A Amounts, Prior to 2014	(2,532.23) (d)      (350.23) AF	(1,233.06)      (350.23) AF	(\$3,765.29)      (350.23) AF
<b>TOTAL</b>	<b>\$840.41      56.93 AF</b>	<b>\$1,662.68      56.93 AF</b>	<b>\$2,503.09      56.93 AF</b>
Rate Applicable in 2014	\$14.76 per acre-foot	\$29.20 per acre-foot	\$43.97 per acre-foot

### Calculation under original provisions, without the Monterey Amendment

(for Plumas County, and Empire)

Procedure	Capital Cost Component	Minimum Operation, Maintenance, Power and Replacement Component (a)	Total Delta Water Rate
	[ 4 ]	[ 5 ]	[ 6 ]
<b>Commencing in 2014</b>			
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Table A Amounts during the Project Repayment Period	\$6,834.31 (b)      407.17 AF	\$5,826.14 (c)      407.17 AF	\$12,660.45      407.17 AF
Less, Project Power Revenues to be Realized During the Project Repayment Period.	(3,477.86)	(2,957.06)	(\$6,434.92)
Less, Delta Water Charges Paid and Project Water Table A Amounts, Prior to 2014	(2,532.23) (d)      (350.23) AF	(1,233.06)      (350.23) AF	(\$3,765.29)      (350.23) AF
<b>TOTAL</b>	<b>\$824.22      56.93 AF</b>	<b>\$1,636.02      56.93 AF</b>	<b>\$2,460.24      56.93 AF</b>
Rate Applicable in 2014	\$14.48 per acre-foot	\$28.74 per acre-foot	\$43.21 per acre-foot

- (a) Considering that all operating costs of Project Conservation Facilities will not vary with annual amounts of Project water delivered, and therefore are properly classified as "Minimum" OMP&R Costs. OMP&R costs exclude amounts for Conservation RAS.
- (b) Including net credits of \$4,850,000 for settlements as to the magnitude of Project Capital costs incurred prior to December 31, 1960, and net credits of \$6,678,320 for settlement as to the magnitude of Project Capital costs incurred during the 1961 through 1978 period.
- (c) Includes conservation power costs and credits at San Luis.
- (d) Applying all Delta Water Charges paid prior to 1970 to reimburse Capital costs (the charge was not divided into components until 1970).

**TABLE B-20B Delta Water Rates by Facility**

(in dollars per acre-foot)

Item	Capital Cost Component	Minimum Operation, Maintenance, Power and Replacement Component	Total Delta Water Rate
	[1]	[2]	[3]
<b>Initial Conservation Facilities</b>			
Oroville Division			
Water Supply and power costs (a)	72.69	48.19	120.88
Less, Oroville Power Revenues	<u>-42.60</u>	<u>-21.66</u>	<u>-64.26</u>
Subtotal	30.09	26.54	56.63
Delta Facilities (b)	20.29	31.31	51.60
California Aqueduct, portion			
Reach 1	4.56	7.90	12.46
Reach 2A	2.67	1.07	3.73
Reach 2B	1.39	0.79	2.18
Reach 3	<u>0.96</u>	<u>0.48</u>	<u>1.43</u>
Subtotal	9.57	10.23	19.80
San Luis Facilities	13.60	12.61	26.21
Planning and preoperating costs through 2012	3.89	0.00	3.89
45,000 AF relinquished costs	0.28	0.47	0.75
Less, Capital Cost Credits	-1.88	0.00	-1.88
Less, Delta Water Charges paid prior to 2014	<u>-61.09</u>	<u>-51.94</u>	<u>-113.03</u>
Rate applicable in 2014	14.76	29.20	43.97

(a) Includes revenue received from non-SWP contractors.

(b) Includes 1. Delta Facility planning costs, 2. Delta Studies costs, and 3. Suisun Marsh Facilities Costs.



**TABLE B-21 Total Delta Water Charge for Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	14,000	50,050	177,100	241,150	0	0	0
1968	0	0	0	19,156	29,701	193,245	242,102	0	0	0
1969	0	0	0	30,324	44,096	215,483	289,903	0	0	0
1970	0	0	0	80,908	107,730	585,200	773,838	0	0	0
1971	0	0	0	57,320	123,080	637,120	817,520	0	0	0
1972	0	0	0	99,668	143,877	707,328	950,873	0	0	0
1973	0	0	0	120,880	167,099	782,167	1,070,146	0	0	0
1974	0	0	0	137,684	182,339	818,664	1,138,687	0	0	0
1975	0	0	0	146,204	187,324	804,123	1,137,651	0	0	0
1976	0	0	0	168,489	208,652	862,036	1,239,177	0	0	0
1977	0	0	0	172,931	208,645	827,062	1,208,638	0	0	0
1978	0	0	0	206,378	243,231	926,594	1,376,203	0	0	0
1979	0	0	0	237,771	273,208	1,005,955	1,516,934	0	0	0
1980	0	18,325	18,325	272,717	307,426	1,090,867	1,671,010	12,396	3,479	15,875
1981	0	25,440	25,440	415,564	469,768	1,589,984	2,475,316	18,068	10,414	28,482
1982	0	34,917	34,917	457,988	519,053	1,679,289	2,656,330	38,166	99,788	137,954
1983	0	12,035	12,035	316,703	359,775	1,114,795	1,791,273	38,004	68,902	106,906
1984	0	22,453	22,453	334,587	380,914	1,132,448	1,847,949	57,909	105,498	163,407
1985	0	22,001	22,001	381,970	435,728	1,244,939	2,062,637	106,103	192,937	299,040
1986	35,358	21,767	57,125	423,378	485,372	1,330,615	2,239,365	151,206	275,347	426,553
1987	0	22,984	22,984	430,024	493,786	1,304,900	2,228,710	185,355	336,664	522,019
1988	88,878	150,466	239,344	464,114	533,731	1,361,400	2,359,245	239,792	436,607	676,399
1989	102,688	305,328	408,016	513,853	591,760	1,491,833	2,597,446	331,518	602,402	933,920
1990	112,723	355,132	467,855	534,787	616,676	1,537,512	2,688,975	417,802	760,166	1,177,968
1991	129,296	395,515	524,811	603,028	681,067	1,667,194	2,951,289	443,403	806,745	1,250,148
1992	158,879	489,808	648,687	729,545	808,579	1,945,453	3,483,577	506,628	921,780	1,428,408
1993	172,457	530,778	703,235	771,894	840,958	1,990,673	3,603,525	507,825	923,957	1,431,782
1994	177,824	546,610	724,434	778,647	817,579	1,946,615	3,542,841	486,654	885,437	1,372,091
1995	203,738	713,497	917,235	874,946	874,946	2,083,205	3,833,097	520,801	947,567	1,468,368
1996	213,506	774,152	987,658	901,129	860,168	2,048,020	3,809,317	512,005	931,562	1,443,567
1997	250,558	866,141	1,116,699	1,041,633	951,056	2,264,420	4,257,109	566,105	1,029,994	1,596,099
1998	266,952	882,469	1,149,421	1,048,658	957,470	2,279,691	4,285,819	641,683	888,760	1,030,443
1999	290,688	923,459	1,214,147	1,084,480	990,178	2,357,566	4,432,224	589,391	1,072,362	1,661,753
2000	390,936	948,784	1,339,720	1,628,402	1,005,778	2,394,709	5,028,889	598,677	1,089,257	1,687,934
2001	496,412	1,097,880	1,594,292	1,868,283	1,005,998	2,395,234	5,269,515	598,809	1,089,496	1,688,305
2002	512,928	1,125,429	1,638,357	1,896,134	1,020,996	2,430,942	5,348,072	607,736	1,105,738	1,713,474
2003	511,059	1,112,692	1,623,751	1,856,232	999,510	2,379,785	5,235,527	594,946	1,082,469	1,677,415
2004	569,615	1,230,627	1,800,242	2,033,406	1,094,911	2,606,931	5,735,248	651,732	1,185,788	1,837,520
2005	573,729	1,219,893	1,793,622	2,081,144	1,084,212	2,581,456	5,746,812	645,364	1,174,201	1,819,565
2006	606,343	1,272,001	1,878,344	2,167,748	1,129,330	2,688,880	5,985,958	672,220	1,223,064	1,895,284
2007	623,728	1,291,247	1,914,975	2,198,222	1,145,206	2,726,679	6,070,107	681,671	1,240,257	1,921,928
2008	647,091	1,322,240	1,969,331	2,248,610	1,171,457	2,789,182	6,209,249	697,295	1,268,688	1,965,983
2009	717,087	1,446,549	2,163,636	2,457,420	1,280,240	3,048,190	6,785,850	762,047	1,386,499	2,148,546
2010	1,105,529	1,809,450	2,914,979	3,070,686	1,599,732	3,808,886	8,479,304	952,222	1,732,510	2,684,732
2011	1,216,921	1,993,865	3,210,786	3,380,086	1,760,920	4,192,667	9,333,673	1,048,166	1,907,076	2,955,242
2012	1,270,523	2,083,876	3,354,399	3,528,968	1,838,483	4,377,339	9,744,790	1,094,335	1,991,077	3,085,412
2013	1,344,704	2,207,862	3,552,566	3,735,010	1,945,825	4,632,915	10,313,750	1,158,229	2,107,328	3,265,557
<b>2014</b>	<b>1,276,099</b>	<b>2,097,420</b>	<b>3,373,519</b>	<b>3,544,457</b>	<b>1,846,552</b>	<b>4,396,552</b>	<b>9,787,561</b>	<b>1,099,138</b>	<b>1,999,815</b>	<b>3,098,953</b>
2015	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2016	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2017	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2018	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2019	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2020	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2021	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2022	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2023	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2024	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2025	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2026	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2027	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2028	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2029	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2030	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2031	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2032	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2033	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2034	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2035	1,276,099	2,099,618	3,375,717	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
<b>TOTAL</b>	<b>40,864,328</b>	<b>73,465,070</b>	<b>114,329,398</b>	<b>125,999,763</b>	<b>73,651,764</b>	<b>181,781,435</b>	<b>381,432,962</b>	<b>40,815,299</b>	<b>74,879,746</b>	<b>115,695,045</b>

**TABLE B-21 Total Delta Water Charge for Each Contractor**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	40,695	10,469	0	0	165,522	3,177	8,073	98,608	326,544
1969	61,267	3,281	0	0	337,686	4,200	8,805	102,478	517,717
1970	104,405	19,950	0	0	964,915	8,645	17,290	228,095	1,343,300
1971	129,596	21,720	0	0	1,377,772	9,412	20,272	264,260	1,823,032
1972	160,756	24,113	0	0	2,175,835	11,253	43,131	905,057	3,320,145
1973	195,541	26,664	0	386,638	2,373,167	13,333	27,553	373,307	3,396,203
1974	224,202	27,909	0	446,545	2,781,595	13,954	29,770	445,139	3,969,113
1975	329,688	27,413	0	481,560	3,041,048	14,620	33,702	827,551	4,755,622
1976	414,245	29,388	0	549,549	3,931,785	15,673	35,966	877,151	5,853,757
1977	312,532	28,195	0	569,545	4,071,218	15,977	40,289	626,210	5,663,966
1978	342,208	31,588	0	674,939	4,950,959	20,006	41,065	665,516	6,727,281
1979	395,523	34,294	0	772,757	5,901,986	22,863	45,725	771,613	7,944,761
1980	555,341	37,679	0	881,371	6,984,026	27,272	70,658	933,481	9,489,828
1981	740,789	54,204	0	1,351,487	11,140,730	41,556	77,692	1,373,168	14,779,626
1982	782,396	57,248	0	1,518,993	12,703,436	47,707	85,873	1,530,443	16,726,096
1983	543,462	38,004	0	1,057,789	9,141,315	35,471	58,273	78,506	10,952,820
1984	580,379	13,572	0	1,333,200	9,741,623	39,893	61,770	756,132	12,526,569
1985	667,740	42,441	0	1,540,611	11,403,920	48,100	69,320	644,383	14,416,515
1986	745,447	45,362	0	1,714,679	12,925,113	55,946	77,115	1,469,725	17,033,387
1987	762,180	44,485	0	1,766,065	13,410,817	59,314	77,108	1,503,601	17,623,570
1988	827,669	46,411	0	1,916,790	14,707,763	61,882	83,540	1,633,680	19,277,735
1989	921,621	49,728	0	2,125,033	16,312,361	66,304	92,825	1,821,693	21,389,565
1990	964,288	50,136	0	1,998,766	17,276,959	66,848	95,259	1,980,383	22,432,639
1991	1,023,374	53,208	0	2,121,239	18,335,590	70,944	101,096	2,101,729	23,807,180
1992	1,169,299	60,795	0	2,727,688	20,646,125	81,061	115,511	2,401,419	27,201,898
1993	1,172,060	60,939	0	2,734,129	20,694,874	81,252	115,784	2,407,089	27,266,127
1994	1,123,198	58,398	0	2,156,809	20,295,455	77,865	110,957	2,306,739	26,129,421
1995	1,202,009	62,497	0	2,803,995	21,223,694	83,328	118,743	2,468,598	27,962,864
1996	534,818	69,191	0	2,756,635	19,492,814	81,921	102,219	2,426,904	25,464,502
1997	1,208,521	67,162	0	3,047,908	22,148,973	90,576	129,072	2,683,338	29,375,550
1998	1,216,671	77,807	0	2,726,511	22,070,376	91,188	129,942	2,820,148	29,132,643
1999	1,258,233	69,974	0	2,819,648	22,824,299	94,303	134,381	2,793,715	29,994,553
2000	1,278,056	70,943	0	3,223,279	21,220,235	95,788	136,498	2,837,730	28,862,529
2001	1,278,336	71,058	0	2,864,700	21,110,372	95,809	136,528	2,838,352	28,395,155
2002	1,393,975	72,121	0	3,272,056	21,060,431	97,237	138,564	2,711,156	28,745,540
2003	1,364,640	70,550	0	3,203,191	20,617,243	95,192	135,648	2,654,103	28,140,567
2004	1,494,892	77,810	0	3,508,929	22,585,122	104,277	148,595	2,897,005	30,816,630
2005	1,480,284	77,153	0	3,474,640	22,307,136	232,331	147,143	2,739,621	30,458,308
2006	1,541,884	80,380	0	3,619,232	23,235,418	242,000	153,266	2,587,428	31,459,608
2007	1,563,559	81,479	0	3,670,110	23,562,051	253,717	155,421	2,615,486	31,901,823
2008	1,599,401	83,191	0	3,754,239	24,102,160	259,533	158,984	2,675,439	32,632,947
2009	1,747,923	90,846	0	4,102,863	26,340,321	283,634	173,747	2,923,885	35,663,219
2010	1,917,507	113,466	0	5,126,760	32,304,300	354,417	217,107	3,386,937	43,420,494
2011	2,110,714	123,965	0	5,643,329	35,559,263	390,127	238,982	3,728,203	47,794,583
2012	2,203,684	129,358	0	5,891,899	37,125,531	407,312	249,508	3,892,417	49,899,709
2013	2,332,348	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,813,142
2014	<b>2,125,733</b>	<b>129,639</b>	<b>0</b>	<b>5,917,760</b>	<b>37,288,481</b>	<b>409,099</b>	<b>250,603</b>	<b>3,845,708</b>	<b>49,967,023</b>
2015	1,993,837	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,835,127
2016	1,993,837	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,835,127
2017	1,993,837	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,835,127
2018	1,993,837	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,835,127
2019	1,993,837	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,835,127
2020	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2021	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2022	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2023	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2024	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2025	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2026	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2027	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2028	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2029	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2030	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2031	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2032	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2033	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2034	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
2035	1,817,974	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,659,264
<b>TOTAL</b>	<b>85,199,858</b>	<b>5,475,501</b>	<b>0</b>	<b>232,762,730</b>	<b>1,546,323,058</b>	<b>13,798,489</b>	<b>10,226,112</b>	<b>169,533,917</b>	<b>2,063,319,665</b>

**TABLE B-21 Total Delta Water Charge for Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	13,060	0	0	0	0	0	0	0	0
1969	0	17,804	0	0	0	0	0	0	0	0
1970	0	37,905	0	0	0	0	0	0	0	0
1971	0	48,508	0	0	0	0	0	0	0	0
1972	160,756	74,751	41,797	4,662	64,303	1,367	67,518	13,021	369,739	85,202
1973	222,207	107,163	51,552	7,279	79,994	2,577	95,104	26,131	54,908	14,338
1974	279,090	143,266	59,539	10,791	93,030	3,721	121,869	39,631	465,150	114,427
1975	319,822	166,307	63,964	13,250	100,515	4,752	140,722	50,989	479,733	119,705
1976	431,018	207,673	74,449	17,045	117,550	6,269	174,366	67,591	538,772	137,142
1977	469,922	226,502	79,144	19,079	122,180	6,861	189,848	77,255	540,410	139,097
1978	600,180	274,819	97,313	24,428	147,413	9,687	236,913	98,345	631,768	165,313
1979	720,173	320,077	115,033	29,836	171,470	11,889	284,640	117,285	714,457	189,760
1980	857,818	376,845	134,920	35,949	210,736	14,256	337,177	138,590	811,952	215,694
1981	1,355,100	592,631	218,713	57,637	343,292	22,946	534,813	211,396	1,237,658	330,644
1982	1,551,434	664,082	254,298	66,408	400,739	26,335	313,057	235,100	1,341,923	364,482
1983	1,110,994	472,521	184,293	47,759	291,367	19,002	434,517	163,925	943,775	252,096
1984	450,405	509,602	202,914	52,247	321,718	20,719	472,282	174,500	1,003,760	266,383
1985	565,881	591,346	240,344	61,540	381,970	24,474	551,734	200,605	1,152,983	308,405
1986	635,066	659,259	275,347	70,160	438,498	27,822	625,994	223,785	1,285,253	350,799
1987	652,450	676,176	288,131	73,104	467,095	29,064	648,002	228,654	1,319,729	364,779
1988	711,641	742,582	319,496	80,756	525,996	32,024	711,641	248,146	1,438,752	402,232
1989	2,083,593	830,453	362,565	91,333	605,021	36,301	803,932	276,155	1,607,864	454,180
1990	2,207,667	869,029	386,049	96,930	636,731	38,438	848,974	289,119	1,696,277	481,308
1991	2,454,678	961,298	409,704	102,869	675,746	40,793	900,994	306,835	1,819,725	510,800
1992	2,804,695	1,098,371	468,125	117,538	772,102	46,610	1,029,469	350,587	2,079,203	583,636
1993	2,811,318	1,100,964	469,230	117,815	773,925	46,720	1,031,900	351,415	2,084,113	585,014
1994	2,694,116	1,055,065	449,668	112,905	741,661	44,772	988,880	336,766	1,997,227	560,625
1995	2,883,156	1,129,097	481,220	120,826	793,702	47,914	1,058,269	360,394	2,137,369	599,963
1996	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
1997	3,133,957	1,227,316	523,081	131,336	862,744	52,082	1,150,325	391,745	2,323,295	652,153
1998	3,155,093	1,235,593	526,609	132,222	868,562	52,433	1,128,006	394,387	2,338,963	656,551
1999	3,262,870	1,277,800	544,598	136,739	898,233	54,224	1,187,034	407,859	2,418,863	678,979
2000	3,314,278	2,279,763	553,178	138,893	912,384	55,078	1,815,190	510,073	2,456,972	689,676
2001	3,315,004	2,280,263	553,299	138,924	912,584	55,090	1,815,587	510,185	2,457,510	689,827
2002	3,437,351	2,314,256	561,548	140,995	926,188	55,912	1,842,654	517,791	2,494,146	700,112
2003	3,365,016	2,265,555	549,731	138,028	906,698	54,735	1,803,877	506,894	2,441,659	685,379
2004	3,686,201	2,481,798	602,201	151,202	993,241	59,960	1,976,053	555,277	2,674,711	750,797
2005	3,650,179	2,457,547	596,316	149,725	983,535	59,374	1,966,744	549,850	2,648,574	743,459
2006	3,802,076	2,559,814	3,256,234	155,955	1,344,440	61,844	2,038,171	572,732	2,758,791	774,397
2007	3,855,524	2,595,798	3,302,008	158,148	1,363,339	62,714	2,066,822	580,783	2,797,573	785,284
2008	3,943,904	2,655,301	3,377,700	161,772	1,394,591	64,151	2,114,200	594,096	2,861,701	803,284
2009	4,310,140	2,901,877	3,691,358	176,795	1,524,095	70,109	2,310,528	649,264	3,127,443	877,878
2010	5,385,764	3,626,059	5,269,593	220,916	2,123,453	87,605	3,153,757	811,293	3,907,916	1,096,959
2011	5,928,431	3,991,418	5,800,554	243,174	2,337,412	96,432	3,471,528	893,038	4,301,676	1,207,488
2012	6,189,558	4,167,227	6,056,050	253,886	2,440,367	100,679	3,624,437	932,373	4,491,150	1,260,674
2013	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,836,054	986,811	4,753,371	1,334,279
2014	<b>6,368,143</b>	<b>4,185,518</b>	<b>6,082,630</b>	<b>255,000</b>	<b>2,451,078</b>	<b>101,120</b>	<b>3,640,346</b>	<b>936,466</b>	<b>4,510,863</b>	<b>1,266,208</b>
2015	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,772,242	936,466	4,510,863	1,266,208
2016	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,772,242	936,466	4,510,863	1,266,208
2017	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,772,242	936,466	4,510,863	1,266,208
2018	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,772,242	936,466	4,510,863	1,266,208
2019	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,772,242	936,466	4,510,863	1,266,208
2020	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2021	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2022	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2023	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2024	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2025	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2026	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2027	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2028	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2029	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2030	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2031	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2032	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2033	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2034	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
2035	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,948,105	936,466	4,510,863	1,266,208
TOTAL	242,253,074	151,886,499	182,192,447	10,058,350	87,355,482	3,986,036	137,805,212	35,907,230	180,347,069	50,429,606

**TABLE B-21 Total Delta Water Charge for Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	241,150
1968	0	0	0	13,060	0	1,050	875	1,925	0	583,631
1969	0	0	0	17,804	0	1,225	929	2,154	0	827,578
1970	0	0	0	37,905	0	3,848	1,995	5,843	0	2,160,886
1971	0	0	0	48,508	0	4,546	3,186	7,732	0	2,696,792
1972	0	2,043,211	0	2,926,327	0	4,929	3,778	8,707	0	7,206,052
1973	0	2,317,893	0	2,979,146	0	7,059	4,444	11,503	0	7,456,998
1974	0	4,231,933	0	5,562,447	0	8,336	4,931	13,267	0	10,683,514
1975	0	5,073,286	0	6,533,045	0	9,416	5,117	14,533	0	12,440,851
1976	0	6,422,167	0	8,194,042	0	7,004	5,780	12,784	0	15,299,760
1977	0	7,104,278	0	8,974,576	0	16,917	5,827	22,744	0	15,869,924
1978	0	9,016,389	0	11,302,568	0	12,635	6,844	19,479	0	19,425,531
1979	0	10,935,192	0	13,609,812	0	16,575	7,773	24,348	0	23,095,855
1980	84,294	13,102,796	12,396	16,333,423	0	19,834	8,801	28,635	0	27,557,096
1981	140,930	20,910,099	36,136	25,991,995	0	21,682	13,370	35,052	0	43,335,911
1982	167,929	23,998,560	57,248	29,441,595	0	16,117	14,694	30,811	0	49,027,703
1983	124,148	17,203,307	50,672	21,298,366	0	15,202	10,134	25,336	0	34,186,736
1984	138,982	18,766,458	64,344	22,444,314	20,590	15,442	10,681	46,713	0	37,051,405
1985	166,935	22,050,974	84,882	26,382,073	24,050	16,976	12,166	53,192	0	43,235,458
1986	195,056	25,089,658	120,965	29,997,662	31,753	18,145	13,457	63,355	0	49,817,447
1987	207,598	26,095,043	148,284	31,198,109	37,071	17,794	13,642	68,507	0	51,663,899
1988	233,604	28,781,238	201,116	34,429,224	46,722	18,565	14,852	80,139	0	57,062,086
1989	268,530	32,505,376	265,215	40,190,518	61,184	19,891	16,576	97,651	0	65,617,116
1990	289,119	33,616,369	334,242	41,790,252	63,506	20,055	17,381	100,942	0	68,658,631
1991	306,835	35,676,185	354,722	44,521,184	170,267	21,283	19,155	210,705	0	73,265,317
1992	350,587	40,763,329	405,303	50,869,555	194,545	24,318	22,697	241,560	0	83,873,685
1993	351,415	40,859,579	406,260	50,989,668	195,005	24,376	23,563	242,944	0	84,237,281
1994	336,766	39,156,173	389,323	48,863,947	186,875	23,360	23,360	233,595	0	80,866,329
1995	360,394	41,903,674	416,641	52,292,619	199,987	24,999	26,040	251,026	0	86,725,209
1996	0	41,195,923	409,604	51,055,092	196,610	24,576	26,624	247,810	0	83,007,946
1997	0	45,548,810	447,746	56,444,590	214,918	27,179	30,223	272,314	0	93,063,361
1998	0	45,859,992	450,529	57,394,940	107,459	27,356	31,537	166,352	0	93,159,618
1999	47,152	47,422,430	466,491	59,403,272	226,327	28,291	33,820	288,438	0	96,994,387
2000	71,841	48,169,576	478,942	61,445,844	229,892	69,207	35,708	334,807	0	98,699,723
2001	95,809	48,180,135	479,047	61,483,264	229,942	83,833	37,187	350,962	0	98,781,493
2002	97,237	48,898,394	486,188	62,472,772	233,371	85,083	39,185	357,639	0	100,275,854
2003	118,989	47,869,379	475,957	61,181,894	228,460	83,293	39,743	351,496	0	98,210,650
2004	156,416	52,438,419	521,386	67,047,662	250,266	92,048	0	342,314	0	107,579,616
2005	167,795	51,925,988	516,291	66,405,377	247,820	717,290	0	965,110	0	107,188,794
2006	188,222	51,397,939	537,776	69,448,391	258,133	32,606	8,699	299,438	0	110,967,023
2007	204,501	52,120,469	545,336	70,438,299	268,738	33,950	19,600	322,288	0	112,569,420
2008	482,528	53,315,217	557,837	72,326,282	274,736	794,785	56,138	1,125,659	0	116,229,541
2009	527,337	58,266,144	609,638	79,042,606	292,626	844,842	63,417	1,200,885	0	127,004,742
2010	658,937	72,806,845	761,778	99,910,875	365,653	1,054,033	81,825	1,501,511	0	158,911,895
2011	725,331	80,142,822	838,533	109,977,837	414,001	1,185,940	92,561	1,692,502	0	174,964,623
2012	757,280	83,672,846	875,468	114,821,995	424,826	1,216,951	100,037	1,741,814	0	182,648,119
2013	801,494	88,558,170	926,583	121,525,993	444,760	1,274,052	109,975	1,828,787	0	193,299,795
2014	760,603	84,040,101	879,310	115,477,386	431,273	1,235,416	108,033	1,774,722	0	183,479,164
2015	760,603	84,040,101	879,310	115,609,282	422,070	1,209,052	112,353	1,743,475	0	183,450,115
2016	760,603	84,040,101	879,310	115,609,282	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2017	760,603	84,040,101	879,310	115,609,282	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2018	760,603	84,040,101	879,310	115,609,282	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2019	760,603	84,040,101	879,310	115,609,282	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2020	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2021	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2022	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2023	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2024	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2025	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2026	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2027	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2028	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2029	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2030	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2031	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2032	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2033	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2034	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
2035	760,603	84,040,101	879,310	115,785,145	422,070	1,209,052	116,675	1,747,797	0	183,454,437
TOTAL	25,557,257	3,374,290,884	33,077,699	4,515,146,845	15,434,836	34,712,396	3,672,213	53,819,445	0	7,243,743,360

**TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County	Santa Barbara County	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	29,131	40,505	69,636	25,436	30,176	100,035	155,647	13,126	24,392	37,518
1989	48,804	69,621	118,425	43,343	51,681	170,303	265,327	26,828	49,634	76,462
1990	41,166	60,482	101,648	38,407	51,185	149,440	239,032	27,956	51,795	79,751
1991	63,389	92,401	155,790	62,470	81,991	235,712	380,173	44,887	83,709	128,596
1992	84,320	126,227	210,547	89,247	115,208	325,629	530,084	61,137	113,925	175,062
1993	90,152	137,473	227,625	98,432	125,174	347,457	571,063	67,725	126,662	194,387
1994	91,785	141,222	233,007	102,021	126,216	352,415	580,652	81,420	159,156	240,576
1995	108,311	181,787	290,098	126,001	149,377	416,956	692,334	131,675	270,726	402,401
1996	132,305	232,343	364,648	158,514	180,787	505,042	844,343	242,654	534,449	777,103
1997	135,556	237,492	373,048	171,263	187,162	522,127	880,552	141,810	846,617	988,427
1998	130,346	228,366	358,712	164,682	179,971	502,065	846,718	136,361	814,087	950,448
1999	182,507	316,416	498,923	227,072	248,031	691,830	1,166,933	188,835	1,124,110	1,312,945
2000	238,571	364,418	602,989	260,766	284,875	794,730	1,340,371	218,359	1,364,019	1,582,378
2001	234,773	358,616	593,389	561,965	280,341	782,078	1,624,384	214,883	1,342,304	1,557,187
2002	257,520	391,851	649,371	610,230	288,977	806,174	1,705,381	221,503	1,383,661	1,605,164
2003	268,151	408,027	676,178	635,422	300,907	839,455	1,775,784	230,647	1,440,782	1,671,429
2004	268,425	408,444	676,869	636,070	301,214	840,312	1,777,596	230,883	1,442,252	1,673,135
2005	253,413	385,602	639,015	610,756	284,369	793,318	1,688,443	217,970	1,361,594	1,579,564
2006	274,219	417,261	691,480	660,900	307,716	858,451	1,827,067	235,866	1,473,385	1,709,251
2007	177,891	270,066	447,957	441,730	197,505	550,975	1,190,210	152,478	975,872	1,128,350
2008	254,590	386,862	641,452	773,686	288,283	803,089	1,865,058	223,659	1,369,892	1,593,551
2009	285,324	434,158	719,482	687,665	320,178	893,215	1,901,058	245,418	1,533,052	1,778,470
2010	273,015	415,428	688,443	657,998	306,365	854,681	1,819,044	234,831	1,466,914	1,701,745
2011	294,866	448,677	743,543	710,662	330,884	923,085	1,964,631	253,625	1,584,318	1,837,943
2012	383,092	455,983	839,075	753,264	330,355	933,048	2,016,667	229,311	1,456,050	1,685,361
2013	704,880	839,439	1,544,319	1,389,005	609,731	1,716,367	3,715,103	422,721	2,682,014	3,104,735
2014	<b>753,983</b>	<b>898,450</b>	<b>1,652,433</b>	<b>1,483,870</b>	<b>650,495</b>	<b>1,831,167</b>	<b>3,965,532</b>	<b>450,891</b>	<b>2,858,402</b>	<b>3,309,293</b>
2015	817,960	974,686	1,792,646	1,609,780	705,691	1,986,546	4,302,017	489,150	3,100,944	3,590,094
2016	824,384	982,340	1,806,724	1,622,423	711,233	2,002,148	4,335,804	492,992	3,125,298	3,618,290
2017	814,351	970,385	1,784,736	1,602,677	702,577	1,977,780	4,283,034	486,992	3,087,261	3,574,253
2018	733,806	874,407	1,608,213	1,444,160	633,087	1,782,163	3,859,410	438,825	2,781,909	3,220,734
2019	774,124	922,450	1,696,574	1,523,509	667,872	1,880,083	4,071,464	462,936	2,934,759	3,397,695
2020	730,253	870,173	1,600,426	1,437,168	630,022	1,773,535	3,840,725	436,700	2,768,440	3,205,140
2021	727,161	866,488	1,593,649	1,431,082	627,354	1,766,024	3,824,460	434,851	2,756,716	3,191,567
2022	701,523	835,938	1,537,461	1,380,626	605,235	1,703,759	3,689,620	419,519	2,659,521	3,079,040
2023	706,062	841,347	1,547,409	1,389,560	609,151	1,714,783	3,713,494	422,234	2,676,730	3,098,964
2024	686,024	817,470	1,503,494	1,350,124	591,864	1,666,118	3,608,106	410,251	2,600,765	3,011,016
2025	630,028	750,744	1,380,772	1,239,920	543,553	1,530,122	3,313,595	376,764	2,388,478	2,765,242
2026	591,105	704,364	1,295,469	1,163,319	509,973	1,435,592	3,108,884	353,488	2,240,920	2,594,408
2027	642,093	765,121	1,407,214	1,263,665	553,962	1,559,423	3,377,050	383,979	2,434,218	2,818,197
2028	510,987	608,895	1,119,882	1,005,644	440,852	1,241,013	2,687,509	305,577	1,937,188	2,242,765
2029	550,183	655,601	1,205,784	1,082,784	474,668	1,336,207	2,893,659	329,016	2,085,784	2,414,800
2030	65,659	78,240	143,899	129,220	56,647	159,464	345,331	39,265	248,918	288,183
2031	65,657	78,237	143,894	129,215	56,645	159,457	345,317	39,263	248,909	288,172
2032	65,658	78,238	143,896	129,217	56,646	159,460	345,323	39,264	248,912	288,176
2033	65,721	78,314	144,035	129,343	56,701	159,615	345,659	39,302	249,155	288,457
2034	65,716	78,308	144,024	129,332	56,696	159,602	345,630	39,299	249,135	288,434
2035	65,705	78,294	143,999	129,310	56,686	159,574	345,570	39,292	249,091	288,383
<b>TOTAL</b>	<b>16,894,645</b>	<b>21,657,657</b>	<b>38,552,302</b>	<b>33,502,955</b>	<b>15,956,269</b>	<b>44,851,624</b>	<b>94,310,848</b>	<b>11,426,418</b>	<b>69,006,824</b>	<b>80,433,242</b>



**TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0
1988	33,986	1,657	0	67,288	726,501	2,228	2,851	66,748	901,259
1989	59,273	2,785	0	116,689	1,251,452	3,733	4,927	116,736	1,555,595
1990	53,349	2,419	0	287,811	947,351	3,248	4,367	109,118	1,407,663
1991	82,252	3,731	0	359,380	1,564,983	5,035	6,771	168,217	2,190,369
1992	112,566	5,127	0	452,691	2,153,423	6,927	9,285	230,217	2,970,236
1993	119,670	5,459	0	272,449	2,491,672	7,381	9,894	244,813	3,151,338
1994	118,265	5,379	0	244,671	2,485,820	7,300	9,766	241,933	3,113,134
1995	139,226	6,340	0	317,885	2,894,181	8,599	11,490	284,798	3,662,519
1996	169,333	7,703	0	354,341	2,722,240	10,461	13,978	346,367	3,624,423
1997	165,364	7,980	0	366,285	2,673,847	10,826	14,465	357,986	3,596,753
1998	159,011	7,672	0	352,211	2,571,110	10,410	13,909	344,232	3,458,555
1999	218,784	10,373	0	485,897	3,371,115	14,376	19,166	476,017	4,595,728
2000	251,339	11,735	0	557,296	3,620,348	16,500	21,990	546,406	5,025,614
2001	247,338	11,547	0	548,424	3,461,158	16,238	21,640	537,707	4,844,052
2002	273,542	11,904	0	565,321	3,496,023	16,737	22,306	521,659	4,907,492
2003	284,834	12,395	0	588,659	3,640,346	17,428	23,227	543,193	5,110,082
2004	285,125	12,408	0	589,259	3,644,059	17,446	23,251	543,748	5,115,296
2005	269,179	11,714	0	556,305	3,431,851	39,485	21,951	488,483	4,818,968
2006	291,279	12,676	0	601,979	3,713,614	42,726	23,753	528,589	5,214,616
2007	187,144	8,113	0	383,463	2,314,841	34,088	15,230	285,915	3,228,794
2008	271,383	11,832	0	563,171	3,478,837	41,080	22,094	445,805	4,834,202
2009	303,076	13,189	0	626,357	3,864,004	46,037	24,715	497,108	5,374,486
2010	257,209	12,620	0	599,335	3,631,924	44,051	23,648	440,950	5,009,737
2011	277,794	13,630	0	647,304	3,922,606	47,577	25,542	476,242	5,410,695
2012	271,192	12,709	0	666,489	5,450,478	40,125	23,964	510,822	6,975,779
2013	484,429	23,395	0	1,226,390	9,620,630	73,823	44,101	882,509	12,355,277
<b>2014</b>	<b>502,213</b>	<b>24,980</b>	<b>0</b>	<b>1,311,071</b>	<b>10,269,483</b>	<b>78,931</b>	<b>47,126</b>	<b>931,305</b>	<b>13,165,109</b>
2015	544,827	27,100	0	1,422,318	11,140,873	85,628	51,125	1,010,328	14,282,199
2016	549,106	27,312	0	1,433,489	11,228,370	86,301	51,526	1,018,263	14,394,367
2017	542,423	26,980	0	1,416,042	11,091,713	85,251	50,899	1,005,870	14,219,178
2018	488,773	24,312	0	1,275,986	9,994,663	76,819	45,865	906,383	12,812,801
2019	515,629	25,647	0	1,346,094	10,543,812	81,039	48,385	956,183	13,516,789
2020	486,407	24,194	0	1,269,808	9,946,274	76,447	45,643	901,994	12,750,767
2021	484,347	24,091	0	1,264,430	9,904,153	76,123	45,450	898,174	12,696,768
2022	467,270	23,242	0	1,219,850	9,554,957	73,439	43,847	866,507	12,249,112
2023	470,294	23,392	0	1,227,743	9,616,785	73,914	44,131	872,114	12,328,373
2024	456,947	22,728	0	1,192,900	9,343,862	71,817	42,878	847,364	11,978,496
2025	419,649	20,873	0	1,095,530	8,581,171	65,955	39,378	778,198	11,000,754
2026	393,723	19,584	0	1,027,849	8,051,032	61,880	36,946	730,121	10,321,135
2027	427,685	21,273	0	1,116,509	8,745,501	67,218	40,133	793,100	11,211,419
2028	340,358	16,929	0	888,535	6,959,804	53,493	31,938	631,161	8,922,218
2029	366,466	18,228	0	956,692	7,493,669	57,596	34,388	679,576	9,606,615
2030	43,734	2,175	0	114,172	894,298	6,874	4,104	81,101	1,146,458
2031	43,733	2,175	0	114,168	894,263	6,873	4,104	81,098	1,146,414
2032	43,733	2,175	0	114,169	894,276	6,873	4,104	81,099	1,146,429
2033	43,776	2,177	0	114,280	895,146	6,880	4,108	81,178	1,147,545
2034	43,772	2,177	0	114,271	895,076	6,880	4,107	81,171	1,147,454
2035	43,765	2,177	0	114,251	894,920	6,878	4,107	81,157	1,147,255
<b>TOTAL</b>	<b>13,104,572</b>	<b>630,413</b>	<b>0</b>	<b>32,547,507</b>	<b>240,978,515</b>	<b>1,796,974</b>	<b>1,182,573</b>	<b>24,549,763</b>	<b>314,790,317</b>

**TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	64,266	57,111	27,032	7,656	44,492	2,154	55,996	16,240	151,182	39,907
1989	205,668	98,720	46,993	13,263	78,104	3,763	97,138	27,981	259,860	69,104
1990	185,010	87,808	42,449	11,905	69,970	3,385	87,327	24,956	231,650	61,851
1991	296,854	140,371	65,947	18,548	108,704	5,236	135,623	38,641	363,310	96,172
1992	402,015	234,421	89,358	25,192	147,297	7,053	183,813	52,160	491,537	130,372
1993	424,871	247,076	93,981	26,566	154,919	7,437	193,361	55,045	517,379	137,298
1994	424,023	247,222	94,502	26,865	155,776	7,431	194,191	54,968	525,394	139,422
1995	500,084	290,998	111,730	31,822	184,170	8,769	229,530	64,852	623,848	165,593
1996	606,388	353,132	135,428	38,634	223,237	10,640	278,178	78,696	760,333	201,821
1997	626,151	362,776	139,565	39,802	230,058	10,972	286,779	81,146	808,482	207,472
1998	602,091	348,838	134,202	38,273	221,218	10,550	275,761	78,028	777,418	199,501
1999	826,108	479,470	184,524	52,650	304,166	14,475	642,815	107,060	1,041,566	277,200
2000	940,325	1,150,965	210,453	60,212	346,906	16,486	736,157	121,898	1,191,538	316,860
2001	925,355	1,132,642	207,102	59,254	341,384	16,224	724,438	135,581	1,172,568	311,816
2002	974,814	1,167,539	213,483	61,079	351,902	16,724	746,758	139,071	1,208,696	321,423
2003	1,015,056	1,215,738	222,296	63,601	366,429	17,415	777,586	144,812	1,258,593	334,692
2004	1,016,092	1,216,978	222,523	63,666	366,803	17,432	778,379	144,960	1,259,877	335,033
2005	959,268	1,148,920	210,078	60,105	346,290	16,457	734,849	136,853	1,189,420	316,297
2006	1,038,026	1,243,248	212,645	65,040	501,286	17,809	795,182	148,089	1,287,074	342,266
2007	666,215	820,799	1,036,396	41,723	354,543	11,413	520,847	95,550	825,932	219,727
2008	999,433	1,167,531	1,157,440	61,924	478,719	17,175	757,686	144,009	1,367,672	325,069
2009	1,080,062	1,293,596	1,262,793	67,674	521,586	18,529	827,383	154,087	1,339,196	356,126
2010	1,033,467	1,283,788	1,283,384	64,754	524,108	17,731	824,481	147,438	1,281,421	340,762
2011	1,116,181	1,336,855	1,386,101	69,937	566,054	19,149	890,469	159,239	1,383,979	368,035
2012	1,090,934	915,850	1,073,158	67,263	523,945	18,453	731,452	154,732	1,323,822	351,925
2013	2,009,977	1,687,999	1,985,496	123,887	965,459	33,958	1,347,273	284,729	2,436,140	647,551
2014	<b>2,231,951</b>	<b>1,800,967</b>	<b>2,118,348</b>	<b>132,169</b>	<b>1,030,991</b>	<b>36,232</b>	<b>1,437,696</b>	<b>303,861</b>	<b>2,602,055</b>	<b>691,649</b>
2015	2,421,337	1,953,783	2,298,095	143,384	1,118,473	39,306	1,559,688	329,644	2,822,846	750,337
2016	2,440,354	1,969,128	2,316,143	144,510	1,127,257	39,615	1,571,937	332,233	2,845,015	756,230
2017	2,410,653	1,945,162	2,287,954	142,751	1,113,538	39,133	1,552,806	328,190	2,810,390	747,026
2018	2,172,222	1,752,772	2,061,659	128,632	1,003,401	35,262	1,399,222	295,729	2,532,422	673,140
2019	2,291,573	1,849,076	2,174,936	135,700	1,058,532	37,200	1,476,101	311,978	2,671,564	710,125
2020	2,161,705	1,744,286	2,051,678	128,009	998,543	35,092	1,392,448	294,298	2,520,161	669,881
2021	2,152,551	1,736,899	2,042,989	127,467	994,314	34,943	1,386,551	293,051	2,509,489	667,044
2022	2,076,657	1,675,660	1,970,958	122,973	959,257	33,711	1,337,665	282,719	2,421,010	643,526
2023	2,090,095	1,686,503	1,983,712	123,769	965,464	33,929	1,346,320	284,549	2,436,676	647,690
2024	2,030,778	1,638,640	1,927,415	120,256	938,065	32,966	1,308,112	276,473	2,367,524	629,309
2025	1,865,016	1,504,886	1,770,090	110,440	861,495	30,275	1,201,337	253,906	2,174,275	577,941
2026	1,749,797	1,411,916	1,660,735	103,617	808,273	28,405	1,127,120	238,220	2,039,950	542,236
2027	1,900,731	1,533,705	1,803,987	112,555	877,993	30,855	1,224,343	258,768	2,215,912	589,009
2028	1,512,631	1,220,546	1,435,641	89,573	698,720	24,555	974,351	205,932	1,763,457	468,742
2029	1,628,661	1,314,170	1,545,764	96,444	752,317	26,439	1,049,091	221,728	1,898,726	504,698
2030	194,365	156,834	184,472	11,510	89,782	3,155	125,199	26,461	226,595	60,231
2031	194,358	156,828	184,465	11,509	89,778	3,155	125,194	26,460	226,586	60,229
2032	194,360	156,830	184,468	11,509	89,780	3,155	125,196	26,460	226,589	60,229
2033	194,550	156,983	184,647	11,521	89,867	3,158	125,318	26,486	226,810	60,288
2034	194,534	156,970	184,633	11,520	89,860	3,158	125,308	26,484	226,792	60,283
2035	194,500	156,943	184,600	11,518	89,844	3,157	125,286	26,480	226,752	60,273
<b>TOTAL</b>	<b>54,332,113</b>	<b>47,363,878</b>	<b>45,407,448</b>	<b>3,292,631</b>	<b>24,323,069</b>	<b>903,676</b>	<b>35,949,741</b>	<b>7,460,931</b>	<b>65,069,483</b>	<b>17,243,411</b>

**TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	24,019	2,642,354	18,118	3,150,527	1,336	552	853	2,741	0	4,317,328
1989	42,040	4,587,641	34,565	5,564,840	0	918	1,454	2,372	0	7,583,021
1990	38,023	4,037,980	34,994	4,917,308	2,535	800	1,283	4,618	0	6,750,020
1991	59,122	6,259,893	54,115	7,642,536	9,945	1,243	2,027	13,215	0	10,510,679
1992	80,131	8,435,312	72,892	10,351,553	13,671	1,710	2,806	18,187	0	14,255,669
1993	84,371	8,885,273	76,858	10,904,435	14,608	1,827	3,026	19,461	0	15,068,309
1994	85,698	8,926,755	76,794	10,959,041	14,409	1,801	3,070	19,280	0	15,145,690
1995	101,792	10,539,430	90,436	12,943,054	16,958	2,119	3,705	22,782	0	18,013,188
1996	124,074	12,810,359	109,783	15,730,703	20,640	2,579	4,620	27,839	0	21,369,059
1997	28,259	13,168,230	112,960	16,102,652	21,382	2,674	4,872	28,928	0	21,970,360
1998	27,174	12,662,268	108,619	15,483,941	20,562	2,571	4,685	27,818	0	21,126,192
1999	53,545	17,454,651	149,123	21,587,353	28,348	3,543	6,765	38,656	0	29,200,538
2000	70,117	19,805,800	168,259	25,135,976	32,271	9,794	7,996	50,061	0	33,737,389
2001	69,001	19,490,499	165,580	24,751,444	31,757	9,638	7,869	49,264	0	33,419,720
2002	71,126	20,091,004	170,682	25,534,301	32,736	9,935	8,112	50,783	0	34,452,492
2003	74,063	20,920,403	177,728	26,588,412	34,087	10,345	8,446	52,878	0	35,874,763
2004	74,138	20,941,743	177,910	26,615,534	34,121	10,356	8,456	52,933	0	35,911,363
2005	69,992	19,770,593	167,960	25,127,082	32,213	9,776	7,983	49,972	0	33,903,044
2006	75,738	20,330,228	181,750	27,239,381	34,858	10,579	8,638	54,075	0	36,735,870
2007	45,192	12,752,863	116,415	17,507,615	22,362	7,007	5,579	34,948	0	23,537,874
2008	250,631	19,303,204	173,561	26,204,054	32,180	9,751	7,973	49,904	0	35,188,221
2009	78,805	21,153,536	189,110	28,342,483	36,270	11,008	8,988	56,266	0	38,172,245
2010	75,405	20,240,944	180,952	27,252,635	34,705	10,532	8,600	53,837	0	36,525,441
2011	81,440	21,860,932	195,434	29,433,805	37,482	11,375	9,289	58,146	0	39,448,763
2012	215,055	22,686,017	191,051	29,343,659	35,313	101,156	12,344	148,812	0	41,009,352
2013	395,709	39,971,232	351,635	52,241,045	64,961	186,087	23,079	274,127	0	73,234,606
2014	422,653	42,670,698	375,172	55,854,442	69,454	198,959	25,501	293,914	0	78,240,723
2015	458,516	46,291,407	407,006	60,593,822	75,347	215,841	27,665	318,853	0	84,879,631
2016	462,117	46,654,965	410,203	61,069,707	75,939	217,536	27,882	321,357	0	85,546,249
2017	456,493	46,087,144	405,210	60,326,450	75,015	214,889	27,543	317,447	0	84,505,098
2018	411,342	41,528,795	365,132	54,359,730	67,595	193,635	24,819	286,049	0	76,146,937
2019	433,943	43,810,562	385,194	57,346,484	71,309	204,274	26,182	301,765	0	80,330,771
2020	409,351	41,327,732	363,364	54,096,548	67,268	192,697	24,698	284,663	0	75,778,269
2021	407,617	41,152,715	361,825	53,867,455	66,983	191,881	24,594	283,458	0	75,457,357
2022	393,246	39,701,773	349,068	51,968,223	64,622	185,116	23,727	273,465	0	72,796,921
2023	395,790	39,958,676	351,327	52,304,500	65,040	186,314	23,880	275,234	0	73,267,974
2024	384,558	38,824,655	341,357	50,820,108	63,194	181,026	23,203	267,423	0	71,188,643
2025	353,168	35,655,597	313,493	46,671,919	58,036	166,250	21,309	245,595	0	65,377,877
2026	331,350	33,452,821	294,126	43,788,566	54,450	155,979	19,992	230,421	0	61,338,883
2027	359,932	36,338,405	319,497	47,565,692	59,147	169,434	21,717	250,298	0	66,629,870
2028	286,439	28,918,662	254,260	37,853,509	47,070	134,838	17,282	199,190	0	53,025,073
2029	308,411	31,136,922	273,764	40,757,135	50,681	145,181	18,608	214,470	0	57,092,463
2030	36,806	3,715,895	32,671	4,863,976	6,048	17,326	2,221	25,595	0	6,813,442
2031	36,804	3,715,751	32,670	4,863,787	6,048	17,325	2,221	25,594	0	6,813,178
2032	36,805	3,715,802	32,670	4,863,853	6,048	17,326	2,221	25,595	0	6,813,272
2033	36,841	3,719,421	32,702	4,868,592	6,054	17,342	2,223	25,619	0	6,819,907
2034	36,838	3,719,128	32,700	4,868,208	6,054	17,341	2,223	25,618	0	6,819,368
2035	36,831	3,718,478	32,694	4,867,356	6,052	17,338	2,222	25,612	0	6,818,175
<b>TOTAL</b>	<b>8,890,511</b>	<b>1,065,545,148</b>	<b>9,313,389</b>	<b>1,385,095,431</b>	<b>1,727,164</b>	<b>3,487,524</b>	<b>564,451</b>	<b>5,779,138</b>	<b>0</b>	<b>1,918,961,277</b>

**TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	21,132	76,669	0	0	0
1963	0	0	0	199,726	190,272	447,723	837,721	0	0	0
1964	0	0	0	263,282	277,455	621,356	1,162,093	6,696	21,667	28,363
1965	0	0	0	373,816	404,324	1,158,090	1,936,230	13,756	36,029	49,785
1966	18,063	0	18,063	419,467	421,723	1,412,953	2,254,143	26,524	61,349	87,873
1967	41,574	0	41,574	553,115	548,491	1,863,199	2,964,805	56,469	118,263	174,731
1968	128,628	0	128,628	682,975	633,184	2,178,466	3,494,625	115,961	229,807	345,768
1969	254,715	0	254,715	817,657	583,436	2,298,736	3,699,829	185,156	358,861	544,017
1970	277,547	0	277,547	904,001	640,297	2,787,966	4,332,265	200,150	387,675	587,825
1971	227,474	0	227,474	845,508	675,194	2,807,017	4,327,719	202,413	392,912	595,325
1972	224,978	0	224,978	929,583	822,396	3,027,748	4,779,727	209,057	406,589	615,646
1973	221,091	31,366	252,457	916,058	716,492	3,120,787	4,753,337	206,557	402,724	609,281
1974	240,498	32,938	273,437	956,678	746,932	3,325,023	5,028,633	208,545	407,090	615,635
1975	237,459	36,291	273,750	1,015,119	793,055	3,214,046	5,022,220	225,895	439,873	665,768
1976	271,292	40,836	312,127	1,128,201	943,464	3,362,541	5,434,206	228,976	447,299	676,275
1977	293,627	45,096	338,723	1,096,854	922,203	3,303,461	5,322,518	238,699	468,721	707,420
1978	273,870	49,178	323,048	1,185,691	935,818	3,712,581	5,834,090	245,331	484,259	729,590
1979	289,479	53,340	342,819	1,282,302	1,009,566	3,819,533	6,111,402	243,110	483,437	726,547
1980	310,846	86,073	396,919	1,435,315	1,173,798	4,119,072	6,728,185	282,254	540,553	822,807
1981	347,781	112,848	460,629	1,543,891	1,349,125	4,507,566	7,400,582	307,065	596,671	903,736
1982	438,335	141,835	580,171	1,624,257	1,369,535	4,941,393	7,935,185	328,215	682,545	1,010,760
1983	354,787	163,294	518,081	1,494,587	1,260,138	4,910,241	7,664,965	357,218	702,083	1,059,301
1984	467,336	246,698	714,034	1,804,651	1,478,395	6,870,249	10,153,295	409,529	801,057	1,210,586
1985	736,074	386,306	1,122,380	2,302,531	2,225,097	7,796,485	12,324,113	500,696	969,931	1,470,626
1986	1,120,086	714,246	1,834,332	2,171,195	2,014,104	8,193,845	12,379,143	536,751	1,038,031	1,574,782
1987	1,773,801	1,582,227	3,356,028	2,667,756	2,505,662	7,980,254	13,153,672	570,644	1,148,974	1,719,618
1988	2,349,572	2,524,763	4,874,335	2,728,966	2,774,430	7,830,285	13,333,681	673,071	1,439,620	2,119,691
1989	2,548,764	3,701,384	6,250,149	2,712,956	2,515,471	7,578,849	12,807,277	772,570	1,814,759	2,587,329
1990	2,900,024	3,848,934	6,748,958	3,148,292	2,929,775	8,355,392	14,433,459	933,367	2,046,370	2,979,737
1991	2,941,321	4,170,227	7,111,548	2,420,225	2,384,247	6,430,833	11,235,305	979,709	2,366,841	3,346,550
1992	2,797,728	4,144,992	6,942,720	2,894,699	2,927,115	7,656,940	13,478,754	1,118,807	2,526,861	3,645,668
1993	2,855,497	4,172,491	7,027,988	3,751,475	2,977,354	8,849,995	15,578,824	1,185,665	2,726,057	3,911,722
1994	2,987,937	4,225,292	7,213,229	3,788,568	3,586,255	9,613,545	16,988,368	1,335,974	3,518,042	4,854,015
1995	2,961,322	4,405,219	7,366,541	4,037,208	3,313,350	8,393,828	15,744,386	1,647,817	6,195,415	7,843,231
1996	3,045,021	4,898,210	7,943,232	3,645,047	3,178,398	9,228,554	16,051,998	2,592,042	15,232,542	17,824,585
1997	3,028,005	4,734,808	7,762,813	3,871,555	3,145,551	9,338,016	16,355,122	3,002,833	23,737,164	26,739,997
1998	2,936,062	4,588,897	7,524,960	3,478,396	3,201,607	9,077,860	15,757,809	3,254,940	28,393,640	31,648,580
1999	3,164,190	5,083,794	8,247,984	4,202,417	3,692,801	11,435,484	19,330,702	3,811,208	29,671,335	33,482,543
2000	3,466,286	5,636,849	9,103,134	5,808,459	3,594,368	10,215,354	19,618,181	3,779,132	30,351,125	34,130,256
2001	4,099,182	6,438,164	10,537,346	9,837,558	4,092,513	11,654,961	25,585,033	4,331,159	32,498,875	36,830,034
2002	4,331,553	6,603,051	10,934,605	13,353,623	4,088,156	13,159,108	30,600,887	4,057,291	32,169,231	36,226,522
2003	4,458,270	6,952,094	11,410,364	10,025,627	3,822,278	11,989,092	25,836,997	4,144,261	32,502,299	36,646,560
2004	4,998,858	7,324,591	12,323,449	8,407,999	4,224,190	11,691,460	24,323,649	4,218,243	33,052,424	37,270,667
2005	4,341,495	6,788,306	11,129,802	8,417,231	4,335,254	12,351,958	25,104,442	4,321,453	33,047,086	37,368,540
2006	4,318,400	6,374,352	10,692,752	8,476,880	4,372,607	12,587,551	25,437,038	4,200,213	32,819,065	37,019,278
2007	4,487,793	6,862,011	11,349,803	9,358,671	4,809,314	13,616,093	27,784,078	4,284,815	37,807,094	43,961,909
2008	5,258,419	6,862,658	12,121,078	10,543,165	5,193,981	14,036,176	29,773,322	4,860,449	35,229,342	40,089,791
2009	5,805,349	7,090,280	12,895,629	9,671,243	4,909,734	14,269,326	28,850,303	4,782,726	33,976,281	38,759,007
2010	6,441,117	8,840,661	15,281,779	11,132,236	5,563,835	15,845,055	32,541,125	5,350,465	36,613,306	41,963,771
2011	6,959,722	9,415,044	16,374,766	12,729,650	6,400,987	18,060,111	37,190,748	5,545,597	38,010,145	43,555,742
2012	7,504,445	9,399,893	16,904,338	13,903,722	6,511,943	20,573,568	40,989,232	5,586,752	38,374,399	43,961,150
2013	8,138,305	10,341,575	18,479,880	15,542,007	7,581,291	21,899,364	45,022,661	6,433,269	41,315,564	47,748,832
2014	<b>8,158,665</b>	<b>10,393,957</b>	<b>18,552,622</b>	<b>15,028,635</b>	<b>7,553,513</b>	<b>20,522,457</b>	<b>43,104,605</b>	<b>6,331,111</b>	<b>41,565,632</b>	<b>47,896,743</b>
2015	8,118,286	10,510,140	18,628,426	15,344,767	7,493,721	20,027,009	42,865,496	6,075,670	41,077,872	47,153,542
2016	7,927,961	10,275,348	18,203,309	14,370,696	6,987,681	18,695,338	40,053,715	6,081,690	40,847,268	46,928,958
2017	7,881,731	10,256,620	18,138,351	14,385,252	7,003,964	18,697,053	40,086,269	6,052,443	40,862,697	46,915,140
2018	7,717,401	10,190,283	17,907,684	13,860,628	6,813,092	18,078,812	38,752,532	6,074,599	40,370,933	47,345,532
2019	7,724,353	10,275,733	18,000,086	14,162,968	6,982,258	18,487,885	39,633,111	7,697,718	40,720,614	47,788,332
2020	7,693,344	10,261,787	17,955,132	13,964,695	6,888,490	18,253,434	39,106,620	7,028,028	40,564,836	47,592,864
2021	7,708,105	10,299,447	18,007,552	14,075,801	6,946,168	18,398,837	39,420,806	7,068,108	40,685,767	47,753,875
2022	7,697,186	10,306,916	18,004,102	13,891,530	6,852,770	18,173,591	38,917,891	7,024,491	40,566,045	47,590,536
2023	7,714,724	10,315,195	18,029,918	14,105,342	6,962,139	18,442,892	39,510,373	7,082,703	40,746,440	47,829,143
2024	7,706,610	10,327,247	18,033,857	14,010,736	6,914,664	18,330,799	39,256,199	7,059,309	40,686,606	47,745,915
2025	7,653,375	10,292,299	17,945,674	13,837,828	6,832,266	18,121,948	38,792,042	7,010,074	40,481,261	47,491,336
2026	7,626,942	10,281,502	17,908,444	13,946,581	6,893,805	18,262,861	39,103,247	7,040,808	40,493,775	47,534,583
2027	7,692,920	10,378,869	18,071,789	13,800,291	6,807,671	18,084,748	38,692,709	7,017,454	40,608,275	47,625,729
2028	7,575,449	10,258,822	17,834,271	13,778,990	6,816,240	18,064,072	38,659,301	7,001,230	40,290,346	47,291,576
2029	7,628,718	10,342,490	17,971,208	14,148,699	7,000,786	18,526,682	39,676,163	7,108,698	40,665,106	47,773,805
2030	7,150,446	9,790,645	16,941,091	12,869,529	6,411,668	16,951,670	36,232,867	6,741,375	38,697,444	45,438,819
2031	7,153,507	9,811,741	16,965,248	13,055,516	6,506,731	17,187,202	36,749,450	6,798,908	38,856,944	45,655,853
2032	7,158,886	9,833,394	16,992,280	13,066,560	6,511,199	17,207,288	36,785,047	6,804,086	38,918,542	45,722,627
2033	7,145,738	9,829,031	16,974,769	13,203,267	6,581,122	17,383,246	37,167,635	6,853,533	39,076,701	45,930,234
2034	7,091,672	9,795,849	16,887,522	13,106,777	6,529,102	17,267,979	36,903,857	6,833,339	39,076,069	45,909,408
2035	6,962,756	9,693,419	16,656,175	13,444,737	6,703,665	17,692,792	37,841,194	6,941,335	39,359,136	46,300,470
TOTAL	284,562,755	382,871,849	667,434,604	521,973,656	281,803,460	798,398,763	1,602,175,879	243,106,204	1,500,079,588	1,743,185,792

**TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor**

(in dollars)

Sheet 2 of 4

SAN JOAQUIN VALLEY AREA									
Calendar Year	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	2,725
1965	0	0	6,029	73,569	0	0	0	0	79,598
1966	0	0	12,039	137,330	0	0	0	0	149,368
1967	0	0	26,257	267,611	0	0	0	0	293,869
1968	225,595	19,392	54,588	445,439	1,711,094	16,947	19,694	307,738	2,800,486
1969	241,775	10,970	87,576	525,094	2,732,225	16,825	19,433	460,391	4,094,289
1970	306,958	34,405	94,675	573,998	3,882,783	21,435	30,456	522,453	5,467,163
1971	328,473	37,133	95,695	605,889	5,167,870	27,176	34,741	713,782	7,010,758
1972	382,242	40,394	98,788	631,615	7,141,351	26,473	63,931	1,988,873	10,373,667
1973	399,658	39,016	97,550	1,025,888	7,288,485	28,816	39,333	783,408	9,702,155
1974	508,536	40,230	98,460	1,143,571	8,008,633	29,545	42,640	1,044,714	10,916,328
1975	681,332	40,678	106,703	1,196,448	9,392,595	31,240	48,258	1,558,283	13,055,538
1976	720,513	43,199	108,084	1,323,177	10,639,390	32,666	52,203	1,443,433	14,362,667
1977	580,759	39,117	112,554	1,365,869	10,959,428	34,434	54,303	1,139,306	14,285,769
1978	699,379	36,029	115,521	1,564,175	13,287,689	38,927	59,122	1,173,398	16,974,240
1979	782,914	47,952	114,253	1,668,163	15,362,975	43,064	70,716	1,727,580	19,817,616
1980	963,957	49,688	125,950	1,770,264	17,019,458	48,021	95,067	1,673,832	21,746,236
1981	1,212,896	84,054	134,169	2,427,527	22,627,152	66,495	100,735	2,284,998	28,938,027
1982	1,249,012	70,247	135,057	2,516,846	25,028,291	70,662	108,386	2,279,807	31,458,308
1983	1,183,349	52,598	149,202	2,085,047	24,670,126	75,443	87,521	506,969	28,810,255
1984	1,492,917	28,580	164,505	3,352,672	33,446,499	94,321	121,533	1,542,726	40,243,754
1985	1,768,798	130,010	184,905	3,876,681	39,388,983	117,584	139,616	2,816,944	48,423,519
1986	2,010,716	79,387	180,445	4,079,837	43,466,171	136,715	153,276	3,656,157	53,762,704
1987	1,885,997	95,305	179,872	4,557,695	42,763,952	137,333	151,517	3,749,172	53,520,843
1988	1,971,053	109,683	193,735	4,704,494	44,719,371	138,279	146,681	3,903,769	55,887,579
1989	2,125,784	101,811	187,913	4,652,237	46,907,709	137,085	166,511	4,385,283	58,664,333
1990	1,884,455	87,013	221,392	4,799,306	45,689,003	121,153	148,816	3,963,498	56,914,636
1991	1,690,585	80,303	220,282	4,535,868	37,536,071	103,909	134,826	3,504,508	47,806,353
1992	2,236,424	105,122	241,455	5,540,058	48,743,276	143,783	175,809	4,543,338	61,729,266
1993	2,458,579	120,125	264,959	5,775,636	54,664,759	161,521	195,374	5,297,192	68,938,145
1994	2,263,402	107,630	306,359	5,200,567	52,114,616	145,625	178,186	4,669,892	64,986,276
1995	2,859,862	115,549	304,297	6,613,715	60,572,805	180,802	210,519	5,528,726	76,386,274
1996	2,052,304	125,238	389,203	6,666,563	58,650,211	178,474	190,131	7,094,491	75,346,615
1997	2,763,567	100,642	276,681	6,429,190	57,516,991	138,117	212,331	4,716,622	72,154,140
1998	2,609,248	119,934	381,847	5,733,156	53,999,102	143,433	203,941	4,969,922	68,160,582
1999	2,706,699	136,342	370,780	6,372,381	57,716,970	184,252	219,009	7,442,074	75,148,508
2000	2,588,957	120,630	304,418	6,097,678	51,206,827	173,813	212,997	6,151,378	66,856,698
2001	3,276,286	145,820	328,170	5,650,832	58,668,823	192,422	259,801	6,448,388	74,970,542
2002	2,986,184	127,704	320,887	6,167,757	53,516,145	187,321	238,774	5,784,116	69,328,889
2003	3,043,048	131,850	342,637	6,545,242	56,186,532	202,581	238,330	6,079,630	72,769,851
2004	3,229,941	168,432	345,113	7,860,062	56,773,900	356,070	253,849	5,835,446	74,822,813
2005	3,776,630	176,449	355,917	6,997,361	67,113,437	687,978	250,189	6,652,022	86,009,985
2006	3,590,688	166,769	296,012	7,460,213	63,975,920	532,761	254,886	5,864,430	82,141,679
2007	3,394,321	158,751	332,854	7,099,137	61,103,149	519,885	252,607	5,825,700	78,686,404
2008	3,367,147	156,518	468,523	7,733,576	61,984,081	544,835	261,044	5,523,067	80,038,790
2009	3,271,822	154,664	432,309	6,910,228	60,997,239	522,936	261,649	5,458,975	78,009,822
2010	3,669,527	238,561	506,601	8,097,471	72,885,388	656,684	330,605	6,564,070	92,948,908
2011	4,586,513	219,589	500,482	9,720,907	90,889,799	741,518	357,748	6,929,960	113,946,516
2012	3,762,018	234,863	464,435	9,850,144	85,349,742	780,533	371,362	8,035,112	108,848,209
2013	4,820,407	259,151	532,301	12,351,684	94,893,619	796,287	419,077	7,912,365	121,984,892
2014	<b>4,444,730</b>	<b>246,624</b>	<b>665,457</b>	<b>12,290,967</b>	<b>92,607,800</b>	<b>809,863</b>	<b>410,963</b>	<b>7,861,883</b>	<b>119,338,288</b>
2015	4,141,266	243,520	538,643	12,161,048	90,170,255	801,689	405,849	7,726,641	116,188,911
2016	3,916,742	231,967	583,804	11,529,505	86,384,256	765,187	386,649	7,384,251	111,182,361
2017	3,990,930	237,167	574,416	11,490,252	87,771,202	781,331	396,989	7,535,710	112,777,996
2018	3,817,055	226,111	556,468	10,933,429	84,543,722	737,556	374,712	7,187,495	108,376,547
2019	3,998,502	238,078	552,793	11,372,240	88,009,159	774,029	398,273	7,552,348	112,899,824
2020	3,666,713	233,009	555,828	11,117,890	86,522,955	757,963	387,804	7,390,880	110,633,042
2021	3,712,090	236,158	559,612	11,230,496	87,482,913	767,599	393,380	7,483,339	111,865,587
2022	3,611,934	229,527	563,934	10,928,900	85,581,375	746,923	380,292	7,280,175	109,323,059
2023	3,717,158	236,718	568,496	11,238,051	87,729,991	769,212	393,519	7,494,388	112,147,532
2024	3,661,435	233,088	573,014	11,064,787	86,640,410	757,902	386,581	7,381,627	110,698,845
2025	3,586,189	228,574	577,539	10,852,362	85,208,013	743,759	377,582	7,233,523	108,807,540
2026	3,643,523	233,014	582,410	11,021,683	86,337,973	757,443	385,959	7,355,162	110,317,167
2027	3,534,168	224,750	586,957	10,687,370	84,341,185	731,878	369,418	7,123,010	107,598,735
2028	3,560,365	228,230	589,765	10,787,731	84,817,400	742,340	375,972	7,192,856	108,294,658
2029	3,733,779	239,690	594,744	11,296,152	88,351,474	777,923	397,115	7,542,350	112,933,228
2030	3,222,548	210,555	599,803	9,878,374	78,069,508	686,581	341,858	6,556,014	99,565,240
2031	3,322,269	217,423	603,616	10,184,537	80,273,787	707,501	353,354	6,759,446	102,421,931
2032	3,298,865	215,767	609,061	10,073,536	79,637,811	702,410	351,464	6,710,269	101,599,182
2033	3,370,297	220,675	614,234	10,321,296	81,363,054	717,529	358,697	6,855,632	103,821,414
2034	3,298,075	215,640	619,180	10,059,716	79,791,501	701,794	350,213	6,706,279	101,742,398
2035	3,495,258	229,252	624,072	10,717,930	84,224,156	743,807	372,521	7,109,613	107,516,608
<b>TOTAL</b>	<b>175,355,115</b>	<b>9,843,068</b>	<b>24,269,009</b>	<b>454,018,121</b>	<b>3,774,220,540</b>	<b>26,248,397</b>	<b>15,986,695</b>	<b>339,880,829</b>	<b>4,819,821,773</b>



**TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley - East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline - Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	34,411	0	0	0	726	0	0	0	51,729	0
1964	64,494	27,447	19,542	4,370	38,211	1,143	29,757	8,205	82,811	34,987
1965	121,484	53,007	34,348	7,194	42,701	2,082	52,705	15,222	135,069	35,344
1966	221,012	101,264	62,476	12,478	76,886	3,753	94,978	27,679	232,502	61,465
1967	427,622	210,814	121,269	23,472	148,839	7,284	184,247	54,023	433,350	115,574
1968	754,401	491,396	218,649	41,509	265,168	12,870	328,476	95,466	782,163	208,927
1969	1,090,136	742,497	334,105	61,226	394,024	18,693	487,728	138,063	1,205,834	321,755
1970	1,420,639	942,559	470,423	89,700	552,223	25,231	673,925	184,837	1,778,187	467,573
1971	1,760,670	1,137,103	627,331	128,360	754,065	31,837	908,601	231,280	2,538,219	659,414
1972	2,245,384	1,382,360	819,635	179,685	1,035,804	43,430	1,236,004	287,620	3,741,482	950,297
1973	2,399,515	1,430,886	965,166	190,549	1,254,443	45,890	1,329,797	313,446	3,974,200	961,024
1974	2,520,352	1,526,467	993,985	203,642	1,298,337	48,770	1,389,635	331,702	4,448,225	1,104,491
1975	2,737,867	1,617,619	1,044,902	218,979	1,377,168	53,125	1,476,995	355,270	4,631,803	1,208,047
1976	3,199,620	1,654,373	1,103,708	231,758	1,469,992	57,620	1,553,963	381,276	4,831,375	1,278,740
1977	3,182,178	1,742,326	1,008,676	244,149	1,317,096	54,160	1,641,897	406,620	5,061,165	1,336,313
1978	3,626,133	1,875,502	1,205,609	255,071	1,613,048	56,760	1,689,749	420,026	5,090,094	1,374,033
1979	4,296,348	1,955,413	1,292,485	267,366	1,613,048	60,256	1,864,418	449,757	5,136,830	1,342,135
1980	4,994,298	2,093,907	1,406,781	295,350	1,941,392	67,604	2,038,473	499,051	5,647,604	1,485,140
1981	5,824,304	2,563,391	1,574,217	328,818	2,194,094	100,752	2,360,155	603,265	6,461,840	1,688,324
1982	5,582,860	2,726,555	1,657,630	346,721	2,336,914	82,296	2,334,053	641,991	6,752,799	1,929,664
1983	6,335,170	2,797,282	2,181,785	380,840	3,172,326	88,383	2,531,055	658,613	6,964,704	1,808,748
1984	7,713,111	3,876,095	3,287,286	497,586	4,929,764	96,492	2,797,981	727,821	8,053,209	2,598,232
1985	9,545,818	4,342,284	4,122,839	601,928	6,265,165	103,706	2,988,704	959,657	8,893,342	2,686,799
1986	9,515,134	4,977,827	4,584,188	647,633	7,009,695	130,221	3,172,782	1,223,847	9,142,822	3,398,539
1987	9,550,203	4,835,429	4,452,838	678,086	6,885,935	240,872	3,227,765	1,255,052	10,544,337	3,398,921
1988	9,149,230	5,022,288	4,510,360	704,412	7,052,631	158,845	3,402,350	1,044,206	11,095,194	3,271,137
1989	11,039,912	5,031,695	4,218,204	691,191	6,635,388	210,635	3,483,504	1,746,763	10,811,989	3,453,680
1990	12,432,751	5,499,806	4,916,383	729,229	7,720,886	331,172	3,716,237	1,953,905	11,722,947	4,221,266
1991	9,293,532	4,613,569	3,471,782	688,867	5,335,009	221,166	4,576,249	1,640,084	11,104,874	3,642,611
1992	11,850,715	5,802,258	3,626,099	612,895	5,587,382	174,998	5,554,712	1,532,325	11,144,101	3,694,099
1993	12,264,759	5,448,921	3,830,889	617,198	5,922,476	211,904	5,446,045	1,753,971	12,107,175	4,042,324
1994	14,334,329	6,015,380	3,857,907	694,421	5,963,596	278,012	6,397,494	2,090,725	12,731,705	4,776,753
1995	14,201,115	6,391,027	4,680,553	661,811	7,318,575	212,244	5,590,290	1,952,494	12,204,445	4,480,933
1996	14,628,006	6,622,171	7,634,302	710,651	12,187,480	208,357	5,688,434	2,300,206	12,730,932	4,599,073
1997	15,198,058	6,515,825	7,251,238	750,418	8,515,791	207,887	6,110,978	2,342,198	14,400,157	4,897,487
1998	13,714,014	6,138,631	6,324,675	717,140	7,018,227	209,057	7,713,809	1,946,444	14,309,132	4,177,167
1999	15,574,027	6,741,758	5,380,492	827,700	7,211,048	215,823	8,387,601	2,370,069	15,818,132	5,138,347
2000	14,749,165	10,221,484	3,773,154	793,266	5,553,536	186,880	8,270,177	2,069,118	15,541,664	4,246,042
2001	24,964,475	15,918,381	4,881,044	998,072	7,636,836	199,091	8,966,041	4,005,407	21,540,243	4,402,654
2002	16,406,306	13,152,221	4,134,635	961,617	6,405,381	182,372	8,136,338	3,394,904	22,474,649	5,806,756
2003	17,799,687	14,255,879	4,268,341	935,656	6,624,181	168,360	9,829,883	2,936,278	20,970,886	5,997,411
2004	18,977,230	15,530,026	4,951,410	1,048,329	6,747,046	202,487	10,114,417	3,222,555	25,529,918	5,500,016
2005	19,238,241	14,438,553	18,614,088	864,643	11,603,411	190,266	9,814,960	3,250,550	23,406,125	5,713,921
2006	20,973,245	13,777,268	31,851,153	857,358	11,753,559	202,447	12,680,095	3,214,829	23,375,642	5,802,434
2007	24,162,370	16,809,894	30,542,533	1,083,442	11,107,188	200,998	16,243,877	4,709,444	29,184,717	4,852,513
2008	22,101,662	19,151,737	30,322,466	1,033,866	12,196,070	217,246	14,871,588	4,691,733	29,918,477	5,941,912
2009	20,217,966	17,112,765	28,194,317	1,025,436	10,155,013	222,273	14,711,105	4,471,696	29,800,586	6,479,785
2010	24,003,187	17,623,514	38,431,828	980,955	13,654,354	228,364	17,948,697	3,987,200	33,080,023	8,236,261
2011	30,822,905	17,657,195	40,334,959	1,023,843	14,790,537	251,716	11,870,833	4,027,664	30,664,047	9,017,273
2012	31,933,790	21,214,689	48,644,877	1,153,547	17,791,013	267,309	13,831,851	6,156,013	45,812,159	9,718,856
2013	35,533,158	29,920,435	41,678,752	1,605,208	15,159,885	478,680	18,269,515	6,121,463	40,402,381	8,860,866
2014	<b>35,165,230</b>	<b>24,542,419</b>	<b>44,844,487</b>	<b>1,897,940</b>	<b>17,262,425</b>	<b>565,589</b>	<b>23,585,404</b>	<b>5,246,873</b>	<b>41,615,226</b>	<b>9,595,594</b>
2015	34,664,098	23,902,441	44,458,735	1,886,402	16,481,127	565,979	23,828,243	5,138,945	40,838,093	9,250,744
2016	32,183,435	22,559,014	43,597,408	1,787,901	15,760,935	526,806	22,942,316	4,777,967	39,317,459	8,819,257
2017	31,388,915	22,143,541	43,726,337	1,750,404	15,588,111	515,983	22,256,990	4,661,844	38,701,001	8,670,922
2018	31,461,795	20,301,516	43,903,569	1,748,622	15,591,997	516,994	23,288,124	4,678,444	38,570,678	8,636,158
2019	30,725,448	19,942,577	43,081,614	1,711,757	15,280,350	504,721	22,711,371	4,567,023	37,972,815	8,467,155
2020	30,557,786	19,743,601	42,670,468	1,691,890	15,113,008	500,906	23,075,707	4,539,250	37,486,313	8,342,248
2021	30,453,878	19,752,670	42,285,573	1,665,874	14,971,368	498,234	22,950,740	4,520,829	37,018,233	8,226,901
2022	30,112,481	19,541,292	41,285,500	1,641,266	14,716,554	492,536	22,704,185	4,470,483	36,526,406	8,099,954
2023	30,506,928	19,951,386	41,020,377	1,657,904	14,768,330	498,885	22,977,706	4,529,470	36,747,438	8,159,205
2024	30,056,902	19,741,251	40,506,106	1,634,478	14,570,313	491,617	22,633,072	4,462,552	36,361,987	8,051,200
2025	29,852,573	19,718,380	40,320,255	1,623,800	14,487,968	488,346	22,543,464	4,434,258	36,177,551	7,998,212
2026	29,747,749	19,763,844	40,131,531	1,616,203	14,410,583	486,683	22,439,868	4,420,174	36,010,545	7,948,871
2027	29,813,244	19,823,138	40,235,484	1,623,980	14,469,276	487,800	22,525,940	4,427,939	36,192,380	7,992,384
2028	29,561,499	19,738,441	40,000,592	1,607,422	14,341,597	483,766	22,358,205	4,395,703	35,864,157	7,901,805
2029	30,362,191	20,317,291	40,861,293	1,644,676	14,695,050	496,847	22,894,135	4,514,799	36,586,100	8,097,145
2030	28,068,778	18,686,142	38,690,503	1,525,928	13,701,876	459,660	21,426,576	4,190,424	34,341,116	7,486,303
2031	29,369,404	19,329,436	40,039,602	1,582,607	14,243,805	480,842	22,339,527	4,387,061	35,369,045	7,770,225
2032	27,828,981	18,739,771	38,557,343	1,517,487	13,641,816	455,846	21,263,690	4,155,326	34,296,288	7,463,384
2033	29,500,686	19,636,822	40,246,766	1,593,058	14,315,972	483,116	22,494,659	4,408,909	35,566,874	7,814,473
2034	27,827,686	18,988,038	38,714,033	1,521,473	13,692,045	455,989	21,361,807	4,159,382	34,434,359	7,491,420
2035	31,391,631	20,583,912	42,213,525	1,674,179	15,096,208	513,948	23,794,176	4,698,425	37,043,277	8,218,034
TOTAL	1,235,328,319	799,178,092	1,335,307,412	65,312,891	612,955,844	18,262,912	776,416,812	188,988,111	1,461,535,337	351,927,653

**TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	79,888
1963	0	690,812	0	777,678	0	0	0	0	12,626	1,628,026
1964	21,735	1,260,513	9,378	1,602,594	0	0	0	0	13,938	2,809,712
1965	21,866	2,180,589	17,766	2,719,376	0	0	405	405	28,337	4,814,330
1966	37,964	3,900,172	33,426	4,866,058	0	0	565	565	31,321	7,407,392
1967	71,283	7,693,703	68,155	9,559,635	0	0	562	562	47,718	13,082,894
1968	128,915	15,317,881	142,803	18,788,625	0	1,050	1,439	2,489	46,945	25,607,566
1969	198,764	23,153,064	215,209	28,361,099	0	1,225	4,120	5,345	52,963	37,012,256
1970	289,633	30,617,164	273,605	37,785,698	0	3,848	17,116	20,964	69,744	48,541,206
1971	409,327	39,958,997	342,425	49,487,630	0	4,546	19,187	23,733	55,532	61,728,170
1972	537,186	54,896,379	422,304	67,777,571	0	4,929	21,150	26,079	80,412	83,878,081
1973	587,963	59,450,695	435,655	73,339,229	0	7,059	21,778	28,837	54,219	88,739,514
1974	611,428	65,819,846	455,565	80,752,444	0	8,336	22,408	30,744	76,783	97,694,004
1975	644,621	71,630,821	478,403	87,475,618	0	9,416	23,523	32,939	84,547	106,610,379
1976	668,315	74,675,280	475,587	91,581,607	0	7,004	23,257	30,261	106,717	112,503,861
1977	696,515	73,158,031	507,063	90,356,189	0	16,917	24,059	40,976	98,618	111,150,212
1978	709,040	81,722,902	523,177	100,161,143	0	12,635	24,225	36,860	100,786	124,159,757
1979	712,866	83,375,703	526,405	103,015,576	0	16,575	28,352	44,927	119,352	130,178,238
1980	862,275	93,029,351	583,628	114,944,856	0	19,834	26,562	46,396	178,812	144,864,211
1981	946,961	112,171,493	672,540	137,490,153	0	21,682	34,563	56,245	185,347	175,434,718
1982	1,021,329	117,143,300	727,623	143,283,736	0	16,117	43,117	59,234	173,894	184,501,288
1983	1,076,279	118,991,007	854,263	147,840,455	0	15,202	29,410	44,612	220,926	186,158,596
1984	1,211,621	156,273,535	933,311	192,996,023	20,590	15,442	31,795	67,827	225,959	245,611,478
1985	1,287,789	195,493,271	993,651	238,284,952	24,050	16,976	32,405	73,431	340,322	302,039,343
1986	1,344,770	218,331,684	1,058,276	264,537,420	31,753	18,145	33,596	83,494	279,227	334,451,102
1987	1,379,613	204,859,482	1,056,318	252,364,853	37,071	17,794	33,384	88,249	345,116	324,548,378
1988	1,465,829	221,667,115	1,124,102	269,667,697	48,058	19,117	33,605	100,780	365,207	346,341,463
1989	1,505,481	230,328,277	1,232,379	280,389,097	61,184	20,809	37,188	119,181	422,329	361,239,694
1990	1,624,763	277,194,766	1,855,991	333,920,101	66,041	20,855	36,812	123,708	474,284	415,594,883
1991	1,720,878	221,887,061	1,549,955	269,745,636	180,212	22,526	42,200	244,938	214,683	339,705,012
1992	1,779,902	245,365,618	1,503,480	298,228,585	208,216	26,028	43,517	277,761	443,676	384,746,429
1993	1,943,336	219,238,180	1,551,253	274,378,432	209,613	26,203	47,588	283,404	599,571	370,718,087
1994	1,920,217	257,365,883	1,475,069	317,901,492	201,284	25,161	46,079	272,524	609,966	412,825,870
1995	1,982,808	225,863,369	1,568,401	287,108,063	216,945	27,118	50,022	294,085	534,971	395,277,551
1996	1,651,239	235,410,311	1,622,641	305,993,805	217,250	27,155	56,622	301,027	571,857	424,033,118
1997	1,758,607	245,453,566	1,777,266	315,179,475	236,300	29,847	59,915	326,062	428,638	438,946,246
1998	1,947,195	227,090,227	1,796,534	293,102,252	128,021	29,927	36,222	194,170	465,095	416,853,448
1999	2,270,988	256,781,238	1,882,059	328,599,280	254,675	31,834	40,585	327,904	587,326	465,723,438
2000	2,547,590	251,414,783	1,964,491	321,331,350	262,163	79,001	43,704	384,868	0	451,424,487
2001	3,486,527	443,861,254	2,264,348	543,124,375	261,699	93,471	45,056	400,226	0	691,447,556
2002	4,836,283	333,694,954	2,305,932	421,892,347	266,107	95,018	47,297	408,422	0	569,391,671
2003	6,134,749	363,075,813	2,332,080	455,349,203	262,547	93,638	68,957	425,142	0	602,438,116
2004	6,486,295	414,408,561	2,618,751	515,347,041	284,387	102,404	29,286	416,077	0	664,503,696
2005	6,763,810	384,313,088	2,084,073	500,295,728	280,033	727,066	28,810	1,035,909	0	660,944,406
2006	7,277,271	361,317,114	2,053,784	495,136,198	292,991	43,185	38,579	374,755	0	650,801,700
2007	7,905,491	439,824,122	2,539,666	589,166,254	291,100	40,957	46,246	378,303	0	745,256,752
2008	9,653,748	414,072,466	3,008,895	567,181,866	306,916	804,536	86,666	1,198,118	0	730,402,964
2009	9,767,969	381,499,807	2,870,784	526,529,500	328,896	855,550	90,621	1,275,367	0	686,319,628
2010	10,984,011	443,844,860	3,056,646	616,059,900	400,358	1,064,565	108,862	1,573,785	0	800,369,268
2011	11,809,068	492,970,590	3,129,298	668,369,928	451,483	1,197,315	121,974	1,770,772	0	881,208,471
2012	13,137,226	520,279,034	3,553,255	733,493,619	460,139	1,318,107	130,899	1,909,144	0	946,105,693
2013	14,901,304	562,203,184	3,661,697	778,795,727	509,721	1,460,139	150,472	2,120,332	0	1,014,152,325
2014	<b>14,366,741</b>	<b>541,874,249</b>	<b>5,075,771</b>	<b>765,637,947</b>	<b>500,727</b>	<b>1,434,375</b>	<b>150,953</b>	<b>2,086,055</b>	0	<b>996,616,261</b>
2015	14,365,521	525,357,781	5,058,556	745,796,664	497,417	1,424,893	157,033	2,079,343	0	972,712,383
2016	13,957,171	499,110,550	4,738,650	710,078,868	498,009	1,426,588	161,411	2,086,008	0	928,533,219
2017	13,862,824	490,163,293	4,650,151	698,080,314	497,085	1,423,941	161,076	2,082,102	0	918,080,172
2018	13,833,932	489,223,251	4,137,344	695,892,423	489,665	1,402,687	158,350	2,050,702	0	910,325,420
2019	13,743,487	478,700,300	4,044,416	681,453,034	493,379	1,413,326	157,087	2,063,792	0	901,833,780
2020	13,678,673	472,788,611	3,997,165	674,185,626	489,338	1,401,749	143,673	2,034,760	0	891,508,043
2021	13,624,076	468,447,834	3,962,887	668,379,098	489,053	1,400,933	142,744	2,032,730	0	887,459,648
2022	13,557,420	459,801,134	3,898,743	656,847,955	486,692	1,394,168	140,492	2,021,352	0	872,704,694
2023	13,600,700	464,440,138	3,947,745	662,806,213	487,110	1,395,366	140,644	2,023,120	0	882,346,298
2024	13,544,921	456,187,539	3,880,239	652,122,178	485,264	1,390,078	139,967	2,015,309	0	869,872,304
2025	13,517,349	452,970,045	3,855,256	647,987,457	480,106	1,375,302	138,070	1,993,478	0	863,017,528
2026	13,500,930	450,618,583	3,839,833	644,935,395	476,520	1,365,031	136,753	1,978,304	0	861,777,140
2027	13,542,046	452,058,102	3,851,114	647,042,829	481,217	1,378,486	138,476	1,998,179	0	861,029,970
2028	13,499,207	446,772,580	3,805,529	640,330,503	469,140	1,343,890	134,040	1,947,070	0	854,357,380
2029	13,630,847	457,903,444	3,889,068	655,892,886	472,751	1,354,233	135,364	1,962,348	0	876,209,637
2030	13,271,935	418,552,799	3,551,345	603,953,385	428,118	1,226,778	118,977	1,773,473	0	803,904,875
2031	13,456,370	433,030,933	3,644,974	625,043,830	428,118	1,226,377	118,976	1,773,471	0	828,609,783
2032	13,286,544	414,422,157	3,505,191	599,133,824	428,118	1,226,378	118,975	1,773,471	0	802,006,432
2033	13,511,765	434,340,833	3,652,242	627,565,995	428,124	1,226,394	118,977	1,773,495	0	833,233,540
2034	13,332,031	415,469,731	3,509,271	600,957,266	428,124	1,226,393	118,977	1,773,494	0	804,173,946
2035	13,783,114	455,303,758	3,790,268	658,104,456	428,122	1,226,390	118,974	1,773,486	0	868,192,391
TOTAL	453,218,250	20,753,758,559	156,475,124	28,208,665,315	17,162,000	38,199,920	5,114,752	60,476,671	8,751,580	37,110,511,614

**TABLE B-24 Equivalent Unit Charge for Water Supply for Each Contractor<sup>a</sup>**

(in dollars per acre-foot)

Project Service Area and Water Supply Contractor	Transportation Charge					Delta Water Charge	Water System Revenue Bond Surcharge	Total Equivalent Unit Charge
	Capital Cost Component	Minimum OMP&R Component	Off-Aqueduct Component	Variable OMP&R Component	Total			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
<b>FEATHER RIVER AREA</b>								
City of Yuba City	0.00	0.00	0.00	0.00	0.00	112.96	12.58	125.55
County of Butte	0.00	0.00	0.00	0.00	0.00	372.37	36.58	408.96
Plumas County Flood Control and Water Conservation District	35.51	3.89	0.00	0.00	39.40	57.76	8.29	105.45
Feather River Area	8.27	0.91	0.00	0.00	9.18	167.84	17.85	194.87
<b>NORTH BAY AREA</b>								
Napa County Flood Control and Water Conservation District	173.40	67.59	4.83	17.03	262.85	34.93	15.71	313.49
Solano County Water Agency	103.91	66.86	5.29	10.10	186.15	41.64	12.73	240.53
North Bay Area	129.99	67.13	5.12	12.70	214.95	39.12	13.85	267.92
<b>SOUTH BAY AREA</b>								
Alameda County Flood Control and Water Conservation District, Zone 7	49.92	51.82	9.16	21.13	132.03	38.70	8.99	179.71
Alameda County Water District	30.05	31.64	7.48	13.83	83.00	28.07	4.81	115.88
Santa Clara Valley Water District	24.68	22.39	6.66	11.08	64.82	18.61	3.30	86.72
South Bay Area	29.76	28.80	7.21	13.21	78.98	23.50	4.49	106.97
<b>SAN JOAQUIN VALLEY AREA</b>								
County of Kings	6.13	8.57	3.78	8.05	26.53	30.98	3.67	61.18
Dudley Ridge Water District	5.43	5.72	3.37	4.79	19.31	19.10	2.19	40.59
Empire West Side Irrigation District	2.18	5.22	2.54	4.54	14.48	21.25	1.74	37.47
Kern County Water Agency	9.72	11.29	5.13	6.81	32.96	23.41	2.79	59.16
Oak Flat Water District	2.19	2.80	2.03	3.05	10.07	19.88	1.75	31.70
Tulare Lake Basin Water Storage District	5.54	5.76	3.25	4.74	19.29	19.76	2.18	41.23
San Joaquin Valley Area	8.99	10.36	4.81	6.47	30.63	22.82	2.69	56.14
<b>CENTRAL COASTAL AREA</b>								
San Luis Obispo County Flood Control and Water Conservation District	432.95	280.51	14.81	113.47	841.74	184.88	50.18	1,076.79
Santa Barbara County Flood Control and Water Conservation District	1110.84	271.88	20.91	99.84	1,503.47	89.56	74.77	1,667.80
Central Coastal Area	969.95	273.67	19.64	102.68	1,365.94	109.37	69.66	1,544.97
<b>SOUTHERN CALIFORNIA AREA</b>								
Antelope Valley-East Kern Water Agency	55.96	54.61	32.99	68.11	211.66	47.65	9.32	268.64
Castaic Lake Water Agency	60.10	59.07	25.88	40.84	185.89	41.50	12.14	239.53
Coachella Valley Water District	81.17	84.91	43.85	75.89	285.81	41.36	10.68	337.85
Crestline-Lake Arrowhead Water Agency	155.42	142.86	34.43	81.49	414.20	70.27	19.40	503.87
Desert Water Agency	52.37	53.12	52.55	44.05	202.10	28.29	7.04	237.42
Littlerock Creek Irrigation District	91.09	89.35	29.98	70.07	280.48	75.99	14.59	371.06
Mojave Water Agency	151.22	174.16	29.42	142.09	496.89	109.63	26.84	633.35
Palmdale Water District	64.88	67.31	44.00	93.01	269.21	62.46	11.10	342.77
San Bernardino Valley Municipal Water District	250.09	197.14	31.13	77.99	556.35	82.08	24.04	662.46
San Gabriel Valley Municipal Water District	120.34	112.86	47.81	49.80	330.81	52.06	14.58	397.45
San Geronio Pass Water Agency	1185.67	544.41	36.42	227.22	1,993.71	131.09	40.00	2,164.80
The Metropolitan Water District of Southern California	89.91	73.09	39.50	44.13	246.63	43.35	11.35	301.33
Ventura County Watershed Protection District	300.15	248.01	24.48	121.63	694.27	156.97	41.99	893.23
Southern California Area	92.88	77.14	38.99	48.90	257.91	45.27	11.75	314.93
<b>ALL AREAS</b>	<b>54.17</b>	<b>43.92</b>	<b>20.63</b>	<b>26.79</b>	<b>145.52</b>	<b>33.79</b>	<b>7.37</b>	<b>186.68</b>

(a) Hypothetical charges, which, if assessed on all Table A water delivered to date, all surplus water delivered prior to May 1, 1973, and all Table A water estimated to be delivered during the remainder of the project repayment period (Table B-5B), would provide a sum at the end of the period financially equivalent to all Transportation Charge and Delta Water Charge payments required under a water supply contract, considering interest at the Project Interest Rate, 4.610 percent per annum.

**TABLE B-25 Equivalent Unit Transportation Costs of Water Delivered from or through Each Aqueduct Reach<sup>a</sup>**

(in dollars per acre-foot)

Aqueduct Reach	Unit Costs of Reach (b)						Cumulative Unit Costs from the Delta					
	Capital Costs	Water System Revenue Bond Surcharge (c)	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total	Capital Costs	Water System Revenue Bond Surcharge (c)	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
<b>NBA</b>												
1	44.63	16.77	16.03	2.46	1.44	81.33	44.63	16.77	16.03	2.46	1.44	81.33
2	47.50	17.85	7.01	0.00	0.00	72.36	92.13	34.62	23.04	2.46	1.44	153.69
3A	8.47	3.18	13.93	5.07	2.33	32.98	100.60	37.80	36.97	7.53	3.77	186.67
3B	54.46	20.47	31.50	3.73	5.17	115.33	146.59	55.09	54.54	6.19	6.61	269.02
<b>SBA</b>												
1	7.80	2.93	18.79	5.56	5.39	40.47	9.98	3.75	22.49	8.28	7.91	52.41
2	0.73	0.27	2.12	0.00	0.00	3.12	10.71	4.02	24.61	8.28	7.91	55.53
4	2.45	0.92	3.62	0.00	0.00	6.99	13.16	4.94	28.23	8.28	7.91	62.52
5	5.15	1.94	2.84	0.00	0.00	9.93	18.31	6.88	31.07	8.28	7.91	72.45
6	0.30	0.11	0.30	0.00	0.00	0.71	18.61	6.99	31.37	8.28	7.91	73.16
7	2.28	0.86	0.55	0.00	0.00	3.69	20.89	7.85	31.92	8.28	7.91	76.85
8	3.10	1.16	0.91	0.00	0.00	5.17	23.99	9.01	32.83	8.28	7.91	82.02
9	6.40	2.41	3.41	0.00	0.00	12.22	30.39	11.42	36.24	8.28	7.91	94.24
<b>CA</b>												
1	2.18	0.82	3.70	2.72	2.52	11.94	2.18	0.82	3.70	2.72	2.52	11.94
2A	1.39	0.52	0.73	0.00	0.00	2.64	3.57	1.34	4.43	2.72	2.52	14.58
2B	0.71	0.27	0.36	0.00	0.00	1.34	4.28	1.61	4.79	2.72	2.52	15.92
3	0.62	0.23	0.27	0.00	0.00	1.12	4.90	1.84	5.06	2.72	2.52	17.04
4	0.99	0.37	1.84	1.29	1.14	5.63	5.89	2.21	6.90	4.01	3.66	22.67
5	0.76	0.29	0.36	0.00	0.00	1.41	6.65	2.50	7.26	4.01	3.66	24.08
6	0.20	0.08	0.18	0.00	0.00	0.46	6.85	2.58	7.44	4.01	3.66	24.54
7	1.14	0.43	0.44	0.00	0.00	2.01	7.99	3.01	7.88	4.01	3.66	26.55
8C	0.02	0.01	0.08	0.00	0.00	0.11	8.01	3.02	7.96	4.01	3.66	26.66
8D	0.44	0.17	0.35	0.00	0.00	0.96	8.45	3.19	8.31	4.01	3.66	27.62
9	0.37	0.14	0.33	0.00	0.00	0.84	8.82	3.33	8.64	4.01	3.66	28.46
10A	0.39	0.15	0.43	0.00	0.00	0.97	9.21	3.48	9.07	4.01	3.66	29.43
11B	0.57	0.21	0.27	0.00	0.00	1.05	9.78	3.69	9.34	4.01	3.66	30.48
12D	0.54	0.20	0.25	0.00	0.00	0.99	10.32	3.89	9.59	4.01	3.66	31.47
12E	0.38	0.14	0.42	0.00	0.00	0.94	10.70	4.03	10.01	4.01	3.66	32.41
13B	0.81	0.30	0.48	0.00	0.00	1.59	11.51	4.33	10.49	4.01	3.66	34.00
14A	3.14	1.18	3.71	2.28	2.15	12.46	14.65	5.51	14.20	6.29	5.81	46.46
14B	0.49	0.18	0.46	0.00	0.00	1.13	15.14	5.69	14.66	6.29	5.81	47.59
14C	0.41	0.15	0.34	0.00	0.00	0.90	15.55	5.84	15.00	6.29	5.81	48.49
15A	2.33	0.88	3.87	2.78	2.33	12.19	17.88	6.72	18.87	9.07	8.14	60.68
16A	3.85	1.45	5.99	6.02	5.44	22.75	21.73	8.17	24.86	15.09	13.58	83.43
17E	13.01	4.89	16.82	21.07	20.07	75.86	34.74	13.06	41.68	36.16	33.65	159.29
17F	3.37	1.27	0.21	0.00	0.00	4.85	38.11	14.33	41.89	36.16	33.65	164.14
18A	3.03	1.14	2.02	0.00	-2.11	4.08	41.14	15.47	43.91	36.16	31.54	168.22
19	2.24	0.84	1.22	0.00	0.00	4.30	43.38	16.31	45.13	36.16	31.54	172.52
19C	2.43	0.91	0.00	0.00	0.00	3.34	45.81	17.22	45.13	36.16	31.54	175.86
20A	1.78	0.67	2.02	0.00	0.00	4.47	47.59	17.89	47.15	36.16	31.54	180.33
20B	2.16	0.81	1.33	0.00	0.00	4.30	49.75	18.70	48.48	0.00	31.54	148.47
21	1.09	0.41	0.92	0.00	0.00	2.42	50.84	19.11	49.40	0.00	31.54	150.89
22A	1.14	0.43	0.48	0.00	0.00	2.05	51.98	19.54	49.88	0.00	31.54	152.94
22B	11.15	4.19	13.02	6.40	6.62	41.38	63.13	23.73	62.90	6.40	38.16	194.32
23	3.06	1.15	0.90	0.00	-2.69	2.42	66.19	24.88	63.80	6.40	35.47	196.74
24	5.94	2.23	2.53	0.00	0.00	10.70	72.13	27.11	66.33	6.40	35.47	207.44
25	4.34	1.63	0.14	0.00	0.00	6.11	76.47	28.74	66.47	6.40	35.47	213.55
26A	4.74	1.78	8.44	0.00	-18.36	(3.40)	81.21	30.52	74.91	6.40	17.11	210.15
28G	8.82	3.31	3.19	0.00	0.00	15.32	90.03	33.83	78.10	6.40	17.11	225.47
28H	8.49	3.19	3.35	0.00	0.00	15.03	98.52	37.02	81.45	6.40	17.11	240.50
28J	95.22	35.78	46.53	0.00	0.00	177.53	193.74	72.80	127.98	6.40	17.11	418.03
<b>EBX</b>												
1	N/A	0.00	0.31	0.00	0.00	0.31	N/A	30.52	75.22	6.40	17.11	129.25
2A	N/A	0.00	1.35	0.00	0.00	1.35	N/A	30.52	76.57	6.40	17.11	130.60
2B	N/A	0.00	62.67	7.52	29.64	99.83	N/A	30.52	139.24	13.92	46.75	230.43
2C	N/A	0.00	0.76	0.00	0.00	0.76	N/A	30.52	140.00	13.92	46.75	231.19
2D	N/A	0.00	0.00	0.00	0.00	0.00	N/A	30.52	140.00	13.92	46.75	231.19
2E	N/A	0.00	0.00	0.00	0.00	0.00	N/A	30.52	140.00	13.92	46.75	231.19
3A	N/A	0.00	102.03	9.01	38.87	149.91	N/A	30.52	242.03	22.93	85.62	381.10
3B	N/A	0.00	2.12	0.00	0.00	2.12	N/A	30.52	244.15	22.93	85.62	383.22
4A	N/A	0.00	10.43	0.00	0.00	10.43	N/A	30.52	254.57	22.93	85.62	393.65
4B	N/A	0.00	44.82	1.05	2.65	48.52	N/A	30.52	299.39	23.98	88.27	442.16
<b>WB</b>												
29A	4.42	1.66	9.66	2.76	2.36	20.86	42.53	15.99	51.55	38.92	36.01	185.00
29F	3.22	1.21	1.16	0.00	0.00	5.59	45.75	17.20	52.71	38.92	36.01	190.59
29G	10.70	4.02	5.50	0.00	-8.49	11.73	56.45	21.22	58.21	38.92	27.52	202.32
29H	6.66	2.50	5.21	0.00	0.00	14.37	63.11	23.72	63.42	38.92	27.52	216.69
29J	11.17	4.20	1.50	0.00	-15.87	1.00	74.28	27.92	64.92	38.92	11.65	217.69
30	17.93	6.74	4.67	0.00	0.00	29.34	92.21	34.66	69.59	38.92	11.65	247.03
<b>CB</b>												
31A	8.11	3.05	22.06	2.09	2.03	37.34	16.56	6.24	30.37	6.10	5.69	64.96
33A	303.03	113.87	41.61	14.67	26.51	499.69	319.59	120.11	71.98	20.77	32.20	564.65
34	216.51	81.36	1.16	0.00	0.00	299.03	536.10	201.47	73.14	20.77	32.20	863.68
35	0.00	0.00	0.00	0.00	0.00	0.00	536.10	201.47	73.14	20.77	32.20	863.68

(a) Representative of transportation unit costs only; does not include a unit cost of conservation. The Delta Water Rate should be added to these values in order to approximate unit costs at canalside.

Includes surplus water prior to May 1, 1973.

(b) Hypothetical charges which, if assessed on all Table A water delivered to date, all surplus water delivered prior to May 1, 1973, and all Table A water estimated to be delivered during the remainder of the Project repayment period (Table B-5B), would provide a sum at the end of the period financially equivalent to all Transportation Charges required under the water supply contract considering interest rate at the Project Interest Rate of 4.610 percent per annum.

(c) The Water System Revenue Bond Surcharge equivalent unit rate is calculated by multiplying Column 1 by the ratio of the 2014 WSRB surcharge to the sum of the Transportation Capital and the Capital component of the Delta Water Charge.

**TABLE B-26 Capital Costs of Each Aqueduct Reach  
to be Reimbursed through the Capital Cost Component  
of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 1 of 2

Calendar Year	CALIFORNIA AQUEDUCT							
	MOJAVE DIVISION							
	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23B
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1952	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	117,000	0	0	0	0	0	0	0
1980	200,000	0	0	0	0	0	0	74,000
1981	135,000	0	0	0	0	0	0	385,000
1982	1,503,000	0	0	0	0	0	0	1,586,000
1983	2,260,000	0	0	0	0	0	0	2,965,000
1984	735,000	0	0	0	0	0	796,000	1,380,000
1985	93,000	435,000	75,000	544,000	859,000	703,000	970,000	146,000
1986	784,000	4,477,000	3,144,000	2,234,000	1,569,000	1,203,000	1,808,000	34,000
1987	11,000	951,000	1,076,000	666,000	399,000	47,000	16,421,000	43,000
1988	1,000	125,000	1,681,000	1,730,000	2,024,000	40,000	13,326,000	70,000
1989	0	206,000	2,089,000	2,174,000	2,510,000	61,000	11,242,000	229,000
1990	1,000	577,000	903,000	735,000	928,000	194,000	20,131,000	887,000
1991	1,000	280,000	413,000	333,000	422,000	93,000	20,702,000	1,215,000
1992	0	40,000	41,000	39,000	35,000	13,000	9,599,000	3,719,000
1993	0	19,000	16,000	19,000	12,000	6,000	2,319,000	19,654,000
1994	0	2,000	3,000	2,000	4,000	3,000	803,000	3,173,000
1995	0	0	0	0	0	0	223,000	1,465,000
1996	0	0	0	0	0	0	6,014,000	478,000
1997	0	0	0	0	0	0	404,000	1,327,000
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>5,841,000</b>	<b>7,112,000</b>	<b>9,441,000</b>	<b>8,476,000</b>	<b>8,762,000</b>	<b>2,363,000</b>	<b>104,758,000</b>	<b>38,830,000</b>



**TABLE B-26 Capital Costs of Each Aqueduct Reach  
to be Reimbursed through the Capital Cost Component  
of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							GRAND TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Total	Reach 25	Reach 26A	Reach 26B	Total	
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
1952	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	117,000	0	0	0	0	117,000
1980	0	0	274,000	0	0	0	0	274,000
1981	0	0	520,000	0	0	0	0	520,000
1982	0	0	3,089,000	0	0	0	0	3,089,000
1983	0	0	5,225,000	0	0	0	0	5,225,000
1984	0	0	2,911,000	0	0	0	0	2,911,000
1985	0	0	3,825,000	0	528,000	89,000	617,000	4,442,000
1986	25,000	0	15,278,000	0	1,926,000	154,000	2,080,000	17,358,000
1987	178,000	0	19,792,000	0	3,699,000	437,000	4,136,000	23,928,000
1988	632,000	0	19,629,000	0	5,667,000	3,329,000	8,996,000	28,625,000
1989	1,130,000	0	19,641,000	0	40,879,000	1,650,000	42,529,000	62,170,000
1990	2,066,000	0	26,422,000	0	29,853,000	1,650,000	31,503,000	57,925,000
1991	4,980,000	0	28,439,000	0	26,027,000	999,000	27,026,000	55,465,000
1992	11,920,000	0	25,406,000	0	15,317,000	299,000	15,616,000	41,022,000
1993	16,303,000	0	38,348,000	0	4,878,000	0	4,878,000	43,226,000
1994	7,081,000	0	11,071,000	0	3,151,000	0	3,151,000	14,222,000
1995	5,350,000	0	7,038,000	0	2,137,000	0	2,137,000	9,175,000
1996	1,706,000	0	8,198,000	0	9,181,000	0	9,181,000	17,379,000
1997	1,905,000	0	3,636,000	0	175,000	0	175,000	3,811,000
1998	28,000	0	28,000	0	0	0	0	28,000
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>53,304,000</b>	<b>0</b>	<b>238,887,000</b>	<b>0</b>	<b>143,418,000</b>	<b>8,607,000</b>	<b>152,025,000</b>	<b>390,912,000</b>

**TABLE B-27 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 1 of 2

Calendar Year	CALIFORNIA AQUEDUCT							
	MOJAVE DIVISION							
	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23B
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	1,048,625	0
1995	0	0	0	0	0	0	953,814	0
1996	0	0	0	0	0	0	1,171,411	0
1997	0	0	0	0	0	0	1,110,038	0
1998	0	0	0	0	0	0	1,213,002	0
1999	1,229	517	646	409	383	169	668,466	0
2000	4,452	1,875	2,340	1,484	1,386	614	1,339,181	0
2001	347	146	183	116	108	48	1,048,068	0
2002	1,639	690	861	546	510	226	1,537,631	0
2003	0	0	0	0	0	0	1,838,208	0
2004	2,132	27,868	18,579	18,731	10,355	8,528	1,503,239	0
2005	1,243	16,250	10,833	10,922	6,038	4,973	1,039,312	0
2006	4,632	60,550	40,367	40,697	22,499	18,529	1,501,047	0
2007	13,123	171,531	114,354	115,291	63,738	52,490	1,773,810	0
2008	28,340	370,451	246,967	248,992	137,654	113,362	2,879,469	0
2009	37,593	491,395	327,597	330,282	182,595	150,372	2,833,622	0
2010	8,932	116,755	77,837	78,475	43,385	35,728	2,013,839	0
2011	6,959	90,964	60,643	61,140	33,801	27,836	2,043,520	0
2012	11,090	144,958	96,639	97,431	53,864	44,359	2,218,618	0
2013	0	0	0	0	0	0	2,383,567	0
2014	0	0	0	0	0	0	2,327,586	0
2015	0	0	0	0	0	0	2,088,673	0
2016	0	0	0	0	0	0	2,088,673	0
2017	0	0	0	0	0	0	2,088,673	0
2018	0	0	0	0	0	0	2,088,673	0
2019	0	0	0	0	0	0	2,088,673	0
2020	0	0	0	0	0	0	2,088,673	0
2021	0	0	0	0	0	0	2,088,673	0
2022	0	0	0	0	0	0	2,088,673	0
2023	0	0	0	0	0	0	2,088,673	0
2024	0	0	0	0	0	0	2,088,673	0
2025	0	0	0	0	0	0	2,088,673	0
2026	0	0	0	0	0	0	2,088,673	0
2027	0	0	0	0	0	0	2,088,673	0
2028	0	0	0	0	0	0	2,088,673	0
2029	0	0	0	0	0	0	2,088,673	0
2030	0	0	0	0	0	0	2,088,673	0
2031	0	0	0	0	0	0	2,088,673	0
2032	0	0	0	0	0	0	2,088,673	0
2033	0	0	0	0	0	0	2,088,673	0
2034	0	0	0	0	0	0	2,088,673	0
2035	0	0	0	0	0	0	2,088,673	0
<b>TOTAL</b>	<b>121,711</b>	<b>1,493,952</b>	<b>997,845</b>	<b>1,004,516</b>	<b>556,317</b>	<b>457,235</b>	<b>78,308,206</b>	<b>0</b>

**TABLE B-27 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Subtotal	Reach 25	Reach 26A (a)	Reach 26B	Subtotal	
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	1,048,625	0	1,713,260	0	1,713,260	2,761,885
1995	0	0	953,814	0	1,452,549	0	1,452,549	2,406,363
1996	0	0	1,171,411	0	1,350,581	0	1,350,581	2,521,992
1997	679,826	0	1,789,864	0	1,528,509	0	1,528,509	3,318,373
1998	825,038	0	2,038,040	0	1,619,068	0	1,619,068	3,657,108
1999	382,178	0	1,053,997	0	956,229	0	956,229	2,010,227
2000	736,527	0	2,087,860	0	1,423,495	0	1,423,495	3,511,354
2001	812,638	0	1,861,654	0	814,902	0	814,902	2,676,556
2002	728,857	0	2,270,960	0	1,138,792	0	1,138,792	3,409,752
2003	915,968	0	2,754,176	0	1,278,532	0	1,278,532	4,032,708
2004	933,016	0	2,522,448	0	1,853,926	0	1,853,926	4,376,374
2005	1,042,062	0	2,131,634	0	1,865,975	0	1,865,975	3,997,609
2006	831,296	0	2,519,617	0	1,727,576	0	1,727,576	4,247,193
2007	1,289,180	0	3,593,518	0	2,708,172	0	2,708,172	6,301,689
2008	1,053,044	0	5,078,279	0	2,655,841	0	2,655,841	7,734,120
2009	1,505,688	0	5,859,144	0	2,751,951	0	2,751,951	8,611,096
2010	1,428,415	0	3,803,367	0	2,329,413	0	2,329,413	6,132,780
2011	1,777,020	0	4,101,883	0	2,033,564	0	2,033,564	6,135,447
2012	1,260,655	0	3,927,613	0	2,268,512	0	2,268,512	6,196,125
2013	1,629,800	0	4,013,367	0	2,626,672	0	2,626,672	6,640,039
<b>2014</b>	<b>1,646,232</b>	<b>0</b>	<b>3,973,818</b>	<b>0</b>	<b>3,253,086</b>	<b>0</b>	<b>3,253,086</b>	<b>7,226,904</b>
2015	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2016	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2017	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2018	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2019	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2020	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2021	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2022	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2023	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2024	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2025	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2026	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2027	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2028	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2029	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2030	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2031	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2032	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2033	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2034	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
2035	1,645,720	0	3,734,393	0	2,638,831	0	2,638,831	6,373,224
<b>TOTAL</b>	<b>54,037,560</b>	<b>0</b>	<b>136,977,343</b>	<b>0</b>	<b>94,766,055</b>	<b>0</b>	<b>94,766,055</b>	<b>231,743,398</b>

(a) Units 3 and 4 at Devil Canyon Powerplant were operational in 1993.

**TABLE B-28 Capital Costs of East Branch Enlargement  
Transportation Facilities Allocated to Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley- East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	11,731	1,010	10,566	466	0	93,227	117,000
1980	0	28,241	4,708	27,495	797	0	212,759	274,000
1981	0	56,134	16,676	61,271	538	0	385,381	520,000
1982	0	326,180	76,872	337,913	5,988	0	2,342,047	3,089,000
1983	0	554,658	138,964	582,070	9,004	0	3,940,304	5,225,000
1984	0	306,514	68,842	314,468	2,928	0	2,218,248	2,911,000
1985	49,675	447,266	65,773	347,262	4,514	21,614	3,505,896	4,442,000
1986	185,353	1,757,633	236,324	1,363,586	41,900	78,842	13,694,362	17,358,000
1987	49,735	2,455,279	378,535	1,774,447	10,615	151,421	19,107,968	23,928,000
1988	124,534	2,689,959	500,466	1,712,431	13,783	231,982	23,351,845	28,625,000
1989	155,446	7,118,094	2,423,000	1,671,088	17,419	1,673,409	49,111,544	62,170,000
1990	62,786	6,459,229	1,943,918	2,234,452	8,680	1,222,053	45,993,882	57,925,000
1991	28,686	6,265,822	1,875,066	2,168,712	4,024	1,065,433	44,057,257	55,465,000
1992	2,911	4,826,764	1,610,921	1,359,335	471	627,012	32,594,586	41,022,000
1993	1,205	5,094,237	1,828,410	2,722,156	212	199,684	33,380,096	43,226,000
1994	273	1,726,376	631,816	478,543	27	128,988	11,255,977	14,222,000
1995	0	1,130,963	423,243	206,978	0	87,480	7,326,336	9,175,000
1996	0	2,025,987	645,296	606,205	0	375,830	13,725,682	17,379,000
1997	0	451,011	154,366	205,796	0	7,164	2,992,663	3,811,000
1998	0	3,551	1,293	0	0	0	23,156	28,000
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
TOTAL	660,604	43,735,629	13,025,499	18,184,774	121,366	5,870,912	309,313,216	390,912,000

**TABLE B-29 Capital Cost Component of East Branch Enlargement  
Facilities Transportation Charge for Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley - East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District (a)	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	18,266	1,209,293	360,156	502,810	3,356	0	8,552,529	10,646,410
1989	19,176	1,269,524	378,094	527,854	3,523	0	8,978,504	11,176,675
1990	19,186	1,270,244	378,308	528,153	3,525	0	8,983,597	11,183,013
1991	19,187	1,270,261	378,314	528,160	3,525	0	8,983,717	11,183,164
1992	38,420	2,543,616	757,549	1,057,606	7,059	0	17,989,315	22,393,565
1993	40,029	2,650,139	789,274	1,101,897	7,354	0	18,742,682	23,331,375
1994	39,705	2,628,706	782,890	1,092,986	7,295	0	18,591,099	23,142,681
1995	39,632	2,623,828	781,438	1,090,958	7,281	0	18,556,603	23,099,740
1996	39,825	2,636,667	785,261	1,096,296	7,317	0	18,647,406	23,212,772
1997	41,743	2,763,629	823,074	1,149,085	7,669	0	19,545,322	24,330,522
1998	42,642	2,823,126	840,793	1,173,824	7,834	0	19,966,107	24,854,326
1999	44,738	2,961,887	882,120	1,231,519	8,219	0	20,947,475	26,075,958
2000	49,031	3,246,109	966,768	1,349,695	9,008	0	22,957,586	28,578,197
2001	49,048	3,247,263	967,111	1,350,175	9,011	0	22,965,748	28,588,356
2002	47,894	3,170,848	944,353	1,318,402	8,799	0	22,425,318	27,915,614
2003	40,765	2,698,871	803,787	1,122,160	7,489	0	19,087,337	23,760,409
2004	44,199	2,926,222	871,498	1,216,690	8,120	0	20,695,237	25,761,966
2005	33,144	2,194,299	653,514	912,364	6,089	0	15,518,826	19,318,236
2006	46,979	3,110,276	926,313	1,293,217	8,631	0	21,996,926	27,382,342
2007	45,289	2,998,370	892,985	1,246,688	8,321	0	21,205,488	26,397,141
2008	42,491	2,813,118	837,813	1,169,662	7,806	0	19,895,328	24,766,218
2009	43,670	2,891,182	861,062	1,202,121	8,023	0	20,447,424	25,453,482
2010	44,839	2,968,619	884,125	1,234,318	8,238	0	20,995,084	26,135,223
2011	43,190	2,859,419	851,602	1,188,914	7,935	0	20,222,785	25,173,845
2012	43,704	2,893,449	861,737	1,203,063	8,029	0	20,463,459	25,473,441
2013	55,360	3,739,010	1,123,331	1,523,928	10,171	0	26,380,425	32,832,225
2014	<b>58,891</b>	<b>3,966,057</b>	<b>1,190,060</b>	<b>1,621,132</b>	<b>10,820</b>	<b>0</b>	<b>27,991,931</b>	<b>34,838,891</b>
2015	63,827	4,297,808	1,289,527	1,756,983	11,726	0	30,333,900	37,753,771
2016	62,768	4,219,223	1,264,999	1,727,844	11,532	0	29,785,380	37,071,746
2017	64,997	4,374,225	1,312,149	1,789,185	11,941	0	30,875,227	38,427,724
2018	63,444	4,272,075	1,281,806	1,746,464	11,657	0	30,152,278	37,527,724
2019	63,623	4,287,644	1,286,941	1,751,371	11,689	0	30,259,167	37,660,435
2020	62,429	4,194,317	1,257,248	1,718,536	11,470	0	29,611,398	36,855,398
2021	63,783	4,291,817	1,287,332	1,755,786	11,718	0	30,294,185	37,704,621
2022	61,353	4,129,778	1,238,926	1,688,876	11,272	0	29,149,141	36,279,346
2023	50,454	3,405,483	1,022,851	1,388,861	9,269	0	24,029,023	29,905,941
2024	53,079	3,579,867	1,074,861	1,461,138	9,752	0	25,261,854	31,440,551
2025	60,364	4,062,905	1,218,820	1,661,667	11,090	0	28,677,418	35,692,264
2026	23,728	1,619,020	488,537	653,188	4,360	0	11,409,181	14,198,014
2027	24,165	1,650,561	498,274	665,222	4,440	0	11,630,028	14,472,690
2028	15,568	1,068,968	323,423	428,553	2,860	0	7,527,397	9,366,769
2029	16,320	1,121,368	339,368	449,277	2,998	0	7,895,808	9,825,139
2030	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,840,945</b>	<b>122,949,091</b>	<b>36,758,392</b>	<b>50,676,628</b>	<b>338,221</b>	<b>0</b>	<b>868,624,643</b>	<b>1,081,187,920</b>

(a) Under Article 49(d)(4)(A) of its contract, San Bernardino Valley Municipal Water District elected to pay a portion of its allocated costs of East Branch Enlargement in advance rather than to participate in payment of Water System Revenue Bonds. This election made via a letter of agreement signed June 1, 1987. As of June 1999, \$6,347,938 has been received from the San Bernardino Valley Municipal Water District.



**TABLE B-30 Minimum OMP&R Component of East Branch Enlargement Facilities Transportation Charge for Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	320,415	101,486	95,075	0	70,133	2,174,776	2,761,885
1995	0	278,176	86,604	86,479	0	59,461	1,895,643	2,406,363
1996	0	287,293	82,991	106,208	0	55,287	1,990,213	2,521,992
1997	0	389,636	123,446	100,643	0	62,571	2,642,077	3,318,373
1998	0	429,772	135,927	109,979	0	66,278	2,915,152	3,657,108
1999	37	236,006	75,040	60,907	11	39,144	1,599,082	2,010,227
2000	132	407,930	122,490	122,505	40	58,272	2,799,985	3,511,354
2001	10	310,843	90,564	95,110	3	33,359	2,146,667	2,676,556
2002	49	390,469	108,436	139,812	15	46,617	2,724,354	3,409,752
2003	0	461,535	127,179	166,664	0	52,338	3,224,992	4,032,708
2004	1,278	510,656	156,828	143,969	265	75,892	3,487,486	4,376,374
2005	745	475,741	158,187	98,706	154	76,385	3,187,691	3,997,609
2006	2,777	491,685	146,158	152,771	575	70,719	3,382,508	4,247,193
2007	7,866	734,115	225,471	208,066	1,630	110,861	5,013,680	6,301,689
2008	16,988	869,737	226,564	363,095	3,520	108,719	6,145,497	7,734,120
2009	22,534	971,556	255,435	392,247	4,669	112,653	6,852,002	8,611,096
2010	5,354	711,686	212,112	214,743	1,109	95,356	4,892,420	6,132,780
2011	4,171	713,893	211,832	210,331	864	83,245	4,911,111	6,135,447
2012	6,647	712,014	203,598	241,077	1,377	92,863	4,938,549	6,196,125
2013	0	776,020	237,573	216,110	0	107,525	5,302,811	6,640,039
<b>2014</b>	<b>0</b>	<b>851,024</b>	<b>271,630</b>	<b>211,034</b>	<b>0</b>	<b>133,167</b>	<b>5,760,049</b>	<b>7,226,904</b>
2015	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2016	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2017	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2018	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2019	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2020	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2021	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2022	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2023	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2024	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2025	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2026	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2027	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2028	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2029	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2030	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2031	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2032	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2033	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2034	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2035	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
<b>TOTAL</b>	<b>68,588</b>	<b>27,077,640</b>	<b>8,324,119</b>	<b>7,512,364</b>	<b>14,232</b>	<b>3,879,307</b>	<b>184,867,148</b>	<b>231,743,398</b>

**TABLE B-31 Total East Branch Enlargement Facilities  
Transportation Charge for Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley- East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	18,266	1,209,293	360,156	502,810	3,356	0	8,552,529	10,646,410
1989	19,176	1,269,524	378,094	527,854	3,523	0	8,978,504	11,176,675
1990	19,186	1,270,244	378,308	528,153	3,525	0	8,983,597	11,183,013
1991	19,187	1,270,261	378,314	528,160	3,525	0	8,983,717	11,183,164
1992	38,420	2,543,616	757,549	1,057,606	7,059	0	17,989,315	22,393,565
1993	40,029	2,650,139	789,274	1,101,897	7,354	0	18,742,682	23,331,375
1994	39,705	2,949,121	884,376	1,188,061	7,295	70,133	20,765,875	25,904,566
1995	39,632	2,902,004	868,042	1,177,437	7,281	59,461	20,452,246	25,506,103
1996	39,825	2,923,960	868,252	1,202,504	7,317	55,287	20,637,619	25,734,764
1997	41,743	3,153,265	946,520	1,249,728	7,669	62,571	22,187,399	27,648,895
1998	42,642	3,252,898	976,720	1,283,803	7,834	66,278	22,881,259	28,511,434
1999	44,775	3,197,893	957,160	1,292,426	8,230	39,144	22,546,557	28,086,185
2000	49,163	3,654,039	1,089,258	1,472,200	9,048	58,272	25,757,571	32,089,551
2001	49,058	3,558,106	1,057,675	1,445,285	9,014	33,359	25,112,415	31,264,912
2002	47,943	3,561,317	1,052,789	1,458,214	8,814	46,617	25,149,672	31,325,366
2003	40,765	3,160,406	930,966	1,288,824	7,489	52,338	22,312,329	27,793,117
2004	45,477	3,436,878	1,028,326	1,360,659	8,385	75,892	24,182,723	30,138,340
2005	33,889	2,670,040	811,701	1,011,070	6,243	76,385	18,706,517	23,315,845
2006	49,756	3,601,961	1,072,471	1,445,988	9,206	70,719	25,379,434	31,629,535
2007	53,155	3,732,485	1,118,456	1,454,754	9,951	110,861	26,219,168	32,698,830
2008	59,479	3,682,855	1,064,377	1,532,757	11,326	108,719	26,040,825	32,500,338
2009	66,204	3,862,738	1,116,497	1,594,368	12,692	112,653	27,299,426	34,064,578
2010	50,193	3,680,305	1,096,237	1,449,061	9,347	95,356	25,887,504	32,268,003
2011	47,361	3,573,312	1,063,434	1,399,245	8,799	83,245	25,133,896	31,309,292
2012	50,351	3,605,463	1,065,335	1,444,140	9,406	92,863	25,402,008	31,669,566
2013	55,360	4,515,030	1,360,904	1,740,038	10,171	107,525	31,683,236	39,472,264
2014	<b>58,891</b>	<b>4,817,081</b>	<b>1,461,690</b>	<b>1,832,166</b>	<b>10,820</b>	<b>133,167</b>	<b>33,751,990</b>	<b>42,065,795</b>
2015	63,827	5,047,686	1,525,935	1,946,356	11,726	108,022	35,423,443	44,126,995
2016	62,768	4,969,101	1,501,407	1,917,217	11,532	108,022	34,874,923	43,444,970
2017	64,997	5,124,103	1,548,557	1,978,558	11,941	108,022	35,964,770	44,800,948
2018	63,444	5,021,953	1,518,214	1,935,837	11,657	108,022	35,241,821	43,900,948
2019	63,623	5,037,522	1,523,349	1,940,744	11,689	108,022	35,348,710	44,033,659
2020	62,429	4,944,195	1,493,656	1,907,909	11,470	108,022	34,700,941	43,228,622
2021	63,783	5,041,695	1,523,740	1,945,159	11,718	108,022	35,383,728	44,077,845
2022	61,353	4,879,656	1,475,334	1,878,249	11,272	108,022	34,238,684	42,652,570
2023	50,454	4,155,361	1,259,259	1,578,234	9,269	108,022	29,118,566	36,279,165
2024	53,079	4,329,745	1,311,269	1,650,511	9,752	108,022	30,351,397	37,813,775
2025	60,364	4,812,783	1,455,228	1,851,040	11,090	108,022	33,766,961	42,065,488
2026	23,728	2,368,898	724,945	842,561	4,360	108,022	16,498,724	20,571,238
2027	24,165	2,400,439	734,682	854,595	4,440	108,022	16,719,571	20,845,914
2028	15,568	1,818,846	559,831	617,926	2,860	108,022	12,616,940	15,739,993
2029	16,320	1,871,246	575,776	638,650	2,998	108,022	12,985,351	16,198,363
2030	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2031	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2032	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2033	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2034	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
2035	0	749,878	236,408	189,373	0	108,022	5,089,543	6,373,224
<b>TOTAL</b>	<b>1,909,533</b>	<b>150,026,731</b>	<b>45,082,511</b>	<b>58,188,992</b>	<b>352,453</b>	<b>3,879,307</b>	<b>1,053,491,791</b>	<b>1,312,931,318</b>



## CONVERSION FACTORS

Quantity	To convert from customary unit	To metric units	Multiply customary unit by	To convert to customary unit, multiply metric unit by
Length	inches (in)	millimeters (mm)●	25.4	0.03937
	inches (in)	centimeters (cm)	2.54	0.3937
	feet (ft)	meters (m)	0.3048	3.2808
	miles (mi)	kilometers (km)	1.6093	0.62139
Area	square inches (in <sup>2</sup> )	square millimeters (mm <sup>2</sup> )	645.16	0.00155
	square feet (ft <sup>2</sup> )	square meters (m <sup>2</sup> )	0.092903	10.764
	acres (ac)	hectares (ha)	0.40469	2.4710
	square miles (mi <sup>2</sup> )	square kilometers (km <sup>2</sup> )	2.590	0.3861
Volume	gallons (gal)	liters (L)	3.7854	0.26417
	million gallons (10 <sup>6</sup> gal)	megaliters (ML)	3.7854	0.26417
	cubic feet (ft <sup>3</sup> )	cubic meters (m <sup>3</sup> )	0.028317	35.315
	cubic yards (yd <sup>3</sup> )	cubic meters (m <sup>3</sup> )	0.76455	1.308
	acre-feet (af)	thousand cubic meters (m <sup>3</sup> x 10 <sup>3</sup> )	1.2335	0.8107
	acre-feet (af)	hectare-meters (ha - m)■	0.1234	8.107
	thousand acre-feet (taf)	million cubic meters (m <sup>3</sup> x 10 <sup>6</sup> )	1.2335	0.8107
	thousand acre-feet (taf)	hectare-meters (ha - m)■	123.35	0.008107
	million acre-feet (maf)	billion cubic meters (m <sup>3</sup> x 10 <sup>9</sup> )◆	1.2335	0.8107
	million acre-feet (maf)	cubic kilometers (km <sup>3</sup> )	1.2335	0.8107
Flow	cubic feet per second (ft <sup>3</sup> /s)	cubic meters per second (m <sup>3</sup> /s)	0.028317	35.315
	gallons per minute (gal/min)	liters per minute (L/min)	3.7854	0.26417
	gallons per day (gal/day)	liters per day (L/day)	3.7854	0.26417
	million gallons per day (mgd)	megaliters per day (ML/day)	3.7854	0.26417
	acre-feet per day (af/day)	thousand cubic meters per day (m <sup>3</sup> x 10 <sup>3</sup> /day)	1.2335	0.8107
Mass	pounds (lb)	kilograms (kg)	0.45359	2.2046
	tons (short, 2,000 lb)	megagrams (Mg)	0.90718	1.1023
Velocity	feet per second (ft/s)	meters per second (m/s)	0.3048	3.2808
Power	horsepower (hp)	kilowatts (kW)	0.746	1.3405
Pressure	pounds per square inch (psi)	kilopascals (kPa)	6.8948	0.14505
	feet head of water	kilopascals (kPa)	2.989	0.32456
Specific capacity	gallons per minute per foot of drawdown	liters per minute per meter of drawdown	12.419	0.08052
Concentration	parts per million (ppm)	milligrams per liter (mg/L)	1.0	1.0
Electrical conductivity	micromhos per centimeter (μmhos/cm)	microsiemens per centimeter (μS/cm)	1.0	1.0
Temperature	degrees Fahrenheit (°F)	degrees Celsius (°C)	(°F - 32)/1.8	(1.8 x °C) + 32

● When using "dual units," inches are normally converted to millimeters (rather than centimeters).

■ Not used often in metric countries, but is offered as a conceptual equivalent of customary western U.S. practice (a standard depth of water over a given area of land).

◆ ASTM Manual E380 discourages the use of billion cubic meters since that magnitude is represented by giga (a thousand million) in other countries. It is shown here for potential use for quantifying large reservoir volumes (similar to million acre-feet).

### OTHER COMMON CONVERSION FACTORS

1 cubic foot=7.48 gallons=62.4 pounds of water

1 cubic foot per second (cfs)=450 gallons per minute (gpm)

1 cfs=646,320 gallons per day=1.98 af a day

1 acre-foot=approximately 325,851 gallons=43,560 cubic feet

1 million gallons=3.07 acre-feet

1 million gallons per day (mgd)=1,120 af a year



STATE OF CALIFORNIA  
CALIFORNIA NATURAL RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES







MANAGEMENT OF THE  
**CALIFORNIA**  
**STATE WATER**  
**PROJECT**

BULLETIN 132-14 | NOVEMBER 2015

EDMUND G. BROWN JR.  
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California Natural Resources Agency*

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**Bulletin 132-14**

# **Management of the California State Water Project**

*Covers Calendar Year 2013 Activities*



*Published November 2015*

**Edmund G. Brown Jr.** *Governor*  
*State of California*

**John Laird** *Secretary for Natural Resources*  
*California Natural Resources Agency*

**Mark W. Cowin** *Director*  
*Department of Water Resources*



## Foreword

*B*ulletin 132-14, Management of the California State Water Project, continues the Bulletin 132 annual series begun in 1963. Bulletin 132-14 reports water supply planning, construction, financing, management, and operation activities of the State Water Project (SWP). Appendix B contains data and computations used to determine the SWP water contractors' Statements of Charges for 2015. Appendix B was previously printed and distributed to SWP water contractors to document and support calculation of contractors' annual charges.

The Bulletin discusses significant events and issues that affect SWP management and operations. The Bulletin covers the period from January 1, 2013, through December 31, 2013.

Bulletin 132-14 also discusses water supply and delivery as well as Delta resources and environmental issues, local assistance programs, power resources, recreation, and financial analysis of the SWP.

Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than were available at the time of publication, please consult the most recent edition of Bulletin 132 or contact DWR staff in the State Water Project Analysis Office.



Mark W. Cowin  
*Director*





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## California Water Commission

The California Water Commission consists of nine members appointed by the Governor and confirmed by the Senate. Seven members are chosen for their expertise related to the control, storage, and beneficial use of water, and two are chosen for their knowledge of the environment. The commission advises the Director of the Department of Water Resources (DWR) on matters within DWR's jurisdiction, approves rules and regulations, and monitors and reports on the construction and operation of the State Water Project (SWP).

The roles and responsibilities of the California Water Commission are defined in the Water Code, Government Code, and Code of Civil Procedure.

The commission's SWP-specific responsibilities are to:

- conduct an annual review of the construction and operation of the SWP and report to DWR and the Legislature with any recommendations (Water Code Section 165);
- hold public hearings on all additional facilities proposed to be added to the SWP and name any new facilities (Water Code Sections 161.5 and 166); and
- adopt a resolution of necessity, and give each affected person a venue to be heard, before DWR may commence an eminent domain proceeding (Code of Civil Procedure Section 1245.210).

Commission members at the time of publication are:

Joseph Byrne (Chair)

Andrew Ball

Daniel Curtin

Paula Daniels

Joe Del Bosque (Vice-Chair)

Maria Herrera

Paula Landis

David Orth

Armando Quintero



# Acronyms and Abbreviations

## *Symbols*

**8SI** Northern Sierra 8-Station Precipitation Index

**µg/L** micrograms per liter

**µS/cm** microsiemens per centimeter

## *A*

**AB** Assembly Bill

**af** acre-feet/acre-foot

**AWMP** Agricultural Water Management Plan

## *B*

**Bay-Delta** San Francisco Bay/Sacramento-San Joaquin Delta

**Bay-Delta Estuary** San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**Bay-Delta Plan** Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary

**BDCP** Bay Delta Conservation Plan

**BiOp** biological opinion

## *C*

**CAISO** California Independent System Operator

**CALFED** CALFED Bay-Delta Program

**California State Parks** California Department of Parks and Recreation

**Caltrans** California Department of Transportation

**CAMAL Net** California Association of Mutual Aid Laboratories Network

**C.A.S.T.** Catch A Special Thrill

**CCTAG** Climate Change Technical Advisory Group

**CDPH** California Department of Public Health

**CEQA** California Environmental Quality Act

**CESA** California Endangered Species Act

**cfs** cubic feet per second

**CIMIS** California Irrigation Management Information System

**Corps** U.S. Army Corps of Engineers

**CVC** Cross Valley Canal

**CVP** Central Valley Project

**CWC** California Water Code

**D**

**D-1641** State Water Resources Control Board, Water Right Decision 1641  
**DCAA** 2,4-dichlorophenylacetic acid  
**DCPA** Dacthal  
**DDA** Davis-Dolwig Act  
**DFW** Department of Fish and Wildlife  
**DHCCP** Delta Habitat Conservation and Conveyance Program  
**DMCP** Delta Mercury Control Program  
**DO** dissolved oxygen  
**DOE** Division of Engineering  
**DSC** Delta Stewardship Council  
**DSM2** Delta Simulation Model 2  
**DSOD** Division of Safety of Dams  
**DWR** Department of Water Resources  
**DWSC** Deep Water Ship Channel

**E**

**EC** electrical conductivity  
**EIR** environmental impact report  
**EIS** environmental impact statement  
**EPA** U.S. Environmental Protection Agency  
**ESA** federal Endangered Species Act  
**ETO** reference evapotranspiration

**F**

**FERC** Federal Energy Regulatory Commission  
**FRFH** Feather River Fish Hatchery  
**FRP** Fish Restoration Program

**G**

**GHG** greenhouse gas

**H**

**HEA** Habitat Expansion Agreement  
**Hg** mercury  
**Hyatt-Thermalito** Hyatt Pumping-Generating Plant and Robie Thermalito Pumping-Generating Plant

**I**

**IFDM** Integrated On-Farm Drainage Management  
**IR** Interim Renewal  
**IRWM** Integrated Regional Water Management  
**ITP** incidental take permit

**K**

**kV** kilovolt  
**kWh** kilowatt hour

**L**

**LADWP** Los Angeles Department of Water and Power  
**LTMS** Long-Term Management Strategy

**M**

**maf** million acre-feet  
**MeHg** methylmercury  
**MERP** Mercury Exposure Reduction Program  
**mg/L** milligrams per liter  
**MIDS** Morrow Island Distribution System  
**MME** Mercury Monitoring and Evaluation  
**MRTU** Market Redesign and Technology Upgrade  
**mS/cm** millisiemens per centimeter  
**MW** megawatt  
**MWh** megawatt hour(s)  
**MWQI** Municipal Water Quality Investigations  
**MWQP** Municipal Water Quality Program  
**MWT** McCormack-Williamson Tract

**N**

**NDFCERP** North Delta Flood Control and Ecosystem Restoration Project  
**NDOI** Net Delta Outflow Index  
**NEPA** National Environmental Policy Act  
**NERC** North American Electric Reliability Corporation  
**NOAA Fisheries** National Marine Fisheries Service  
**NVE** NV Energy

**O**

**OMP&R** operations, maintenance, power, and replacement  
**OM&R** operations, maintenance, and replacement

**P**

**PAO** Public Affairs Office  
**PG&E** Pacific Gas & Electric Company  
**PSP** proposal solicitation package

**Q**

**QA/QC** Quality Assurance/Quality Control Program  
**QSA** Quantification Settlement Agreement

**R**

**Reclamation** Bureau of Reclamation  
**RETI** Renewable Energy Transmission Initiative  
**R&FWE** Recreation and Fish and Wildlife Enhancement  
**RIMPR** Renewable Integration Market and Product Review  
**RM** River Mile  
**RPA** reasonable and prudent alternative  
**RRR** Red Rock Ranch  
**RRSDS** Roaring River Slough Distribution System  
**RST** rotary screw trap  
**RTDF-CP** Real Time Data and Forecasting Comprehensive Program  
**RWQCB** Regional Water Quality Control Board

**S**

**Sacramento Valley 40-30-30 Index** Sacramento Valley Water Year Hydrologic Classification  
**San Joaquin Valley 60-20-20 Index** San Joaquin Valley Water Year Hydrologic Classification  
**SARMP** Settlement Agreement Recreation Management Plan  
**SB** Senate Bill  
**SBA** South Bay Aqueduct  
**SBX7 7** Water Conservation Act of 2009  
**SCE** Southern California Edison  
**SDG&E** San Diego Gas & Electric  
**SDIP** South Delta Improvements Program  
**SJR** San Joaquin 4 Rivers  
**SMPA** Suisun Marsh Preservation Agreement  
**SMSCG** Suisun Marsh Salinity Control Gates  
**SRCD** Suisun Resource Conservation District  
**SRR** Sacramento River Region  
**SWP** State Water Project  
**SWPAO** State Water Project Analysis Office  
**SWRCB** State Water Resources Control Board

**T**

**TLR** Tulare Lake Region

**U**

**USFWS** U.S. Fish and Wildlife Service

**W**

**WCD** water conservation district

**WD** water district

**WET** Water Education for Teachers

**WQCP** water quality control plan

**Y**

**Yuba Accord** Lower Yuba River Accord

## SWP Long-term Water Contractors

The State Water Project long-term water supply contractors are listed below, followed by shortened forms of their names that are used in Bulletin 132.

Alameda County Flood Control and Water Conservation District, Zone 7	Alameda-Zone 7
Alameda County Water District	Alameda County
Antelope Valley-East Kern Water Agency	AVEK
Castaic Lake Water Agency	Castaic Lake
City of Yuba City	Yuba City
Coachella Valley Water District	Coachella
County of Butte	Butte
County of Kings	Kings
Crestline-Lake Arrowhead Water Agency	Crestline
Desert Water Agency	Desert
Dudley Ridge Water District	Dudley Ridge
Empire West Side Irrigation District	Empire
Kern County Water Agency	Kern
Littlerock Creek Irrigation District	Littlerock
The Metropolitan Water District of Southern California	Metropolitan
Mojave Water Agency	Mojave
Napa County Flood Control and Water Conservation District	Napa
Oak Flat Water District	Oak Flat
Palmdale Water District	Palmdale
Plumas County Flood Control and Water Conservation District	Plumas
San Bernardino Valley Municipal Water District	San Bernardino
San Gabriel Valley Municipal Water District	San Gabriel
San Geronio Pass Water Agency	San Geronio
San Luis Obispo County Flood Control and Water Conservation District	San Luis Obispo
Santa Barbara County Flood Control and Water Conservation District	Santa Barbara
Santa Clara Valley Water District	Santa Clara
Solano County Water Agency	Solano
Tulare Lake Basin Water Storage District	Tulare
Ventura County Watershed Protection District	Ventura





## State Water Project Highlights

*Twitchell Island in the Delta.*





The annual Bulletin 132 series began in 1963 and reported the first deliveries of water by the new State Water Project (SWP). Bulletin 132-14, *Management of the California State Water Project*, continues this series as the fifty-second edition. It reports on SWP planning, construction, finance, management, and operations during calendar year 2013. The SWP is operated and maintained by the California Department of Water Resources (DWR).

The SWP is one of the world's largest water, power, and conveyance systems. In the past decade it has conveyed an annual average of 2.9 million acre-feet (maf) of water. SWP facilities—pumping and power plants; reservoirs, lakes, and storage tanks; canals, tunnels, and pipelines—capture, store, and convey water to public water agencies and local water districts.

## Drought Response

For many parts of California, 2013 was the driest year on record. In anticipation of another dry year in 2014, DWR appointed a Drought Manager and Deputy Drought Manager in December. Also in December, DWR conducted a drought preparedness workshop, one of the seven DWR drought preparedness events held throughout California.

## Water Supply Contract Extension Program

On May 1, 2013, DWR met with SWP contractors and the public to begin negotiating the extension of the water supply contracts. The extension will allow DWR to continue to sell bonds with 30-year terms, ensuring the debt service on these bonds remains affordable to SWP contractors and their water customers.

## Yearly Activities Summary

### 2013 Precipitation and Water Storage

Water stored and delivered by the SWP conservation and transportation facilities originates from rainfall and snowmelt in Northern and Central California watersheds, where most of the State's precipitation

occurs. DWR monitors and records annual precipitation and runoff during each water year, which begins on October 1 and ends on September 30.

### Precipitation and Mountain Snowpack in Water Year 2012–2013

California experienced below-average rainfall and mountain snowpack during water year 2012–2013. The State received precipitation at 79 percent of average in 2012–2013, compared to 77 percent of average in water year 2011–2012. The Northern Sierra 8-Station Precipitation Index finished the water year with 44.3 inches of precipitation, which was 89 percent of average. The statewide average snow water equivalent, based on snow sensors, reported for April 1, was 13.2 inches, or 47 percent of average.

### River Runoff

Statewide river runoff totaled 60 percent of average in the 2012–2013 water year. Runoff in the Sacramento River Region, the San Joaquin 4 Rivers, and the Tulare Lake Region was 67, 51, and 36 percent of average, respectively.

### Water Supply Indices

The Sacramento Valley Water Year Hydrologic Classification and the San Joaquin Valley Water Year Hydrologic Classification

were “dry” and “critical,” respectively, based on all observed data for water year 2012–2013.

### **Water Year 2012–2013 Statewide Storage Totals**

For water year 2012–2013, monthly storage totals for the major Sierra reservoirs began at 95 percent of average following a dry 2011–2012 water year. The percent of average storage increased through December, which ended at 110 percent of average. Then, the average decreased each month through July, which ended with 79 percent of average. August and September also ended with 79 percent of average.

### **2013 Storage Totals in Major SWP Reservoirs**

End-of-year storage on December 31, 2013, in major SWP reservoirs and the State’s share of joint-use reservoirs was 2.2 maf or 41 percent of maximum storage, compared to 2.3 maf or 44 percent of maximum storage at the end of 2012. The average end-of-month total storage in major SWP reservoirs for 2013 was 3.1 maf.

### **Diversions from the Delta**

In 2013, the SWP diverted 1,814,837 acre-feet (af) at Banks Pumping Plant. There was 19,311 af of Cross Valley Canal water and 37,953 af of Central Valley Project (CVP) water wheeled at Banks Pumping Plant by DWR during 2013.

Maximum daily Delta exports occurred August 25 at 23,631 af. Combined SWP and CVP monthly Delta exports in 2013 varied from a low of 105,901 af in April, to a high of 608,691 af in August. Delta exports totaled approximately 3.46 maf in 2013.

For more information, see Chapter 8, Water Supply.

## **2013 Water Supplies, Contracts, and Deliveries**

### **2013 Water Deliveries**

DWR approved delivery of 1.25 maf on November 29, 2012, resulting in initial Table A amounts of 30 percent of most SWP water contractor requests. DWR increased the 2013 Table A amounts to 1.46 maf, for a final allocation of 35 percent, on March 22, 2013. For more information on changes in Table A amounts that were approved by DWR, see Chapter 9, Water Contracts and Deliveries.

In 2013, 3,371,000 af of SWP and non-SWP water was delivered to 29 long-term SWP water contractors and 23 other agencies.

The portion delivered to the SWP water contractors was 2,108,416 af, categorized as follows:

- 1,084,692 af of Table A water;
- 54,115 af of transferred Table A water;
- 32,329 af of exchanged Table A water;
- 98,732 af of Pool A water;
- 350,555 af of carryover water;
- 326,050 af recovered from water banks and delivery of backup water;
- 1,752 af of settlement water;
- 2 af of SWP water for recreation and fish and wildlife;
- 41,048 af of 2013 Yuba Accord Dry Year Purchase Program water;
- 8,048 af of local water;
- 67,410 af of Other Temporary Transfer Programs;
- 30,299 af of general conveyance water;
- 842 af of operations exchange water;
- 1,085 of transfer water; and
- 11,457 af of permit water.

The remaining portion was delivered to 23 non-SWP agencies and

totaled 1,262,584 af, which was categorized accordingly:

- 1,192,836 af of local water;
- 1,639 af of SWP water for recreation and fish and wildlife; and
- 68,109 af delivered to satisfy agreements between the SWP and CVP.

Table H-1 shows SWP water deliveries by category for 1962 through 2013.

For more information, see Chapter 9, Water Contracts and Deliveries.

## Power Resources

In 2013, DWR sold 1.35 million megawatt hours (MWh) of energy for a total of \$94.07 million. These sales included 936,975 MWh of energy with revenue of \$42.32 million transacted through WSPP and sold to 11 marketers. They also included 413,462 MWh with revenue of \$18.39 million sold to long-term contractors, and \$33.35 million connected to bilateral trades with the California Independent System Operator (CAISO). DWR also received \$49.66 million in revenues from capacity and other energy-related services. This value includes, among other things, \$47.44 million for ancillary services transactions made through CAISO. It also includes \$369,135 for ancillary service fees collected from the U.S. Department of Energy, Western Area Power Administration, associated with the June 27, 2012, contract with DWR for CAISO Scheduling Coordinator Services.

The sidebar, State Water Project Power Generation and Consumption in 2013, summarizes amounts of power generated and consumed by the SWP. For detailed information, see Chapter 10, Power Resources.

## Oroville Facilities Relicensing

On January 26, 2005, DWR filed an application with the Federal Energy

Regulatory Commission (FERC) requesting a new license for the Oroville Facilities (FERC Project No. 2100). The existing 50-year hydropower license expired January 31, 2007, and, until a new license is issued, FERC is issuing annual licenses. A partial list of SWP facilities that will be subject to the new license terms and conditions is available in Chapter 10, Power Resources.

A number of significant events associated with Oroville Facilities relicensing occurred in 2013. For details, see Chapter 3, Environmental Programs; Chapter 6, Legislation and Litigation; Chapter 10, Power Resources; and Chapter 13, Recreation.

## Financial Analysis

In 2013, DWR continued to pay bondholders as scheduled. The SWP was financially viable and was indirectly paid for by the approximately 25 million water users served by the project. Direct payment was through the 29 long-term water contractors. In 2013, the SWP handled approximately \$1.02 billion in revenues and \$1.02 billion in expenses. The 2013 Income Statement for the State Water Project sidebar presents a summary of the year's revenues and expenses. For detailed information, see Chapter 14, Financial Analysis.

## Engineering, Construction, and Real Estate

In 2013, engineering, construction, and real estate work to enhance, expand, repair, and protect the SWP and other facilities within the State continued. Significant projects included the South Bay Aqueduct enlargement, expansion of the South Bay Pumping Plant, Perris Dam remediation, and the East Branch Extension Phase I Improvements and Phase II projects.

DWR worked on 58 construction contracts in 2013. Projects included fire clean-up, pipeline repair, control system upgrades,

**Table H-1 SWP Water Delivered by Category, 1962–2013 (acre-feet)**

Year	Table A Water			Article 21/Unscheduled		Other SWP Water Deliveries				Total Deliveries
	Municipal and Industrial	Agricultural	Total Table A <sup>a</sup>	Municipal and Industrial	Agricultural	Other Water <sup>b</sup>	Feather River Diversions <sup>c</sup>	Fish & Wildlife/ Recreation Water		
1962	0	0	0	0	0	9,704	7,499	0	17,203	
1963	0	0	0	0	0	13,212	16,049	0	29,261	
1964	0	0	0	0	0	21,743	17,891	0	39,634	
1965	0	0	0	0	0	35,985	27,425	0	63,410	
1966	0	0	0	0	0	59,599	33,361	0	92,960	
1967	5,563	5,791	11,354	0	0	45,225	24,639	0	81,218	
1968	86,541	85,168	171,709	10,000	111,534	1,214	903,367	0	1,197,824	
1969	63,956	129,064	193,020	0	72,397	8,692	832,454	0	1,106,563	
1970	83,415	150,578	233,993	0	131,848	25,401	804,320	0	1,195,562	
1971	93,776	263,564	357,340	0	294,581	35,438	825,886	8	1,513,253	
1972	186,796	425,005	611,801	0	422,322	53,848	875,529	6,489	1,969,989	
1973	297,497	395,391	692,888	0	294,916	29,540	851,285	1,155	1,869,784	
1974	423,982	450,093	874,075	0	412,453	31,493	963,956	2,118	2,284,095	
1975	670,492	553,498	1,223,990	356	620,329	46,995	924,696	3,377	2,819,743	
1976	631,876	741,126	1,373,002	4,147	547,538	103,546	1,018,653	1,745	3,048,631	
1977	354,930	218,966	573,896	0	0	410,991	624,497	1,111	1,610,495	
1978	782,625	529,740	1,312,365	0	16,215	177,245	836,864	1,691	2,344,380	
1979	692,888	711,404	1,404,292	0	646,830	431,693	933,067	1,766	3,417,648	
1980	726,545	784,946	1,511,491	52,200	350,017	40,269	925,750	2,131	2,881,858	
1981	1,053,273	835,852	1,889,125	18,920	889,508	283,310	993,785	4,688	4,079,336	
1982	916,014	822,042	1,738,056	140	214,994	144,267	819,586	4,646	2,921,689	
1983	482,749	701,370	1,184,119	0	13,019	172,030	633,778	7,849	2,010,795	
1984	725,799	861,794	1,587,593	3,663	259,254	366,273	891,128	7,040	3,114,951	
1985	983,341	929,424	1,912,765	9,638	292,206	474,417	924,049	4,033	3,617,108	
1986	998,611	1,009,295	2,007,906	2,595	21,755	177,176	843,040	3,865	3,056,337	
1987	1,079,983	1,033,932	2,113,915	6,949	107,958	375,810	882,301	7,672	3,494,605	
1988	1,308,071	1,068,302	2,376,373	0	0	520,375	884,877	4,889	3,786,514	
1989	1,602,543	1,251,204	2,853,747	0	0	474,559	830,500	8,135	4,166,941	
1990	1,876,072	706,079	2,582,151	0	90	424,697	875,099	9,262	3,891,299	
1991	536,669	12,444	549,113	3,521	0	543,582	565,395	4,879	1,666,490	
1992	955,687	455,112	1,410,799	1,156	0	166,992	613,978	2,605	2,195,530	
1993	1,069,258	1,243,978	2,313,236	0	0	256,853	822,589	2,609	3,395,287	
1994	1,134,992	614,359	1,749,351	48,150	64,475	236,739	874,018	8,200	2,980,933	
1995	801,570	1,165,523	1,967,093	17,984	46,346	85,560	860,077	2,575	2,979,635	
1996	1,143,638	1,371,186	2,514,824	12,091	16,556	252,346	1,005,148	3,907	3,804,872	
1997	1,220,200	1,040,183	2,260,383	2,814	18,618	322,000	993,211	4,146	3,601,172	
1998	865,795	860,724	1,726,519	9,982	10,306	127,405	872,738	2,108	2,749,058	
1999	1,405,311	1,333,592	2,738,903	61,191	96,879	85,312	1,108,672	4,324	4,095,281	
2000	1,946,451	1,222,485	3,168,936	170,302	138,483	342,688	1,085,886	4,096	4,910,391	
2001	1,171,421	407,870	1,579,291	14,971	33,174	524,768	1,077,997	2,942	3,233,143	
2002	1,849,052	716,578	2,565,630	15,478	27,637	241,268	1,131,880	3,712	3,985,605	
2003	2,156,072	787,170	2,943,242	23,019	36,809	249,884	1,006,995	2,862	4,262,811	
2004	1,951,217	643,509	2,594,726	103,890	114,606	453,603	1,171,835	2,887	4,441,547	
2005	1,923,222	904,034	2,827,256	186,787	544,296	92,858	1,074,706	1,515	4,727,418	
2006	1,973,662	999,687	2,973,349	293,358	327,981	143,774	1,094,944	3,628	4,837,034	
2007	1,570,857	510,040	2,080,897	185,825	124,148	713,993	1,193,237	2,581	4,300,681	
2008	1,014,147	224,012	1,238,159	2,729	0	842,893	1,087,669	2,778	3,174,228	
2009	883,760	348,993	1,232,753	6,032	0	798,348	1,125,147	2,047	3,164,327	
2010	1,421,463	509,466	1,930,929	7,158	347	778,035	978,172	1,167	3,695,808	
2011	1,871,986	975,586	2,847,572	207,307	213,384	413,160	1,028,542	1,593	4,711,558	
2012	1,844,350	714,349	2,558,699	0	0	401,523	1,047,832	1,609	4,009,663	
2013	1,195,815	424,608	1,620,423	0	0	582,301	1,166,635	1,641	3,371,000	
<b>Total</b>	<b>48,033,933</b>	<b>32,149,116</b>	<b>80,183,049</b>	<b>1,482,353</b>	<b>7,533,809</b>	<b>13,650,632</b>	<b>43,012,634</b>	<b>154,081</b>	<b>146,016,558</b>	

<sup>a</sup> Includes Table A, Table A transfers, Table A exchanges, Carryover, and Pool Water.<sup>b</sup> Includes water conveyed for SWP and non-SWP water contractors.<sup>c</sup> Includes amounts of water diverted according to various water rights agreements.



## State Water Project Power Generation and Consumption in 2013

<b>Power Generation and Consumption</b>	<b>Megawatt Hours</b>
Energy generation by SWP facilities	3,068,539
Energy sources and firm purchases under agreements and exchanges	3,604,135
<b>Total Energy Available to the SWP</b>	<b>6,672,674</b>
Energy sales	(936,975)
<b>Net SWP Power Consumption<sup>a</sup></b>	<b>5,735,699</b>

<sup>a</sup> Totals may not sum due to rounding.

and recreation and maintenance facility improvements at dam and reservoir sites.

DWR processed a net total of \$2.76 million in payments in 2013 in support of right-of-way activities required for the construction, operation, and maintenance of the SWP. DWR also conducted real estate activities related to SWP acquisitions, temporary permits, property management, and appraisals.

For more information, see Chapter 12, Engineering, Construction, and Real Estate.

## Delta Resources and Environmental Issues

### *Delta Stewardship Council*

The *Delta Plan* was adopted by the Delta Stewardship Council on May 16, 2013. It became effective with legally enforceable regulations on September 1, 2013.

### *Bay Delta Conservation Plan*

In August 2013, DWR announced changes to the proposed water conveyance tunnels. These changes included decreasing the intermediate forebay from 750 to 40 acres and realigning a segment of the tunnels to the east to shift construction impacts from private to public lands. The purpose of these changes was to reduce the effects of the project on Delta residents. In total, the proposed changes would decrease the permanent water conveyance project footprint from 3,654 acres to 1,851 acres.

On December 13, 2013, the draft Bay Delta Conservation Plan and its associated environmental impact report/environmental impact statement were released for public comment.

### *Fish Science Building*

Construction of a Fish Science Building was near completion at Skinner Fish Facility in

## 2013 Income Statement for the State Water Project

<b>Revenues</b>	<b>Thousands of Dollars</b>
Water Contract Payments	1,080,088
Revenue Bond Cover Adjustments	(47,054)
Rate Management Adjustments	(40,470)
Other Revenues	30,122
<b>Total Operating Revenues</b>	<b>1,022,686</b>
<b>Expenses</b>	
Project Operations, Maintenance, Power, and Replacement	684,805
Deposits to Reserves	47,112
Water Bond Principal	175,213
Water Bond Interest	115,556
<b>Total Operating Expenses and Debt Service</b>	<b>1,022,686</b>
<b>Net System Revenues</b>	<b>0</b>

late 2013. The facility will be used for various fishery studies needed to meet regulatory requirements of the biological opinions and incidental take permit for long-term operation of the SWP and CVP.

### ***Suisun Marsh Plan***

On April 21, 2013, the Bureau of Reclamation and the U.S. Fish and Wildlife Service signed the record of decision for the *Suisun Marsh Habitat Management, Preservation, and Restoration Plan*.

For more information about Delta resources and environmental issues, see Chapter 2, Delta Resources; Chapter 3, Environmental

Programs; and Chapter 4, Water Quality Programs.

### **Recreation**

In 2013, SWP facilities supported an estimated 4.0 million recreation days of use, down nearly 3 percent from 2012 and 2 percent from 2011. Most SWP recreation use was concentrated at the lakes and major reservoirs, with 37 percent occurring in the Oroville Field Division and 45 percent occurring in the Southern Field Division. For further information, see Chapter 13, Recreation.

## SWP Security Measures

Security and protection of the SWP remain primary goals for DWR. SWP facilities are closely monitored, and DWR staff are vigilant in maintaining a secure environment. Security patrols of SWP facilities are frequent and ongoing, and plans are in place to address potential or actual acts of terrorism. Security system improvements continue in conjunction with the Bureau of Reclamation and other federal and State agencies.

## SWP Milestones through the Decades

### 50 Years Ago—1963

Construction began on San Luis Dam and various other major features of the joint-use facilities of the SWP and the federal CVP.

Construction began on Banks Pumping Plant in the South Delta, the starting point of the California Aqueduct.

By the end of 1963, a total of 30 water supply contracts had been signed.

### 40 Years Ago—1973

Initial facilities of the SWP were completed.

Three new fishing access sites were opened to the public—Fairfax, adjacent to Fairfax Avenue in Fresno County; Avenal Gap Road, adjacent to Avenal Cutoff Road in Kings County; and Kettleman City, adjacent to Milham Avenue also in Kings County—bringing the total number of California Aqueduct fishing access sites in the San Joaquin Valley to 11.

On September 1, 1973, an initial 28-mile section of bikeway was opened to the public, extending from Pearblossom Pumping Plant south to Interstate 15 near Hesperia. Together with the 67 miles opened in 1972 between Bethany Reservoir and San Luis

Forebay, a total 95 miles of bikeway was in operation at the end of 1973.

### 30 Years Ago—1983

To better manage its power needs, DWR became a bulk power agency, making the SWP the fifth largest electric utility in California.

Record high rainfall totals were reported statewide in California for water year 1982–1983 (1983 is the wettest year on record).

### 20 Years Ago—1993

In February, the Governor declared the end of the 1987–1992 drought.

In May, the twenty-fifth anniversary of the dedication of Oroville Dam was celebrated.

DWR began construction on Phase II of the Coastal Branch in August. This pipeline project allowed SWP water to be transported to Santa Barbara and San Luis Obispo counties as a supplemental water supply.

Vista del Lago Visitors Center opened at Pyramid Lake in November.

### 10 Years Ago—2003

On March 20, the East Branch Extension Phase I was dedicated. It allowed the SWP to bring water to the communities of Redlands, Yucaipa, Banning, and Beaumont.

In May, the Monterey Settlement Agreement was executed and approved by the court, allowing the SWP to continue to operate pursuant to the Monterey Agreement while a new environmental impact report was prepared.





# Chapter 1

## The State Water Project

*Waterways and fields in the Sacramento-San Joaquin Delta.*



*T*his chapter primarily provides background on the State Water Project (SWP), including brief descriptions of SWP facilities, planning, construction, power operations, financing, contracting agencies, and the project's many uses and functions. It also provides a glimpse of California history, with a look at the processes and decisions that went into the creation of the largest state-built water project in the country.

Chapters 2 through 15 provide more detail on significant events and specific topics related to management of the SWP in calendar year 2013. At the end of the bulletin, Appendix B presents data and computations used to determine the SWP Contractors' Statements of Charges for 2015.

*Information in this chapter was contributed by the Division of Operations and Maintenance and the State Water Project Analysis Office.*



California's diverse geography contains both the highest and lowest elevations in the coterminous United States, with a resulting diversity of climate that ranges from desert to alpine to subtropical. In a typical year, some areas receive as little as 2 inches of rain, while others receive more than 100 inches. This diversity of geography and climate creates an intricate and constantly changing pattern of water supplies, which, in turn, creates enormous challenges in managing this vital resource.

## The State Water Project

Like present-day Californians, the earliest settlers faced the problem of how best to conserve, control, and deliver water. Remains of aqueducts, canals, and dams are still found near some of California's original missions. The first recorded aqueduct, built in 1770 to serve the San Diego mission, was 6 miles long. In the early twentieth century, several cities, including San Francisco and Los Angeles, built aqueducts to convey water from the Sierra Nevada to other parts of the State.

In 1951, after many years of discussion and study, the Legislature authorized construction of a water storage and supply system to capture and store rainfall and snowmelt runoff in Northern California and deliver it to areas of need throughout the State. Eight years later, the Legislature passed the Burns-Porter Act, which provided the mechanism for obtaining funds necessary to construct the initial State Water Project (SWP) facilities. In 1960, California voters approved issuance of \$1.75 billion in general obligation bonds, as authorized in the act, thereby securing funds to build the SWP. In 1962, the first water was delivered through a portion of the South Bay Aqueduct to two long-term contracting agencies in Alameda County.

Today the SWP, built, operated, and managed by the Department of Water Resources (DWR), is the largest state-built,

multipurpose, user-financed water project in the country. It was designed and built to deliver water, control flooding, generate power, provide recreational opportunities, and enhance habitat for fish and wildlife. SWP water irrigates about 750,000 acres of farmland, mainly in the southern San Joaquin Valley. Approximately 25 million of California's estimated 37 million residents benefit from SWP water.

## Precipitation and Runoff

The water stored and delivered by the SWP originates from rainfall and snowmelt runoff in Northern and Central California's watersheds, where most of the State's precipitation occurs.

Since 1968, DWR has monitored and recorded annual precipitation and runoff, because precipitation, snowpack, and the rate and amount of snowmelt help determine how much water the SWP can deliver in any given year. The DWR-designated water year is October 1 through September 30.

## Water Delivery Facilities

The SWP depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, and aqueducts to deliver water. Although initial water transportation facilities were essentially completed in 1973, other facilities have since been built, and still others are either under construction or are planned to be built, as needed.

The SWP facilities include 30 dams (29 of which impound water), 20 reservoirs, 29 pumping and generating plants, and approximately 700 miles of aqueducts. Figure 1-1 shows the names and locations of primary water delivery facilities. For more information about existing long-term SWP water supply contracts and annual water deliveries, see Table 1-6 (at the end of this chapter) and Chapter 9, Water Contracts and Deliveries.

Changes have occurred since the long-term SWP water supply contracts were signed in the 1960s, including population growth, differences in local water use, local water conservation programs, and conjunctive-use programs. Demands for SWP water are expected to increase and change as California's population continues to grow and as the potentially serious effects of climate change impact the State's water resources.

## Project Design

Water from rainfall and snowmelt runoff is stored in SWP conservation facilities and delivered via SWP transportation facilities to water agencies and districts in the Upper Feather River, North Bay, South Bay, San Joaquin, Central Coastal, and Southern California areas.

Three small reservoirs—Antelope Lake, Lake Davis, and Frenchman Lake—are the northernmost SWP facilities. Situated on Feather River tributaries in Plumas County, these lakes are used primarily for recreation. They also provide water to the City of Portola and local agencies that have water rights agreements with DWR.

Downstream from these lakes lies Lake Oroville, which conserves water from the Feather River watershed. Created by Oroville Dam, the tallest earthfill dam in the Western Hemisphere, Lake Oroville is the project's

largest storage facility with a capacity of approximately 3.5 million acre-feet (af).

Releases from Lake Oroville flow down the Feather River into the Sacramento River, which drains the northern portion of California's great Central Valley. The Sacramento River flows into the Sacramento-San Joaquin Delta, comprising 738,000 acres of land interlaced with channels that receive runoff from 40 percent of the State's land area. The SWP, federal Central Valley Project (CVP), and local agencies all divert water from the Delta.

From the northern Delta, Barker Slough Pumping Plant diverts water for delivery to Napa and Solano counties through the North Bay Aqueduct, which was completed in 1988. Near Byron, in the southern Delta, the SWP diverts water into Clifton Court Forebay for delivery south of the Delta. Banks Pumping Plant lifts water from Clifton Court Forebay into the California Aqueduct, which flows to Bethany Reservoir. From Bethany Reservoir, the South Bay Pumping Plant lifts water into the South Bay Aqueduct to supply Alameda and Santa Clara counties. The South Bay Aqueduct provided initial deliveries in 1962 and has been fully operational since 1965.

Most of the water delivered to Bethany Reservoir from Banks Pumping Plant flows into the California Aqueduct. This 444-mile-long main aqueduct conveys water to the agricultural lands of the San Joaquin Valley and to the urban regions of Southern California.

The California Aqueduct winds along the west side of the San Joaquin Valley. It transports water to O'Neill Forebay, Gianelli Pumping-Generating Plant, and San Luis Reservoir. San Luis Reservoir has a storage capacity of more than 2 million af and is jointly owned by DWR and the Bureau of Reclamation (Reclamation). DWR's share of gross storage in the reservoir is 1,062,183 af. Generally, water is pumped into San Luis



Figure 1-1 Names and Locations of Primary Water Delivery Facilities, December 31, 2013



Reservoir from late fall through early spring, where it is temporarily stored for release back to the California Aqueduct to meet summertime peaking demands of SWP and CVP water contractors.

SWP water not stored in San Luis Reservoir and water released from San Luis flows south through the San Luis Canal, a portion of the California Aqueduct jointly owned by DWR and Reclamation.

As the water flows through the San Joaquin Valley, numerous turnouts convey it to farmlands within the service areas of the SWP and CVP. Along its journey, this water is lifted more than 1,000 feet by four pumping plants—Dos Amigos, Buena Vista, Teerink, and Chrisman—before reaching the foot of the Tehachapi Mountains.

In the southern San Joaquin Valley, near Kettleman City, Phase I of the Coastal Branch Aqueduct serves agricultural areas west of the California Aqueduct. In August 1997, completion of Phase II extended the Coastal Branch Aqueduct to serve municipal and industrial water users in San Luis Obispo and Santa Barbara counties.

The remaining water conveyed by the California Aqueduct is delivered to Southern California, home to roughly two-thirds of California's population. Before it can be delivered, the water must first cross the Tehachapi Mountains. Fourteen 80,000-horsepower pumps at Edmonston Pumping Plant, situated at the foot of the mountains, raise the water 1,926 feet—the highest single lift of any pumping plant in the world. The water enters 8.5 miles of tunnels and siphons as it flows into Antelope Valley, where the California Aqueduct divides into two branches: the East Branch and the West Branch.

The East Branch carries water through Alamo Powerplant, Pearblossom Pumping Plant, and Mojave Siphon Powerplant into

Silverwood Lake in the San Bernardino Mountains. From Silverwood Lake, water flows through the San Bernardino Tunnel to Devil Canyon Powerplant. Water continues down the East Branch through the Santa Ana Pipeline to Lake Perris, the southernmost SWP reservoir.

The East Branch Extension is a nearly 33-mile pipeline linking parts of service areas for San Bernardino Valley Municipal Water District and San Geronio Pass Water Agency to the California Aqueduct. The East Branch Extension, Phase I, carries water from Devil Canyon Powerplant Afterbay to Cherry Valley, bringing water to Yucaipa, Calimesa, Beaumont, Banning, and other communities. Phase II, when completed, will assist with this delivery.

Water in the West Branch flows through Oso Pumping Plant, Quail Lake, and then from the Peace Valley Pipeline through Warne Powerplant into Pyramid Lake in Los Angeles County. From there it flows through the Angeles Tunnel, Castaic Powerplant, Elderberry Forebay, and into Castaic Lake, terminus of the West Branch. Castaic Powerplant is operated by the Los Angeles Department of Water and Power.

The energy needed to operate the SWP, the largest single user of electrical power in California, comes from a combination of its own hydroelectric and coal-fired generating plants and power purchased from and exchanged with other utilities. The coal-fired plant and the project's eight hydroelectric power plants, including four pumping-generating plants, produce enough electricity in a normal year to supply about two-thirds of the SWP's necessary operating power.

Tables 1-1 through 1-5 present statistical information about primary storage facilities, primary dams, pumping plants, power plants, and aqueducts.

**Table 1-1 Physical Characteristics of Primary Storage Facilities**

Facility	Data at Absolute Maximum Elevation		
	Gross Capacity (acre-feet)	Surface Area (acres)	Shoreline (miles)
Antelope Lake	22,600	930	15
Frenchman Lake	55,500	1,580	21
Lake Davis	84,400	4,030	32
Lake Oroville	3,537,600	15,810	167
Thermalito Forebay	11,800	630	10
Thermalito Afterbay	57,000	4,300	26
Thermalito Diversion Pool	13,400	320	10
Clifton Court Forebay	31,300	2,180	8
Bethany Reservoir	5,100	180	6
Lake del Valle	77,100	1,060	16
San Luis Reservoir	2,027,800	12,520	65
SWP storage, 1,062,183 af			
O'Neill Forebay	56,400	2,700	12
SWP storage, 29,500 af			
Los Banos Reservoir	34,600	620	12
Little Panoche Reservoir	5,600	190	6
Quail Lake	7,600	290	3
Pyramid Lake	171,200	1,300	21
Elderberry Forebay	32,500	500	7
Castaic Lake	323,700	2,240	29
Silverwood Lake	75,000	980	13
Lake Perris	131,500	2,320	10

## Future Planning and Construction

The planning, design, and construction of SWP facilities were based on studies and analyses that projected SWP water contractor annual water delivery needs. To meet these projected needs, water conservation reservoirs, storage facilities, and delivery facilities were planned to be constructed in stages as demands for water increased. Lake Oroville and San Luis Reservoir were the first SWP conservation reservoir facilities constructed. Additional

facilities were scheduled to meet increased demands. It was anticipated that population growth in delivery service areas and water supply areas of origin would influence the final schedule for SWP facilities. Increasingly, issues such as escalating costs, environmental concerns, and increased non-SWP demand for limited water supplies have become important factors affecting the planning and construction of new facilities.

In response to changes in water management policy, DWR continues to reassess plans for additional facilities that will incorporate increased environmental safeguards, while also increasing SWP delivery yield. Developing these plans involves the time-consuming process of finding technically suitable projects and satisfying many complex and dynamic environmental procedures, laws, and regulations.

For more information about current SWP planning and construction, see Chapter 12, Engineering, Construction, and Real Estate. Information about prior construction activities can be found in previous issues of Bulletin 132.

## Climate Change

Planners are also concerned about climate change and its potentially serious effects on water resources. Temperature increases may affect water demand and aquatic ecosystems. Projected increases in air temperature may lead to changes in the amount, timing, and form of precipitation—rain or snow; changes in the volume and timing of runoff; Delta water quality changes due to sea-level rise; and changes in the amount of irrigation water needed due to modified evapotranspiration rates.

The ability of the SWP and CVP to meet the water demands of their customers and the environment depends on the accumulation of mountain snow and subsequent spring



**Table 1-2 Physical Characteristics of Primary Dams**

Facility	Crest Elevation (feet)	Structural Height (feet)	Crest Length (feet)	Structural Volume (thousand cubic yards)
Antelope	5,025	120	1,320	380
Frenchman	5,607	139	720	537
Grizzly Valley	5,785	132	800	253
Oroville	922	770	6,920	80,000
Thermalito Diversion	233	143	1,300	154
Thermalito Forebay	231	91	15,900	1,840
Thermalito Afterbay	142	39	42,000	5,020
Clifton Court Forebay	14	30	36,500	2,440
Bethany	250	121	3,940	1,400
Del Valle	773	235	880	4,150
Sisk	554	385	18,600	77,645
O'Neill Forebay	233	88	14,350	3,000
Los Banos Detention	384	167	1,370	2,100
Little Panoche Detention	676	152	1,440	1,210
Pyramid	2,606	400	1,090	6,860
Elderberry Forebay	1,550	200	1,990	6,000
Castaic	1,535	425	4,900	46,000
Cedar Springs	3,378	249	2,230	7,600
Perris	1,600	128	11,600	20,000
Crafton Hills	2,932	95	500	144

**Table 1-3 Pumping Plant Characteristics**

Facility	Number of Units	Normal Static Head (feet)	Total Flow at Design Head (cfs)	Total Motor Rating (hp)
Robie Thermalito	3 (p-g) <sup>a</sup>	85-102	9,120	120,000
Hyatt	3 (p-g) <sup>a</sup>	500-625	5,610	519,000
Barker Slough	9	95-120	228	4,800
Cordelia	11	138		
Banks	11	236-252	10,670	333,000
South Bay	9	566	330	27,750
Del Valle	4	0-38	120	1,000
Gianelli	8 (p-g) <sup>a</sup>	99-327	11,000	504,000
Dos Amigos	6	107-125	15,450	240,000
Las Perillas	6	55	461	4,050
Badger Hill	6	151	454	11,750
Devil's Den <sup>b</sup>	6	521	134	10,500
Bluestone <sup>b</sup>	6	484	134	10,500
Polonio Pass <sup>b</sup>	6	533	134	10,500
Buena Vista <sup>b</sup>	10	205	5,405	144,500
Teerink <sup>b</sup>	9	233	5,445	150,000
Chrisman <sup>b</sup>	9	518	4,995	330,000
Edmonston <sup>b</sup>	14	1,926	4,480	1,120,000
Oso	8	231	3,252	93,800
Pearblossom	9	540	2,575	203,200
Greenspot	4	382	50	3,900
Crafton Hills	3	613	40	4,000
Cherry Valley	2	130	75	300

<sup>a</sup>The term p-g indicates pumping-generating units.

<sup>b</sup>These plants have one unit in reserve.

**Table 1-4 Power Plant Characteristics, by Type and Facility**

Type and Facility	Number of Units	Normal Static Head (feet)	Total Flow at Design Head (cfs)	Net Dependable Capacity (MW)	Nameplate Capacity (MW)
<b>Hydro</b>					
Thermalito Diversion Dam	1	63-77	615	3	3
Robie Thermalito	4 (3 p-g) <sup>a</sup>	85-102	17,400	114	114
Hyatt	6 (3 p-g) <sup>a</sup>	410-676	16,950	645	645
Gianelli (total)	8 p-g <sup>a</sup>	99-327	16,960	363	424
Alamo	1	115-141	1,740	15	17
Warne	2	719-739	1,600	67	74
Mojave Siphon	3	81-136	2,880	29	30
Devil Canyon	4	1,406	2,940	235	276
Castaic <sup>d</sup>	7 (6 p-g) <sup>a</sup>	900-1,050	20,820	1,128	1,254
<b>Coal</b>					
Reid Gardner, Unit 4 (total) SWP share of generation <sup>c</sup>	1 <sup>b</sup>			234	275

<sup>a</sup> The term p-g indicates pumping-generating units.

<sup>b</sup> Life of the plants is expected to extend through 2013.

<sup>c</sup> SWP ownership share in Reid Gardner, Unit 4, is 67.8%. In July 2013, DWR ceased to import energy from this coal-fired power plant.

<sup>d</sup> Castaic Pumping-Generating Plant is owned and operated by the Los Angeles Department of Water and Power.

**Table 1-5 Total Miles of Aqueducts**

Facility	Channel and Reservoir	Canal and Siphon	Pipeline and Discharge Line	Tunnel	Total
Grizzly Valley Pipeline	0.0	0.0	6.0	0.0	6.0
Thermalito Power Canal and Tail Channel	1.5	1.9	0.0	0.0	3.4
North Bay Aqueduct	0.0	0.0	27.6	0.0	27.6
South Bay Aqueduct (including Del Valle Branch)	0.3	10.7	31.9	1.7	44.6
<i>Subtotal</i>	<i>1.8</i>	<i>12.6</i>	<i>65.5</i>	<i>1.7</i>	<i>81.6</i>
California Aqueduct					
Clifton Court Forebay to O'Neill Forebay	4.5	61.9	0.3	0.0	66.7
O'Neill Forebay to Kettleman City	4.1	101.4	0.2	0.0	105.7
Kettleman City to Edmonston Pumping Plant	0.0	120.1	0.9	0.0	121.0
Edmonston Pumping Plant to Tehachapi Afterbay	0.0	0.2	1.9	7.9	10.0
Tehachapi Afterbay to Lake Perris	4.0	97.8	34.3	3.9	140.0
<i>Subtotal</i>	<i>12.6</i>	<i>381.4</i>	<i>37.6</i>	<i>11.8</i>	<i>443.4</i>
California Aqueduct Branches					
Coastal Branch	0.0	14.1	98.7	2.7	115.5
West Branch	9.7	9.3	5.8	7.1	31.9
East Branch Extension					
Devil Canyon Powerplant to Greenspot Pump Station	0.0	0.0	16.2	0.0	16.2
Greenspot Pump Station to Noble Creek Terminus	0.0	0.0	16.4	0.0	16.4
<i>Subtotal</i>	<i>9.7</i>	<i>23.4</i>	<i>137.1</i>	<i>9.8</i>	<i>180.0</i>
<b>Total</b>	<b>24.1</b>	<b>417.4</b>	<b>240.2</b>	<b>23.3</b>	<b>705.0</b>

and summer snowmelt runoff. A warming climate may reduce this natural water storage mechanism.

To address these concerns, DWR and Reclamation are coordinating with federal, State, and local agencies and nongovernmental organizations to provide qualitative and quantitative assessments of the potential risks and effects of climate change on California's water resources and update decision makers on climate change impacts, the ability of existing facilities to accommodate these impacts, and available mitigation measures.

In response to changes brought about by population growth, environmental concerns, climate change, and other factors, DWR continues to plan, design, and construct transportation and power-producing facilities for the SWP.

For more information on climate change, see Chapter 3, Environmental Programs.

## Methods of Financing

Project facilities have been constructed with several general types of financing: general obligation bonds and tideland oil revenues (under the Burns-Porter Act, which was approved by the Legislature in 1959, and the bond issue approved by voters in 1960); revenue bonds; and capital resources revenues. Repayment of these funds, and the operations, maintenance, power, and replacement costs associated with water supply, are paid by the 29 agencies and districts that have long-term contracts with DWR for the delivery of SWP water.

## Long-term Contracting Agencies

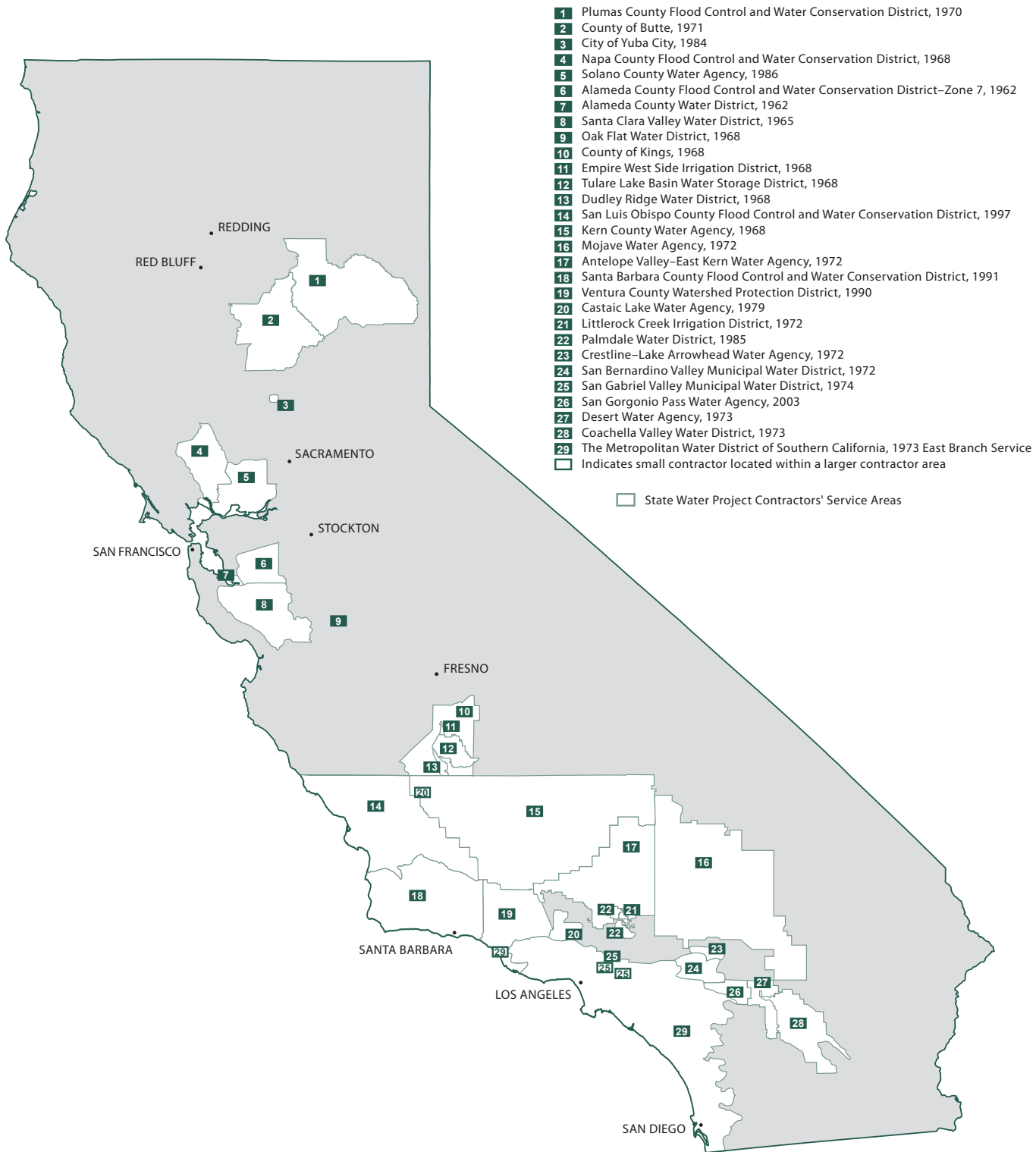
From 1963 through 1967, 32 agencies or districts signed long-term water supply contracts with DWR. However, in 1965,

the City of West Covina was annexed to The Metropolitan Water District of Southern California, and in 1981, Hacienda Water District was assigned to Tulare Lake Basin Water Storage District. On January 1, 1992, Castaic Lake Water Agency assumed all rights and obligations granted to Devil's Den Water District in accordance with its long-term water supply contract. Therefore, only 29 agencies and districts have long-term contracts with DWR as of December 31, 2013.

The contracts initially provided for a combined maximum annual Table A amount of 4,230,000 af of water supply. As a result of contract amendments in the 1980s, and the Monterey Amendment, the current combined maximum annual Table A amount by 2016 totals 4,172,786 af (see Appendix B, Table B-4 for details). The contracts are in effect for the longest of the following periods:

- the project repayment period, which extends to the year 2035;
- 75 years from the date of the contract; or
- the period ending with the latest maturity date of any bond used to finance the construction costs of project facilities.

Figure 1-2 shows the name and location of each contracting agency and district and lists the first year of SWP delivery service for each. Table 1-6 presents more detailed information about each contracting agency.



**Figure 1-2 Names, Locations, and First Year of Service of Long-term Contracting Agencies, December 31, 2013**

**Table 1-6 Long-term Water Supply Contracting Agencies, by Area, as of December 31, 2013**

Contracting Agency	Cumulative Deliveries (af) <sup>a</sup>	Annual Table A (af)	Payments (in dollars) <sup>b</sup>	Gross Area (acres)	Assessed Valuation (in dollars) <sup>b</sup>	Estimated Population
<b>Upper Feather River Area</b>						
City of Yuba City	41,037	9,600	6,793,435	9,377	4,471,569,746	65,841
County of Butte	62,818	27,500	5,957,510	1,049,280	18,070,400,000	204,000
Plumas County Flood Control and WCD	11,701	2,410	2,129,525	1,676,056 <sup>c</sup>	2,060,744,342	21,200
<i>Subtotal</i>	<i>115,556</i>	<i>39,510</i>	<i>14,880,470</i>	<i>2,734,713</i>	<i>24,602,714,088</i>	<i>291,041</i>
<b>North Bay Area</b>						
Napa County Flood Control and WCD	302,871	29,025	116,600,730	510,010	29,745,725,494	139,099
Solano County Water Agency	821,259	47,656	159,346,240	581,760	38,800,000	415,913
<i>Subtotal</i>	<i>1,124,130</i>	<i>76,681</i>	<i>275,946,970</i>	<i>1,091,770</i>	<i>29,784,525,494</i>	<i>555,012</i>
<b>South Bay Area</b>						
Alameda County Flood Control and WCD—Zone 7	1,562,370	80,619	279,338,235	275,900	39,514,000,000	224,000
Alameda County WD	1,277,888	42,000	132,228,545	67,200	46,053,748,000	331,000
Santa Clara Valley WD	4,124,703	100,000	395,598,273	849,000	308,808,219,666	1,853,677
<i>Subtotal</i>	<i>6,964,961</i>	<i>222,619</i>	<i>807,165,053</i>	<i>1,192,100</i>	<i>394,375,967,666</i>	<i>2,408,677</i>
<b>San Joaquin Valley Area</b>						
County of Kings	158,190	9,305	9,770,071	893,300	8,927,709,715	150,479
Castaic Lake Water Agency <sup>i</sup>	419,201	0		8,700 <sup>e</sup>	4,532,936	0
Dudley Ridge WD	2,348,955	50,343	95,553,975	37,600	49,630,000	36
Empire West Side Irrigation District	122,319	3,000	4,730,078	7,400	<sup>d</sup>	11
Kern County Water Agency	36,511,377	982,730	2,124,287,987	5,224,000	92,300,000,000	856,158
Oak Flat WD	211,568	5,700	7,710,453	4,500	<sup>d</sup>	10
Tulare Lake Basin Water Storage District	4,921,955	88,922	184,826,978	189,519	194,000,000	23
<i>Subtotal</i>	<i>44,693,565</i>	<i>1,140,000</i>	<i>2,426,879,542</i>	<i>6,365,019</i>	<i>101,475,872,651</i>	<i>1,006,717</i>
<b>Central Coastal Area</b>						
San Luis Obispo County Flood Control and WCD	75,326	25,000	93,353,246	2,122,240	39,392,490,935	274,804
Santa Barbara County Flood Control and WCD	363,827	45,486	623,814,529	193,391	26,935,170,063	381,562
<i>Subtotal</i>	<i>439,153</i>	<i>70,486</i>	<i>717,167,775</i>	<i>2,315,631</i>	<i>66,327,660,998</i>	<i>656,366</i>
<b>Southern California Area</b>						
Antelope Valley-East Kern Water Agency	2,045,916	141,400	556,986,801	1,845,760	23,393,420,864	312,383
Castaic Lake Water Agency	1,050,938	95,200	350,100,966	124,800	33,600,917,023	275,300
Coachella Valley WD	1,373,561	138,350	499,473,565	639,857	51,440,726,417	303,846
Crestline-Lake Arrowhead Water Agency	59,632	5,800	28,482,590	54,777	2,400,000,000	23,413
Desert Water Agency	1,267,904	55,750	307,487,101	209,760	9,131,339,000	72,000
Littlerock Creek Irrigation District	23,317	2,300	7,094,315	10,000	388,056,000	2,900
The Metropolitan WD of Southern California	35,785,132	1,911,500	11,030,601,366	3,314,737 <sup>f</sup>	2,166,990,306,943	18,379,203
Mojave Water Agency	390,461	82,800	304,439,898	3,136,000	27,400,114,225	464,058
Palmdale WD	273,242	21,300	87,812,610	119,680	1,414,494,581	114,533
San Bernardino Valley Municipal WD	942,802	102,600	651,058,560	225,577	41,521,279,396	661,546
San Gabriel Valley Municipal WD	427,121	28,800	170,640,388	18,297	16,850,589,307	197,636
San Geronio Pass Water Agency	57,662	17,300	155,826,190	140,800	5,708,130,719	78,268
Ventura County Watershed Protection District	68,812	20,000	67,671,562	308,252	25,483,476,833	464,600
<i>Subtotal</i>	<i>73,766,500</i>	<i>2,623,100</i>	<i>14,217,675,912</i>	<i>10,148,297</i>	<i>2,405,722,851,308</i>	<i>21,349,686</i>
<b>Total</b>	<b>97,103,865</b>	<b>4,172,396</b>	<b>18,459,715,722</b>	<b>23,847,530<sup>g</sup></b>	<b>3,022,289,592,205</b>	<b>26,267,499</b>

<sup>a</sup> All water delivered to long-term SWP contractors, including carryover, Article 21, surplus, unscheduled, exchange, permit, purchased, local, and non-SWP water.

<sup>b</sup> Statutes of 1978, Chapter 1207, added Section 135 to the Revenue and Taxation Code, requiring assessment at 100% of full value for the 1981–1982 fiscal year and fiscal years thereafter.

<sup>c</sup> Total of all Plumas County Flood Control and Water Conservation District, including Last Chance Creek Water District.

<sup>d</sup> Assessed valuation not available on an agency area breakdown.

<sup>e</sup> Castaic Lake Water Agency (Southern California Area) includes land in the San Joaquin Valley Area formerly known as Devil's Den Water District.

<sup>f</sup> Total for Metropolitan, including Calleguas Municipal Water District, which is common to Metropolitan and Ventura County Watershed Protection District.

<sup>g</sup> Includes duplicate values. Some areas that are within two or more agencies are included in each agency's total.

<sup>h</sup> Includes all payments pursuant to the repayment provisions of the Water Supply Contracts. Transportation and Conservation Replacement Accounting System payments are also included in this table.





## Chapter 2 Delta Resources

*A greenhouse gas sensor collects data on Sherman Island.*

## Significant Events in 2013

In February 2013, a groundbreaking ceremony was held for the Fish Science Building project at Skinner Fish Facility. Overall, 90 percent of the new facility was completed in 2013.

The *Delta Plan* was adopted by the Delta Stewardship Council (DSC) on May 16, 2013. It became effective with legally enforceable regulations on September 1, 2013.

Full-scale predator sampling and acoustic tagging, avian surveys, and creel surveys for the Clifton Court Forebay fishing facility project began in fall 2013.

*Information for this chapter was contributed by the FloodSAFE Environmental Stewardship and Statewide Resources Office, the Bay-Delta Office, and the Division of Flood Management.*

The Sacramento-San Joaquin Delta is a unique environmental resource and a major source of water for millions of Californians. For more than 60 years, the Department of Water Resources (DWR) and other State and federal agencies have developed and implemented numerous programs to manage the Delta.

## Delta Water Management Programs

Future water deliveries to millions of Californians throughout the State will be affected by many factors, including two significant changes: Delta pumping restrictions and climate change. Ongoing planning activities and regulatory actions continue to influence DWR activities in the Delta. As a result of the efforts associated with the Bay Delta Conservation Plan (BDCP) and the Delta Stewardship Council's (DSC) *Delta Plan*, many of DWR's proposed projects were suspended as staff was redirected to work on the State Water Project (SWP) Delta Compliance Program.

### BDCP

The BDCP is being developed in compliance with the federal Endangered Species Act (ESA) and the California Natural Community Conservation Planning Act. When complete, the BDCP will provide the basis for the issuance of endangered species permits for the operation of the State and federal water projects. The plan will be implemented over the next 50 years. The heart of the BDCP is a long-term conservation strategy that sets forth actions needed for a healthy Delta.

For more information regarding BDCP, see Chapter 3, Environmental Programs.

### Delta Plan

The Delta Reform Act of 2009 requires the DSC to adopt a comprehensive, long-term management plan for the Delta (*Delta Plan*).

(For more information, see the sidebar, Delta Stewardship Council.) Additionally, the Delta Reform Act provides that when the BDCP is completed and successfully permitted, it will be incorporated into the *Delta Plan*.

The *Delta Plan* process went through seven drafts, a draft programmatic environmental impact report, and numerous public meetings and responses to public comments on the drafts.

The *Delta Plan* was adopted by the DSC on May 16, 2013. It became effective with legally enforceable regulations on September 1, 2013.

For more information regarding the *Delta Plan*, visit the DSC's website.

## State Water Project Delta Compliance Program

The SWP and Central Valley Project (CVP) obtained take authorization for ESA and California Endangered Species Act listed species for coordinated operations in the Delta through a U.S. Fish and Wildlife Service biological opinion (BiOp) for Delta Smelt in December 2008, a Department of Fish and Wildlife incidental take permit for Longfin Smelt in February 2009, and a National Marine Fisheries Service (NOAA Fisheries) BiOp for salmon, steelhead, and Green Sturgeon in June 2009. Some of the requirements in these documents were implemented right away, while other requirements needed development of studies and projects before being implemented.

## Delta Stewardship Council

Created by the Legislature under the Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act), the Delta Stewardship Council (DSC) is an independent agency of the State of California composed of members who represent different parts of the State and offer diverse expertise in fields such as agriculture, science, the environment, and public service. Of the seven members, four are appointed by the Governor, one each is appointed by the Senate and Assembly, and the seventh is the Chair of the Delta Protection Commission. The council is the successor to the California Bay-Delta Authority and assumes all of its administrative rights, abilities, obligations, and duties.

The *Delta Plan* was adopted by the DSC on May 16, 2013. It became effective with legally enforceable regulations on September 1, 2013. The *Delta Plan* is a comprehensive, long-term management plan for the Sacramento-San Joaquin Delta. It establishes a set of integrated policies, strategies, and actions to guide State and local agencies to help achieve the coequal goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. It will also guide protection and enhancement of the unique resources, culture, and values of the Delta as an evolving place (California Water Code Section 85054).

The Delta Reform Act specifies eight policy objectives that are “inherent” in the coequal goals (see Water Code Section 85020); a related statewide policy to reduce reliance on the Delta in meeting the State’s future water supply needs through improved regional water self-reliance (Water Code Section 85021); and certain specific subjects and strategies that must be included in the *Delta Plan* (see generally, Water Code Sections 85301–85309).

The Delta Reform Act also established the Delta Science Program and Delta Independent Science Board (ISB) to provide the scientific support and oversight the DSC needs to make decisions based on sound science. Members of both are appointed by the DSC. The Delta Science Program replaces the CALFED Science Program, and the Delta ISB replaces the CALFED ISB.

The Delta Science Program will develop scientific information and synthesis on issues critical for managing the Bay-Delta system. That body of knowledge must be unbiased, relevant, authoritative, integrated across State and federal agencies, and communicated to Bay-Delta decision-makers, agency managers, stakeholders, the scientific community, and the public.

The Delta ISB is a standing board of nationally and internationally prominent scientists with appropriate expertise to evaluate the broad range of scientific programs that support adaptive management of the Delta. The Delta ISB will provide oversight of the scientific research, monitoring, and assessment programs that support adaptive management of the Delta through periodic reviews of each of those programs. The overall objective of Delta ISB oversight is to ensure that the science supporting Bay-Delta programs, the application of that science, and the technical aspects of the Bay-Delta programs are optimally developed and implemented.

In 2013, efforts continued under the SWP Delta Compliance Program to develop studies and projects to address regulatory requirements under the NOAA Fisheries and U.S. Fish and Wildlife Service BiOps and Department of Fish and Wildlife incidental take permit.

## Predation Reduction Efficiency Program

This program includes improving existing fish salvage release sites, developing additional fish salvage release sites, developing a fishing facility and associated predation study for Clifton Court Forebay, and evaluating the screening efficiency of the Skinner Fish Facility to comply with the requirements under the BiOps and incidental take permit. These requirements include:

- reducing prescreen loss of ESA-protected salmon and steelhead in Clifton Court Forebay to no more than 40 percent;
- reducing predation by 50 percent at the fish release sites;
- implementing fish release site studies to develop methods to reduce predation following release of salvaged fish; and
- identifying salvage deficiencies and recommending actions to improve salvage efficiency in order to meet a required efficiency goal of 75 percent for salmonids.

The addition of the Fish Science Building at the Skinner Fish Facility is essential as the current collection, handling, transport, and release building is too small and lacks the necessary equipment to hold and rear the fish to carry out various studies and projects. The building will include a small laboratory, fish rearing tanks, an office, and an area to store study gear and equipment. The Fish Science Building project initiated construction with a groundbreaking ceremony in February 2013. A significant amount of construction was completed during the year, including the foundation,

walls, roof, and water and electrical systems. Overall, 90 percent of the new facility was completed.

## Fish Salvage Release Sites

The predation reduction strategy for the release sites includes designing and constructing the Curtis Landing fish release site with minimal in-water structure to reduce predation and improve survival of released salvaged fish, building two new sites on Sherman Island to increase the time between releases at each site, and coordinating interagency use of release sites.

During 2013, engineering design, review, plans, and specifications were completed for the Curtis Landing fish release site. In addition, all regulatory permits and approvals were obtained, and the project was approved for advertising and construction in 2014. Efforts on the two new sites included identifying the proposed sites, conducting geotechnical investigations, and coordinating with the Central Valley Flood Protection Board and U.S. Army Corps of Engineers (Corps) on levee improvements concerning project levees.

## Fish Screen Evaluations

Fish screens at Barker Slough Pumping Plant, Roaring River Slough Distribution System, and diversions around Sherman Island will be evaluated in order to comply with the requirements of the BiOps and the incidental take permit. The evaluations consist of four components:

- underwater site inspection;
- fish screen cleanliness evaluation;
- fish screen hydraulic evaluation; and
- fish entrainment and impingement evaluation.

These components determine if facility structural components are in sufficient condition to perform as designed; the effectiveness of fish screen cleaning



practices; water approach velocities for various screen cleanliness conditions; and entrainment and impingement for various combinations of fish presence, pumping rates, time of day, and time of year.

During 2013, underwater site inspections for each facility were completed and a pilot year report for the facilities was prepared. Cleanliness and hydraulic monitoring was initiated at each facility along with some small-scale sediment removal at the Roaring River Slough Distribution System. In addition, final fish screen evaluation plans were prepared for each of the facilities along with a draft maintenance report plan and template.

### Ad Hoc Studies

In January 2012, a joint stipulation was filed in the consolidated salmonid cases litigation regarding the 2009 NOAA Fisheries BiOp. The 2012 Stipulation Study was undertaken to gain more information about the effects of CVP and SWP export operations on juvenile steelhead and fall-run Chinook Salmon, gain a better understanding of the effect of Old River and Middle River reverse flows on steelhead route selection and survival in the South Delta, and pilot an approach to manage water export risks to ESA listed salmonids. This study was intended to comply with the requirements of a court settlement agreement that would support evaluation of the BiOp reasonable and prudent alternative Action IV.2.1, limiting south Sacramento-San Joaquin Delta exports during April and May, as a function of San Joaquin River flows. The study was successfully completed and utilized real-time data to inform in-season management and water operations in 2012.

During 2013, a data analysis plan was prepared and approved by an interagency technical team. The analysis was completed and a draft technical report was prepared for review.

Additional information about CVP/SWP operations related to the BiOps can be found in Chapter 3, Environmental Programs.

### Clifton Court Forebay Fishing Facility

The predation reduction strategy in the Clifton Court Forebay is to increase fishing pressure on predators by constructing a fishing pier to provide improved access for anglers that will result in reduced prescreen loss of ESA protected salmon and steelhead in the forebay. During 2013, the final feasibility-level study for the Clifton Court Forebay fishing facility was completed. It identified risks and issues to be addressed during design and construction of the facility. In addition, permitting, environmental documentation, and geotechnical explorations were initiated for the proposed facility. A predator study was also initiated in 2013. The study is designed to gather as much information as possible, pre- and post-installation of the proposed fishing facility, to document the behavior and population demographics of predatory fish and birds and salmonid survival. Pilot-level predator sampling and acoustic tagging, avian surveys, and creel surveys began in the spring. Full-scale predator sampling and acoustic tagging, avian surveys, and creel surveys began in the fall.

### Skinner Fish Facility

The strategy for determining the screening efficiency of the Skinner Fish Facility includes evaluating:

- fish losses through the primary louvers, secondary louvers, and holding tanks;
- hydraulics within the facility;
- the relative abundance of predators within the primary louver channels; and
- fish behavior and movement patterns as they are entrained and guided through the facility.

During 2013, a draft evaluation plan for the Skinner Fish Facility was prepared,

and a technical team was established to evaluate and recommend revisions to the SWP and CVP fish loss equations used at the respective facilities. Other efforts included initiating design activities to improve the debris conveyor and holding tanks and procuring new fish transport buckets.

## Delta Knowledge Improvement Program

In response to Assembly Bill 1200 (2005), which required DWR to provide a risk analysis of the Delta and Suisun Marsh and to develop a set of improvement strategies to manage those risks, DWR created the Delta Risk Management Strategy to look at the sustainability of the Delta and assess major risks to Delta resources from floods, seepage, subsidence, and earthquakes (see Bulletin 132-08 through 132-13).

During the course of the Delta Risk Management Strategy project, a number of information gaps or information quality issues were identified. The limited amount of quality information prompted the creation of the Delta Knowledge Improvement Program, a vehicle to actively fund specific studies to fill the data gaps identified in the Delta Risk Management Strategy.

In 2013, the Delta Knowledge Improvement Program focused on studies to improve State levee investment decisions in the Delta. These studies included:

- an economic study to assist the Delta Stewardship Council develop a comprehensive investment strategy for the Delta levees;
- a feasibility study to assist the Delta Protection Commission make recommendations on how to implement a Delta Flood Risk Management Assessment District;
- an investigation to determine how Delta levees on peat soils respond under seismic loading; and

- development of potential designs of setback levees in the Delta to meet stability requirements while also incorporating desired habitat features.

As part of an effort to update determination of the 100-year water levels in the Delta, the Delta Knowledge Improvement Program funded a data quality analysis of historical water levels reported by gauge stations in the Delta.

More information about the Delta Knowledge Improvement Program is available on DWR's website.

## North Delta Flood Control and Ecosystem Restoration Project

The North Delta Flood Control and Ecosystem Restoration Project (NDFCERP) will provide flood control improvements and ecosystem restoration in the North Delta. The project will implement important flood control improvements in the area of the North Delta where the Mokelumne River, Cosumnes River, Dry Creek, and Morrison Creek converge (see Figure 2-1). Flood flows in the area threaten levees, bridges, and roadways when levees on McCormack-Williamson Tract (MWT) are overtopped and a flood surge occurs. The proposed project will help regulate peak flood flows and prevent flood surges. It will also provide substantial aquatic and terrestrial habitat benefits.

The final NDFCERP environmental impact report was certified in November 2010 and recommended the implementation of the preferred alternative (Alternative 1-A for the Group I actions and the No Action Alternative for the Group II actions [for details see Bulletin 132-11]). The project will create tidal, subtidal, aquatic, and terrestrial habitats benefiting a number of special status species such as Sacramento

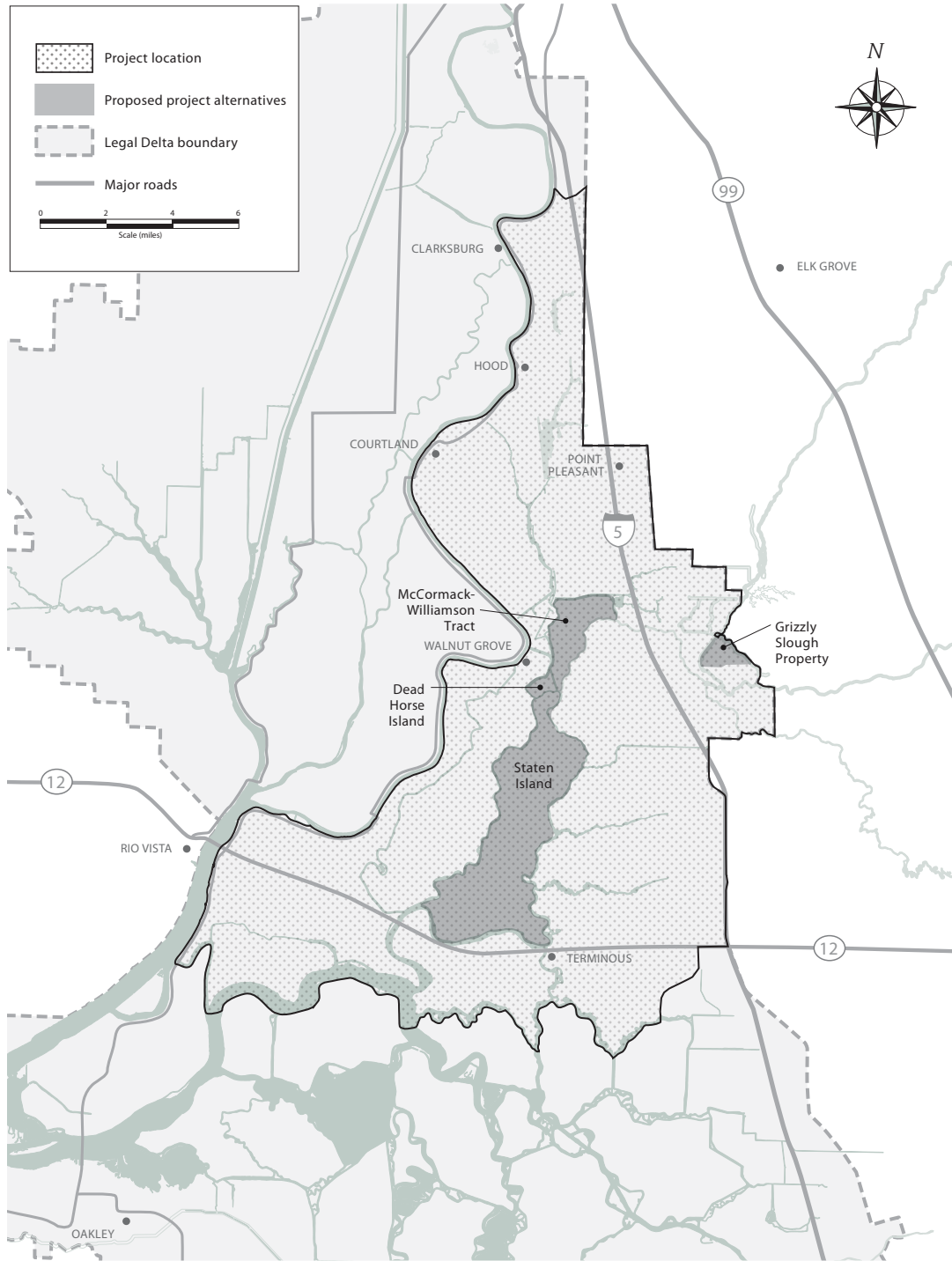


Figure 2-1 North Delta Flood Control and Ecosystem Restoration Project, Project Area

Splittail and Chinook Salmon. The project, as proposed, will provide contiguous habitat and a riparian corridor from the downstream portion of the Cosumnes River Preserve to the Delta.

Two project elements are proposed for implementation over a 6-year timeline: the MWT element combines North Delta flood surge reduction measures with the construction of habitat-friendly levees, floodplain restoration, and the creation of freshwater tidal habitat on MWT. The MWT property, purchased using a CALFED grant, is currently owned and managed by The Nature Conservancy. When completed, the MWT element will result in nearly 1,500 acres of tidal marsh and floodplain restoration, consistent with the objectives put forth in the evolving *Delta Plan* and BDCP. The Grizzly Slough element consists of breaching the Grizzly Slough and Bear Slough levees upstream of MWT to help attenuate peak flood flows and maximize nearly 500 acres of floodplain habitat on the DWR-owned property.

## Project Status

After a federal partnership with the Corps was terminated by Reclamation District 2110 in late 2012, DWR renegotiated an existing agreement with Reclamation District 2110 to complete the project design and permitting process without direct Corps participation. Project planning, permitting, and design work began in 2013 on the reslope features of existing MWT levees to support a phased approach for implementing the project. The State and Federal Contractors Water Agency maintained its interest in the project for potential credit toward meeting the requirements of the BiOps for long-term operations of the CVP and SWP. In early 2013, DWR and the State and Federal Contractors Water Agency completed a Fish Restoration Program Agreement crediting prospectus, and the Fishery Agency Strategy Team determined the project was eligible for Delta Smelt credits under the BiOp.

## South Delta Improvements Program

In 1999, the South Delta facilities became a key component of CALFED.

South Delta Improvements Program (SDIP) elements in the CALFED record of decision included increasing diversions through Clifton Court Forebay (first to 8,500 cubic feet per second [cfs] and then to 10,300 cfs), dredging and installing operable tidal barriers in the South Delta, installing a fish barrier at Head of Old River, and constructing the first phase of a new intake and fish screen in Clifton Court Forebay. SDIP is proposed to be implemented in two component stages.

DWR and the Bureau of Reclamation (Reclamation) identified the following SDIP project objectives and purposes:

- reducing movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via Old River (SDIP Stage 1);
- maintaining adequate water levels and water quality through improved circulation for agricultural diversions in the South Delta, downstream of the Head of Old River (SDIP Stage 1);
- increasing water deliveries and delivery reliability to SWP and CVP water contractors south of the Delta (SDIP Stage 2); and
- providing opportunities to convey water for fish and wildlife purposes by increasing the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay to 8,500 cfs (SDIP Stage 2).

The SDIP Stage 1 physical/structural component includes the following elements:

- constructing and operating a fish-control gate at the Head of Old River to reduce



downstream movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via the Head of Old River;

- constructing and operating up to three flow-control structures (gates) at Middle River (near the confluence of Middle River with Victoria Canal); Grant Line Canal (near the confluence of Grant Line Canal and Old River); and Old River (just east of the Delta-Mendota Canal intake) to improve existing water levels and circulation patterns in South Delta water channels;
- dredging various channels in the South Delta, including Middle and Old rivers, to improve conveyance; and dredging areas surrounding agricultural diversions to improve their function; and
- extending up to 24 agricultural diversion intake facilities to improve their function.

The SDIP final environmental impact report/environmental impact statement (2006) determined the preferred alternative for SDIP Stage 1, which entails installation of permanent control gates to replace the temporary rock barriers currently installed and removed each year under the DWR South Delta Temporary Barriers Project. The preferred alternative also includes the elements of dredging and extending agricultural diversions.

### Preferred Plan

The preferred plan for SDIP is to construct the Stage 1 physical/structural component as soon as permits are obtained and defer the operational component until more is known about the project's potential effects on Delta Smelt and other protected fish species.

DWR deferred both the increase in diversions of up to 10,300 cfs and the associated new fish screens as components of the SDIP due to major funding issues and significant

technical uncertainties associated with the design and construction of the new fish screens.

### Program Status

DWR and Reclamation continued to suspend most SDIP planning and permitting activities during 2013. Some activities were undertaken to address requirements of the 2009 NOAA Fisheries BiOp for the CVP and SWP Long-term Operations Criteria and Plan.

Discussions between DWR and NOAA Fisheries revealed NOAA Fisheries' concern for potential barrier hydraulic disturbances that could promote increased predation on juvenile salmon. DWR conducted a hydrodynamic study focusing on barrier design features to minimize these disturbances. A study report was submitted to NOAA Fisheries in April 2010, which identified several features that could be incorporated into the design.

NOAA Fisheries stated an interest to delay further discussions on the SDIP until completion of an ongoing, multiyear South Delta Temporary Barriers Project predation study. The study is being conducted to satisfy requirements of the 2008 NOAA Fisheries BiOp for the project and is examining the occurrence of predation associated with the project. The study's field data collection was completed in 2011, and data analysis is in progress. Data from the study will be useful in considering permanent barrier design options and operation strategies to minimize predation.

For additional information about SDIP, see Chapter 7, Water Supply Development and Reliability.

### Temporary Barriers Project Facilities

The South Delta Temporary Barriers Project is an ongoing project that installs up to four rock barriers in channels located in the southern portion of the Sacramento-San



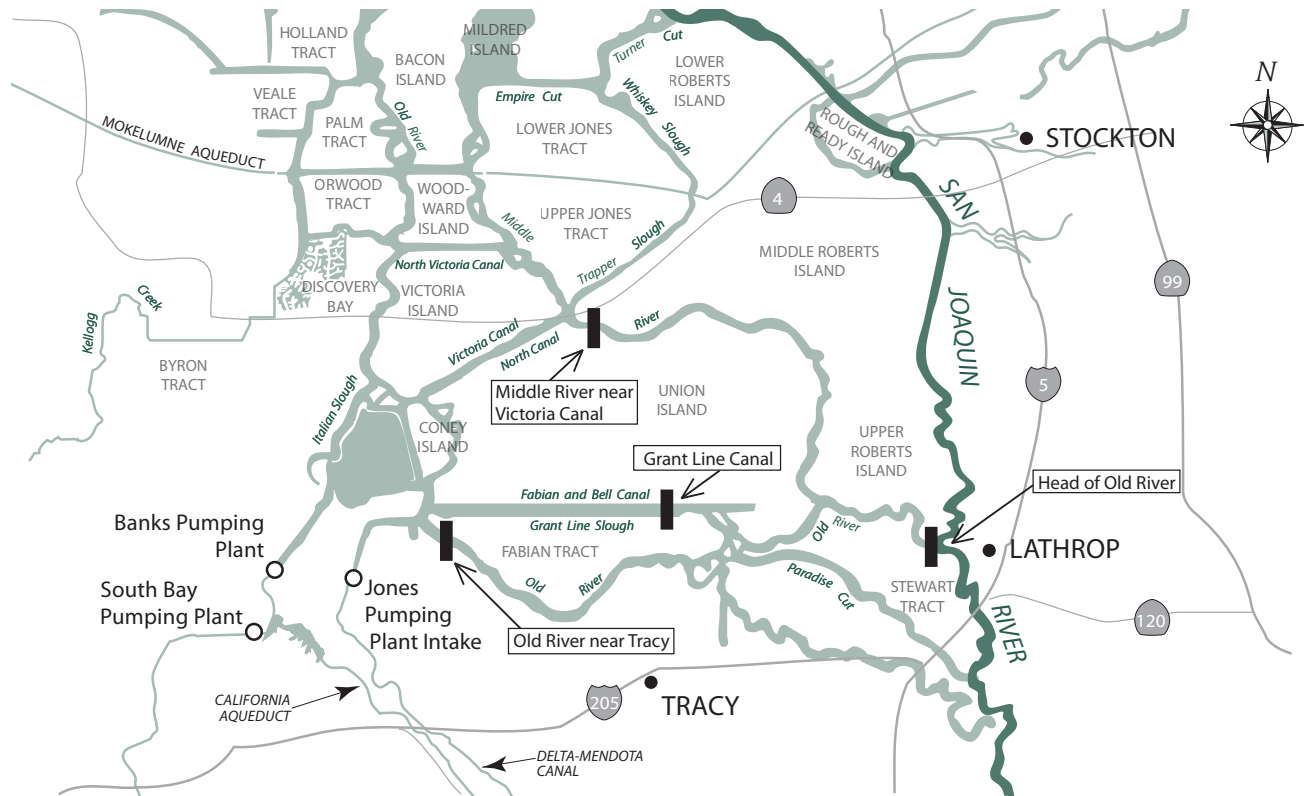
Joaquin Delta near the cities of Tracy and Lathrop in San Joaquin County. The barriers are installed during the irrigation season from April to November at four sites (see Figure 2-2), as follows:

- (1) Head of Old River, in Old River where it splits from the San Joaquin River;
- (2) Old River near Tracy, one-half mile east of the Jones Pumping Plant intake and about 8 miles northwest of Tracy;
- (3) Middle River near Victoria Canal, just southeast of the confluence of Middle River, Trapper Slough, and North Canal; and
- (4) Grant Line Canal, 420 feet east of the Tracy Boulevard Bridge.

The Old River near Tracy, Middle River near Victoria Canal, and Grant Line Canal rock barriers are designed to act as flow-control structures to improve water levels and

circulation within the South Delta. The Head of Old River barrier is designed to improve migration conditions for Central Valley fall-run Chinook Salmon in the spring and fall. In the spring, the barrier blocks juvenile salmon migratory movements into Old River from the San Joaquin River. In the fall, the barrier increases the volume of San Joaquin River flow passing downstream through the Port of Stockton and improves dissolved oxygen levels in the San Joaquin River. As a result, it improves the low dissolved oxygen sag that occurs near that area and aids adult salmon upstream migration in the San Joaquin River basin.

In 2013, the three flow-control agricultural barriers at Middle River near Victoria Canal, Grant Line Canal, and Old River near Tracy were installed and operated as planned. The installation took place in May, and the barriers were removed in November. Additionally, the option of raising the Middle



**Figure 2-2 Temporary Barrier Locations in the South Delta**

River barrier by 1 foot to increase water level and improve circulation was exercised in June.

The spring Head of Old River rock barrier was not installed in 2013 due to a management decision. Instead, existing data collected from previous years was analyzed so the information could be applied to future barrier installation.

Despite the absence of the spring rock barrier at the Head of Old River in 2013, Head of Old River fish monitoring was implemented to study predatory fish distribution and abundance in the vicinity of the Head of Old River. The coordinated acoustic telemetry studies were conducted by Reclamation and the U.S. Fish and Wildlife Service to track the movements of salmon smolts, steelhead, and predatory fish to determine outmigrating salmon smolt survival and to learn more about predatory fish behavior.

In 2013, the fall Head of Old River rock barrier was not installed due to an adequate presence of dissolved oxygen in the Stockton Deep Water Ship Channel and because it was not requested by the Department of Fish and Wildlife.

Data collected in 2013 is being analyzed, and the findings of the studies will be published in a comprehensive report.

Information on the temporary barriers, including details about barrier operations, can be found on DWR's website.

## Delta Flood Control

Levees in the Sacramento-San Joaquin Delta protect valuable wildlife habitat, farms, homes, urban areas, recreational developments, highways, railroads, natural gas infrastructure, utility lines, a major aqueduct, and other public developments. Delta levees influence and protect critical

water quality parameters in Delta waterways. Some levees also protect water quality for approximately 27 million Californians who receive a portion of their water from the Delta. The State Legislature recognized the importance of the Delta and enacted the Delta Flood Protection Act of 1988, declaring that “. . . the Delta is endowed with many invaluable and unique resources and that these resources are of major statewide significance” (Senate Bill 34 [Water Code Sections 12300 et seq. and 12980 et seq.]).

Since 1988, the Delta Levees Program has provided more than \$310 million in State-appropriated funds. These monies are combined with local cost-share funding to provide flood protection and environmental benefits in the Delta.

In Senate Bill 34, the Legislature declared its intent to appropriate \$6 million for local assistance under the Delta Levee Maintenance Subventions Program and \$6 million for Delta Levees Special Flood Control Projects, including subsidence studies and monitoring on Bethel, Bradford, Jersey, Sherman, and Twitchell islands; Holland, Hotchkiss, and Webb tracts; and the towns of Thornton and Walnut Grove.

In 1996, Assembly Bill 360 expanded the area covered by the Delta Levees Program to include the remainder of the legal Delta and northern Suisun Bay.

Additional funding sources for the Delta Levees Program include:

- Proposition 204 enacted in 1996 (\$25 million);
- Proposition 13 enacted in 2000 (\$30 million);
- Proposition 50 enacted in 2002 (\$70 million);
- Proposition 84 enacted in 2006 (\$275 million);
- Proposition 1E enacted in 2006; and
- Proposition 1 to be enacted in 2014.

## Delta Flood Emergency Preparedness, Response, and Recovery Program

The Delta Flood Emergency Preparedness, Response, and Recovery Program is a part of the FloodSAFE California Initiative. The FloodSAFE initiative was developed by DWR in response to the passing of the Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E). The program is designed to enhance emergency preparedness and enable DWR to better coordinate with its local partners to respond to and recover from a large-scale Delta flood emergency.

The draft *Delta Flood Emergency Management Plan* presents DWR's concept of operations for flood emergency response in the Delta. The plan describes the roles and responsibilities of DWR's emergency response organizations, including the Flood Operations Center, the Project Operations Center, and the Department Operations Center, and lists DWR's actions during flood emergency response. It also supports DWR's emergency preparedness efforts in the Delta and guides DWR management in making critical decisions during recovery.

For more information, visit DWR's website.

## Delta Levees Maintenance Subventions Program

The Delta Levees Maintenance Subventions Program (Subventions Program) is a cost-share program that provides technical and financial assistance to local levee-maintaining agencies in the Sacramento-San Joaquin Delta for the maintenance and rehabilitation of Delta levees. The Subventions Program is authorized by California Water Code Sections 12980 through 12995 and is managed by DWR. The Central Valley Flood Protection Board reviews and approves DWR's recommendations and enters into

agreements with local agencies to reimburse eligible costs for levee maintenance and rehabilitation.

The Subventions Program provides funding to local levee-maintaining agencies for improving, maintaining, and enhancing nearly 700 miles of project and nonproject levees. Since its inception in 1973, the Subventions Program has provided more than \$160 million of State funding to more than 70 islands in the Sacramento-San Joaquin Delta. In fiscal year 2013–2014, the program reimbursed approximately \$8 million to local agencies for eligible levee maintenance and rehabilitation activities. These activities helped minimize the risk of Delta levee failure, which in turn protects the Delta's ecosystem, communities, and agriculture; State and private infrastructure; and the State's water supply.

## Delta Special Flood Control Projects Program

The Delta Special Flood Control Projects Program is authorized by California Water Code Sections 12310 through 12318. The program assists eligible local agencies in the Delta with flood protection and levee stability repairs. In 1990, the California Water Commission approved actions and priorities that serve as a guide for DWR to determine the best use of appropriations to protect Delta islands. Long-term actions and priorities include:

- rehabilitating threatened levees through the beneficial reuse of dredged material;
- verifying elevations in the Delta through the use of global positioning system equipment and light detection and ranging;
- upgrading levees to the standards included in Bulletin 192-82 (Delta Levees Investigation); and
- considering projects to achieve net long-term habitat improvement for fish and wildlife.

While DWR seeks cost sharing for all projects, the actual reimbursement depends on each reclamation district's ability to pay. DWR may provide up to 100 percent of the cost. Districts receiving these funds are required to participate in a habitat improvement program to ensure net long-term habitat enhancement.

Levee restoration projects, habitat projects, and other special projects were conducted on various Delta islands and tracts in 2013–2014. Also undertaken during the year were levee improvements on Jersey and Bradford islands to support temporary emergency drought barriers (if required) as part of DWR's drought response.

### Model Bulk Credits Program

In order to more effectively meet reclamation district habitat mitigation obligations resulting from the Delta Levees Subventions and Special Flood Control Projects local assistance, the programs established a model Bulk Credits Program in 2012. Mitigation credits were purchased in advance from an existing mitigation bank. These credits provide more biologically effective mitigation than past practices of establishing less formal, smaller mitigation sites, and are a much more efficient way of meeting mitigation obligations. The bulk purchase of credits from the mitigation bank was made at a substantial discount.

In 2013, the Bulk Credits Program became widely accepted by participating reclamation districts, with virtually all mitigation taking place through the program. Additionally, the program commenced investigations for building a custom mitigation site for future needs, targeting DWR lands on Twitchell Island.

### Reuse of Dredged Material for Delta Levees

As local sources of fill material for levee repair are depleted, new economical

sources must be located. DWR has worked to find opportunities to reuse clean, dredged material in the Sacramento-San Joaquin Delta.

As part of this effort, a charter for the multiagency Delta Long-Term Management Strategy (LTMS) for the beneficial reuse of dredged material became effective in February 2007. The LTMS is designed to improve operational efficiency and coordination of collective and individual agency decision-making responsibilities, resulting in approved dredging and dredged material management actions in the Delta, including the beneficial reuse of such material. Regular LTMS meetings have included representatives from DWR, the Corps, the U.S. Environmental Protection Agency, the Regional Water Quality Control Board, the Ports of Stockton and West Sacramento, and other interested parties.

Delta LTMS long-term goals include:

- developing a streamlined permitting process for dredging and dredged material reuse;
- developing a consolidated guidance document addressing sampling, tests, protocols, and methods for assessing sediment and dredged material characterization;
- developing a sediment management plan of methodologies for assessing and characterizing sediments and determining appropriate disposal options;
- developing a programmatic biological assessment for sensitive Delta species;
- drafting a programmatic environmental impact report/environmental impact statement for the Delta LTMS; and
- identifying and permitting additional sediment placement and beneficial reuse sites in the Delta.

The San Francisco Bay LTMS Management Plan calls for periodic review and/or



modification of the program to ensure that it remains achievable and current in light of changing conditions over time. The LTMS agencies conduct a thorough analysis of the program every 6 years. In 2012, the LTMS agencies completed a comprehensive 12-year review of the program, and the final report for the 12-year review was issued in August 2013.

## West Delta Program

The West Delta Program is charged with managing the lands on Sherman and Twitchell islands to achieve DWR's goals and objectives, including understanding and managing methods that will mitigate subsidence. These program objectives are supported by active research and application of land management activities used for subsidence reversal, carbon sequestration, and habitat development.

Over the past 15 years, DWR has been working with various researchers to:

- understand what causes subsidence;
- develop best management practices to stop subsidence; and
- determine greenhouse gas (GHG) benefits of wetland crops in the Delta.

Currently, it is known that: (1) subsidence can be halted by shallow flooding of the organic soil to stop its aerobic decomposition; (2) organic soils can be re-established by growing marsh plants; and (3) a developing carbon market will pay to sequester carbon. The potential to grow marsh plants and sequester carbon offers the Delta a unique opportunity to take advantage of the combination of conditions to increase elevation on subsided lands, restore a large portion of the Delta to marsh and wetlands, and receive compensation for taking land out of traditional agriculture.

In 2013, the West Delta Program initiated a multi-agency effort to develop a draft GHG

protocol that will be considered for adoption by the California Air Resources Board in late 2015 or early 2016. This protocol will allow for quantification of a project's net increase in carbon sequestration and will consider GHG emissions from the converted agricultural land to calculate a project's net GHG benefit. The protocol has a modular format providing flexibility for different types of wetland projects that have varying rates of carbon sequestration, different baseline conditions, and varying GHG emissions.

Additionally, the West Delta Program expanded its partnership with the University of California, Berkeley, to begin analyzing GHG emissions from farming activities in the Delta. This data, along with data collected on wetland crops, will be used to develop and calibrate models for GHG sequestration estimates necessary for the GHG protocol.

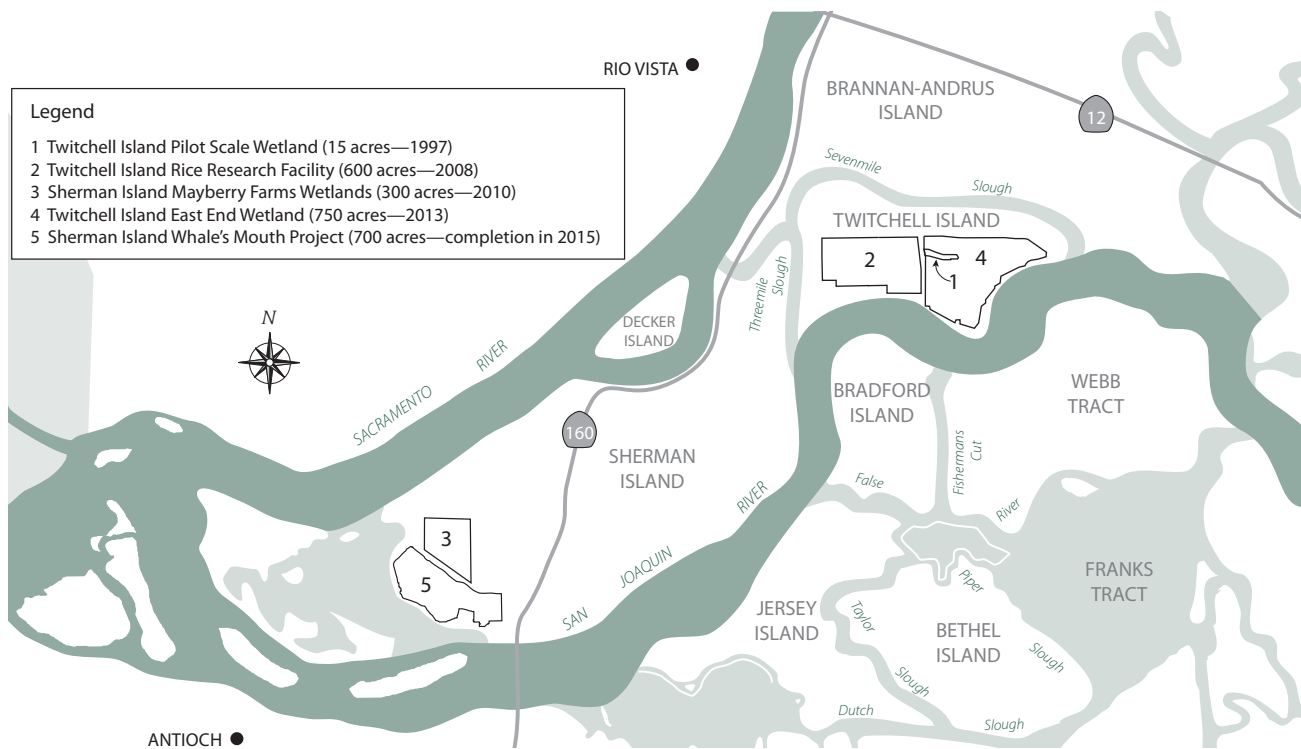
The West Delta Program also completed construction of a 750-acre wetland on the east end of Twitchell Island (see Figure 2-3). Features include more than 8 miles of berms needed to terrace the land into cells for appropriate water depth, approximately 30 water-control structures, and a pump station allowing on-island seepage and agricultural drainage to be used as irrigation water for the project.

Planning and design was initiated for a habitat restoration project on the southwest portion of Sherman Island. This project, known as the Whale's Mouth Project (see Figure 2-3), includes filling in a scour pond that threatens levee stability and converting the area to upland habitat, while creating approximately 600 acres of wetlands in the adjacent pasture. The project is scheduled to be completed during the summer of 2015.

## Delta Agricultural Water Agencies

In 1974, the Delta Water Agency was replaced by six Delta agricultural water





**Figure 2-3 Selected West Delta Program Projects**

agencies: North Delta Water Agency, South Delta Water Agency, Central Delta Water Agency, Contra Costa County Water Agency, East Contra Costa Irrigation District, and Byron-Bethany Irrigation District. In 1981, North Delta Water Agency and East Contra Costa Irrigation District signed water rights management contracts with DWR. DWR negotiated contracts and requested negotiations with other agencies to provide water level, circulation, and quality needs in certain areas.

### South Delta Water Agency Contract

In September 1990, DWR completed negotiations for a long-term agreement with South Delta Water Agency and Reclamation. Under the South Delta Water Agency contract, the parties agreed to proceed with the design, construction, and operation of certain barrier facilities in the South Delta channels. These facilities resolved portions of the lawsuit that South Delta Water Agency

filed in 1982 regarding the alleged effects of export pumping by the SWP and CVP on water levels, quality, and circulation in the South Delta.

DWR has installed and operated temporary barrier facilities in the South Delta to improve area conditions, and collect data needed to design and operate permanent barrier facilities. Ongoing efforts are being made to improve water levels, circulation, and quality in South Delta channels. These efforts have included modifying and dredging around local diverters' intakes, conducting a series of computer modeling studies, and modifying barrier flap gate operations.

In June 2013, DWR raised the Middle River weir by 1 foot to increase the water level and to improve circulation in certain areas upstream of the barrier.

## Western Delta Municipal Water Users

DWR signed contracts with Contra Costa Water District in 1967 and the City of Antioch in 1968. These contracts compensate Contra Costa and Antioch for purchasing water of usable quality when such water is not available from Mallard Slough and the San Joaquin River.

According to the contracts, DWR compensates each agency for the additional costs of purchasing a substitute water supply from the Contra Costa Canal. This water is purchased to replace water supplies of usable quality that are lost due to SWP operations. Credits for the number of days of above-average water supplies of usable quality, from Mallard Slough and the San Joaquin River, accrue to offset the number of below-average days in future years.





## **Chapter 3**

# **Environmental Programs**

*Juvenile Chinook Salmon (Oncorhynchus tshawytscha).*

## Significant Events in 2013

On April 9, 2013, a court order extended the deadlines for completion of new U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NOAA Fisheries) biological opinions (BiOps) for Central Valley Project (CVP) and State Water Project (SWP) long-term operations. The new deadlines are December 1, 2014, and February 1, 2017, respectively.

On December 13, 2013, the draft Bay Delta Conservation Plan (BDCP) and its associated environmental impact report (EIR)/environmental impact statement (EIS) were released for public comment. The 9,000-page public draft BDCP and its corresponding 25,000-page EIR/EIS underwent significant revisions since the informal release of the second administrative draft earlier in 2013. A significant change to the proposed tunnels was announced in August 2013.

In December 2013, quagga mussels were discovered in Lake Piru in Ventura County. Due to the possibility for mussels to be introduced to Pyramid and Castaic lakes from Lake Piru, monitoring efforts were immediately increased at Pyramid and Castaic lakes. All additional samples were negative for quagga mussels.

*Information in this chapter was contributed by the Division of Environmental Services, the Division of Operations and Maintenance, the Division of Integrated Regional Water Management, and the State Water Project Analysis Office.*



The Department of Water Resources (DWR) has developed and implemented several programs to avoid, minimize, and/or offset adverse environmental impacts resulting from construction and operation of State Water Project (SWP) facilities.

## Operations for Species of Concern

A primary consideration in the operation of the SWP is avoiding, minimizing, and/or offsetting adverse impacts to species of concern, species listed as threatened or endangered by a State or federal agency, or species proposed for listing. The SWP is operated pursuant to biological opinions (BiOps) issued under the federal Endangered Species Act (ESA), and consistency determinations or incidental take permits issued under the California Endangered Species Act (CESA). A key to avoiding and minimizing adverse impacts to these species is maintaining flexibility in SWP operations. Operational responses can include Delta Cross Channel gate closure, export curtailments, changes in delivery schedules, increased reservoir releases, preferential use of certain facilities, or a combination of these actions.

Additional information can be found in Chapter 7, Water Supply Development and Reliability.

## San Joaquin River Restoration Program

The San Joaquin River Restoration Program is a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of the Merced River and restore a self-sustaining Chinook Salmon fishery in the river, while reducing or avoiding adverse water supply impacts from restoration flows.

In early 2013, the Department of Fish and Wildlife (DFW) began operating the Interim

San Joaquin Salmon Conservation and Research Facility for the San Joaquin River Restoration Program. This facility will allow for the development and maintenance of a genetically diverse brood stock of spring-run Chinook Salmon for eventual release into the San Joaquin River. This interim facility will be operated and maintained until the full-scale conservation facility is constructed and operating. The draft environmental impact report (EIR) for the proposed Salmon Conservation and Research Facility was released for public review in October 2013.

Planning, environmental compliance, and design efforts for the Mendota Pool Bypass and Reach 2B Channel Improvements Project and the Reach 4B, Eastside Bypass, and Mariposa Bypass Channel and Structural Improvements Project continued to move forward.

The fourth and final year of interim San Joaquin River flows ended on December 31, 2013. Under the water management goal, approximately 90,000 acre-feet of these interim flows were recaptured and recirculated by the end of the water contract year (March 2013 through February 2014).

More information is available on San Joaquin River Restoration Program's website.

## Lower Yuba River Accord

The Lower Yuba River Accord's purpose is to resolve instream flow issues and protect and enhance lower Yuba River fisheries and local water supply reliability. The Lower Yuba River Accord provides revenues for local flood control and water supply projects, water to enhance SWP and Central

Valley Project (CVP) water supply reliability by offsetting Delta export reductions for protection and restoration of Delta fisheries, and improvements in statewide water supply management, including dry year supplies for participating SWP and CVP contractors.

Water contracted by DWR under the Lower Yuba River Accord (Component 1 water) continues to be used to help offset Delta export reductions to benefit fish. In 2013, Yuba County Water Agency delivered 60,000 acre-feet of Component 1 water provided to DWR under the 2007 DWR/ Yuba County Water Agency Water Purchase Agreement. Under an agreement signed in 2012, DWR and the Bureau of Reclamation (Reclamation) equally share Component 1 water made available from 2012 through 2015.

For more information about the Lower Yuba River Accord, see Chapter 9, Water Contracts and Deliveries.

## Oroville Facilities

### Existing Federal Energy Regulatory Commission License Activities

#### Invasive Plant Management

During 2013, DWR removed all red sesbania (*Sesbania punicea*) along the Thermalito Power Canal, Thermalito Forebay, and Thermalito Diversion Pool as part of annual maintenance started by the Department of Parks and Recreation in 2007. DWR took over in 2008 and will continue until red sesbania is eradicated in these areas. The Thermalito Power Canal, Forebay, and Diversion Pool are the upstream extent of the red sesbania population on the Feather River. Also, *Dittrichia graveolens* (stinkwort) was observed in many new locations. This species wasn't a concern until 2011, but was much more widespread in 2013. Stinkwort plants were hand-pulled at several locations, and DWR is looking into other management options.

DWR also partners with other agencies to remove invasive plants within areas of joint management. In 2013, DWR partnered with the Butte County Agricultural Commissioner to treat skeleton weed (*Chondrilla juncea*) and red sesbania. Butte County has been annually treating skeleton weed near McCabe Creek at Lake Oroville and near Ponderosa Reservoir. There are several stands of red sesbania that are adjacent to the Thermalito Power Canal and Thermalito Forebay, but not within the DWR boundary that Butte County treats.

#### Feather River Fish Hatchery

In 2013, a total of 7,045,310 juvenile fall-run Chinook Salmon (*Oncorhynchus tshawytscha*) were released into the Delta, the Sacramento River, and the San Francisco and San Pablo bays.

Also in 2013, a total of 2,159,091 spring-run Chinook Salmon were released: 1,033,174 in San Pablo Bay and 1,125,917 in the Feather River. Additionally, 377,536 steelhead were planted in the Feather River at Boyd's Pump Boat Launch.

#### Lake Oroville and Thermalito Afterbay

Beginning in 2013, Coho Salmon (*Oncorhynchus kisutch*) were not stocked in Lake Oroville. The Coho Salmon stocking totals, dating back to 2002 when DWR began this program, are shown in Table 3-1.

**Table 3-1 Numbers and Sizes of Coho Salmon Stocked in Lake Oroville by DWR, 2002–2012**

Year	Fingerlings	Yearlings	Adults	Total
2002	50,249	128,280		178,529
2003	39,222	133,570		172,792
2004				
2005		58,802		58,802
2006		249,827	1,299	251,126
2007		133,758		133,758
2008	363,800			363,800
2009		256,542		256,542
2010		184,415		
2011		229,400		229,400
2012	79,600	211,600		291,200
Total	532,871	1,586,194	1,299	1,935,949

The revised stocking plan will continue with Chinook Salmon. In May 2013, 91,788 Chinook Salmon were stocked in the lake. The salmon were stocked at the advanced fingerling size in May instead of growing them out to the yearling size for stocking in the fall. This was the result of an anticipated maintenance project that was to occur at the Feather River Fish Hatchery (FRFH) during summer 2013, when the 40-year-old, 60-inch diameter raw water intake line for the FRFH was scheduled for inspection. In order to inspect and repair the pipeline, the FRFH needs to be shut down and dewatered. This was supposed to occur in July 2013, but was postponed until 2014.

Also in 2013, 11,000 FRFH surplus steelhead were planted in Thermalito Afterbay.

### **Oroville Wildlife Area**

Revegetation and weed removal activities continued during 2013 at two newly established wetland ponds in the Oroville Wildlife Area. These wetland ponds were created as mitigation required in a 1995 U.S. Army Corps of Engineers Clean Water Act Section 404 permit for a project that constructed two waterfowl brood ponds at the Thermalito Afterbay. The wetland ponds project converted a 20-acre area of low quality, disturbed, upland habitat into 10 acres of emergent wetland and 10 acres of riparian habitat. The waterfowl brood ponds were a requirement of the revised recreation plan that was part of the Federal Energy Regulatory Commission's (FERC) September 22, 1994, order.

Also during 2013, DWR installed a water temperature gauge in the Oroville Wildlife Area at the downstream FERC project boundary (near Gridley). The data can be accessed in 15-minute intervals at the California Data Exchange Center website (Station ID: FOW).

### **Oroville State Recreation Area**

The Brad B. Freeman Bike Trail Realignment Project was completed in 2013. The project realigned and improved approximately 0.85 miles of the existing trail along the east bank of the Thermalito Diversion Pool and the Fish Barrier Dam pool.

### **Lake Oroville Elevation**

A number of aspects of the Oroville Facilities can be affected by lake surface elevation including:

- habitat;
- flora and fauna of the lakeshore area and upstream tributaries;
- recreation;
- water quality;
- water temperature;
- shoreline and lakebed stability and erosion;
- flood storage capacity;
- power generation; and
- streamflow requirements (downstream of the lake).

The 2013 low point for the Lake Oroville reservoir elevation was reached on December 31 at 704.1 feet, and the annual high point of 871.8 feet was reached on April 23. The full pool elevation of Lake Oroville is approximately 900 feet.

### **Federal Energy Regulatory Commission Relicensing Activities**

Various conservation measures for the species identified in the U.S. Fish and Wildlife Service (USFWS) 2007 BiOp for the Oroville Facilities relicensing project continued to be implemented on SWP lands. Monitoring associated with these measures includes an annual vernal pool survey (645 mapped vernal pools and/or features); protective measures for elderberry shrubs (*Sambucus* species, host plant for the valley elderberry longhorn beetle

[*Desmocerus californicus dimorphus*]); and annual monitoring of nesting Bald Eagles (*Haliaeetus leucocephalus*) in the area (five currently active nests). In addition, habitat management activities within the Oroville Wildlife Area are coordinated through DFW staff. These activities include providing nest and forage habitat for waterfowl and upland bird species, monitoring and maintaining Thermalito Afterbay brood pond water surface elevations, and protecting and conserving Giant Garter Snake (*Thamnophis gigas*) habitat. An annual compliance report for 2013 was compiled by DWR and submitted to USFWS.

For more information about Oroville Facilities relicensing, see Chapter 10, Power Resources.

## Invasive Species

### Quagga and Zebra Mussel Monitoring and Assessment

The quagga mussel, *Dreissena rostriformis bugensis*, and the zebra mussel, *D. polymorpha*, are invasive freshwater mussels that pose a significant threat to the SWP. Both species attach to hard substrates, including other mussels, with strong byssal threads, forming dense colonies and causing significant biofouling impacts to raw water infrastructure by clogging small diameter piping and filters and encrusting trash racks and fish screens.

In early 2007, the quagga mussel was detected in the lower Colorado River and spread throughout connected water diversion systems (see Bulletin 132-08). The following year, the zebra mussel was detected in San Justo Reservoir in San Benito County, adding to the existing threat. In response, DWR formed the Aquatic Nuisance Species Program within the Division of Operations and Maintenance. The program includes applied studies, early detection monitoring, vector management,

rapid response planning, long-term mussel management, and public outreach.

### Applied Studies

**Assessment of Habitat Suitability.** DWR's consultant, RNT Consulting Inc. (see Bulletin 132-11), examined the suitability of the SWP to support long-term populations of quagga and zebra mussels (dreissenids) if unintentionally introduced. Based on the results, locations in the SWP were classified into one of three groups: unable to support, potentially able to support, or able to support long-term populations of dreissenid mussels (see Bulletin 132-12). Understanding where dreissenid mussels may survive in the SWP will be used to prioritize management efforts.

### Development of Control Methods.

RNT Consulting Inc. conducted bench-top chemical mussel control trials in mobile flow-through laboratories at San Justo Reservoir and at Davis Dam on the Colorado River. The chemicals tested included several copper-based algaecides, peroxide, sodium carbonate peroxyhydrate, and two endothall herbicide formulations (see Bulletin 132-13). The results are under analysis and are anticipated to be available in 2014.

**Early Detection Monitoring.** DWR routinely monitors the California Aqueduct, SWP reservoirs, and the Sacramento-San Joaquin Delta for the presence of quagga and zebra mussels. DWR uses three different methods to monitor for mussels: zooplankton tows (with DNA analysis) for veligers; settlement plates (see Bulletin 132-10); and bioboxes for adults (attached/settled stage).

In 2013, DWR and two collaborating water agencies, Santa Clara Valley Water District and The Metropolitan Water District of Southern California, collected veliger samples at 16 locations (see Bulletin 132-10). In addition, DWR staff are trained in quagga and zebra mussel identification, and are instructed to look for mussels during



regular field work and during routine facility maintenance activities. No mussels were detected in the SWP, the Delta, or other SWP source water during 2013.

### ***Prevention and Response Planning***

To protect and prepare the SWP against mussels, Aquatic Nuisance Species Program staff developed several planning documents to guide actions and identify vulnerabilities. The *Quagga and Zebra Mussel Vector Management Plan for the State Water Project* identifies potential mussel points-of-entry and vectors, and outlines mechanisms to reduce the risk of introduction. The two primary vectors of mussels are downstream transport of planktonic veligers in natural and constructed waterways and overland transport of veligers and attached adults on watercraft. A critical component of the vector management plan is reducing the risk posed by watercraft. To accomplish this, DWR contracted with the California Department of Parks and Recreation and the Los Angeles County Department of Parks and Recreation to implement vessel inspection and outreach programs at San Luis State Recreation Area (San Luis Reservoir, O'Neill Forebay, and Los Banos Creek Reservoir) and Pyramid and Castaic lakes (see Bulletin 132-12).

At San Luis State Recreation Area, a total of 11,911 vessels were inspected during 2013. Of those vessels, 277 failed the inspection due to the presence of wet equipment or standing water and were not allowed to launch. At Castaic Lake, a total of 10,212 vessels were inspected, and 256 failed the inspection. At Pyramid Lake, 6,062 vessels were inspected, with 229 failures. No mussels were found during the inspections.

In December 2013, quagga mussels were discovered in Lake Piru, operated by United Water Conservation District, in Ventura County. Lake Piru is in close proximity to

Pyramid and Castaic lakes and participated in a "reciprocal banding" program with Pyramid and Castaic. This means that vessels that passed inspection at any of the three lakes and received a "clean vessel" band could subsequently launch at any of the three lakes without undergoing additional inspection. Between September 1 and December 18, 2013, 265 boats were allowed to bypass inspections and launch directly into Pyramid and Castaic lakes after visiting Lake Piru. The practice of honoring Lake Piru inspections was immediately discontinued once DWR was notified of the discovery of quagga mussels.

Sampling for veligers had been routinely conducted at Pyramid and Castaic lakes since 2008, and all samples had been negative. Due to the possibility that mussels were introduced to Pyramid and Castaic lakes from Lake Piru, monitoring efforts were immediately increased. Additional sampling for veligers was conducted, and additional settlement plates were deployed. All additional samples were negative for quagga mussels. Continued increased sampling is planned for 2014 to ensure that Pyramid and Castaic lakes are not infested.

In the event mussels are detected in the SWP, the *Quagga and Zebra Mussel Rapid Response Plan for the State Water Project* outlines a course of action to confirm the sighting; delineate the population; implement containment and eradication measures; and notify State and federal partner agencies, the SWP water contractors, and any potentially impacted entities.

With uncontrolled watercraft access to and from infested bodies of water, such as the Colorado River, the SWP and the Delta remain vulnerable to mussel infestation. Therefore, DWR is preparing a long-term mussel management plan that identifies facility vulnerabilities and outlines both short-term and long-term options to prevent or mitigate mussel biofouling impacts for all



at-risk SWP facilities. The short-term control strategies are those that can be implemented within a few weeks to a few months time and may be temporary in nature, such as shutdowns for power washing and shell removal. The long-term control strategies have longer implementation times (6 months to multiple years) and are permanent in nature (alterations to infrastructure).

RNT Consulting Inc. is assisting DWR with plan preparation. The first phase of the project focused on Southern Field Division facilities, as RNT Consulting Inc. determined that all facilities located downstream of Check 41 are at the highest risk of mussel establishment. RNT Consulting Inc. and DWR Aquatic Nuisance Species Program staff conducted facility site visits, focusing on raw water infrastructure, and determined the areas vulnerable to mussel biofouling. The report for Southern Field Division facilities was completed in September 2012. The report for the Delta, San Luis, and San Joaquin field divisions was completed in December 2013. As a follow up to the management plan reports, RNT Consulting Inc. will develop cost estimates for facility retrofit implementation.

## The Bay Delta Conservation Plan

In 2013, State and federal agencies continued their collaborative efforts to refine and complete the analyses and documentation necessary to finalize a public draft of the Bay Delta Conservation Plan (BDCP) and the corresponding EIR/ environmental impact statement (EIS). Preliminary administrative drafts of both documents were released to the public in the spring.

In August 2013, DWR announced changes to the proposed water conveyance tunnels. These changes included decreasing the intermediate forebay from 750 to 40 acres

and realigning a segment of the tunnels to the east to shift construction impacts from private to public lands. The purpose of these changes was to reduce the effects of the project on Delta residents. In total, the proposed August 2013 changes would decrease the permanent water conveyance project footprint from 3,654 acres to 1,851 acres.

On December 13, 2013, the draft BDCP and its associated EIR/EIS were released for public comment. The 9,000-page public draft BDCP and its corresponding 25,000-page EIR/EIS underwent significant revisions since the informal release of the second administrative draft earlier in 2013. Some revisions included changes to the alignment of the proposed water conveyance tunnels, more detail about the adaptive management process, refinement and revision of how the plan would be governed, additional design criteria and operational constraints for the proposed north Delta intakes, and additional measures to protect the Greater Sandhill Crane (*Grus canadensis tabida*), Giant Garter Snake, and Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*).

The public comment period was expected to last 120 days from the release date. Citizens, organizations, and government agencies were urged to review and comment on the documents.

## Effects Analysis Review Continued

Because the BDCP will alter the physical and biological environment of the Delta, it includes an effects analysis to describe predicted effects on biological performance, particularly with regard to covered species' population levels. The effects analysis will be the foundation for the biological assessment and subsequent BiOp issued by the federal agencies. It is a systematic, scientific look at both potential impacts and potential benefits from conservation actions.

In 2013, an independent science review panel, convened by the Delta Stewardship Council in 2011, continued to assess the scientific quality of the effects analysis. This third and final phase of the effects analysis review effort will culminate in a final report summarizing the panel's comments on the effects analysis. The report is expected to be completed and released in the winter of 2014.

## Environmental Surveys

DWR continued conducting wetland field surveys using the California Rapid Assessment Method to evaluate the condition of wetlands as part of an ongoing effort to collect environmental data for the Delta Habitat Conservation and Conveyance Program, a program focused on engineering and associated with the BDCP. DWR also continued conducting wetland delineations to assess wetland impacts in the project footprint and develop a jurisdictional determination to be approved by the U.S. Army Corps of Engineers.

## Geotechnical Monitoring

DWR's geotechnical monitoring for the BDCP was put on hold until the record of decision/notice of determination is complete.

## Biological Opinions Issued on CVP/SWP Operations

The National Marine Fisheries Service (NOAA Fisheries) and USFWS have both issued BiOps on CVP and SWP operations that include reasonable and prudent alternatives (RPAs) to avoid jeopardy of federally listed species. Both BiOps have been remanded by the federal court.

In December 2012 and March 2013, a joint motion for an extension of the remand schedule was filed with the court. The remand process is allowing DWR, DFW, Reclamation, USFWS, and NOAA Fisheries

to undertake a collaborative adaptive management approach to interim operations under the existing BiOps; enabling a more efficient and focused evaluation of RPAs; allowing joint completion of new BiOps and the associated National Environmental Policy Act (NEPA) process; and testing the type of science program proposed under the BDCP.

On April 9, 2013, a 1-year extension (with the potential for two additional 1-year extensions) was granted by the U.S. District Court for the Eastern District of California. The extension was based on the development of the Collaborative Science and Adaptive Management Program. The program was formed in May 2013 to produce information developed through a collaborative science process that is directly relevant to management actions in the Delta and can be used to manage operations in a way that protect fish while providing for greater water supply reliability. The court order required a joint status report to be submitted by February 15, 2014.

The Delta Science Program conducted the 2013 Long-term Operations Biological Opinions Annual Science Review in November.

## USFWS Biological Opinion

The jeopardy conclusion of the 2008 USFWS BiOp was upheld based on federal court findings that fish entrainment at the pumping facilities will adversely affect Delta Smelt (*Hypomesus transpacificus*). However, because the science supporting flow prescriptions in the BiOp was questioned, and the economic and technical feasibility of the RPAs was not considered, the BiOp was remanded (March 2011). The court set a deadline for development of a new Delta Smelt BiOp, RPAs, and NEPA review by Reclamation to be completed by December 1, 2013. The April 9, 2013, court order sets a new deadline of December 1, 2014.

## NOAA Fisheries Biological Opinion

The 2009 NOAA Fisheries BiOp was amended in 2011 with updates to the RPAs including improvements to real-time operations and data collection, as well as clarification of specific actions.

In September 2011, a federal court upheld the jeopardy conclusion of the 2009 NOAA Fisheries BiOp, but found that the RPAs were not adequately justified or supported by the record. The court directed a remand of the BiOp. In December 2011, the court ordered that a new draft BiOp be transmitted by October 1, 2014, and a final BiOp by

February 1, 2016. The April 9, 2013, court order extended the deadline for the new BiOp to February 1, 2017.

## EIS for the Remanded Biological Opinions

Reclamation initiated a combined NEPA process for both BiOps. An EIS will be prepared with Reclamation as the lead agency and DWR as a cooperating agency. The deadline for the EIS coincides with the court-ordered deadlines for the BiOps. The scoping process was completed in 2012, and the scoping report was published in February 2013.

## Endangered Species and Biological Opinions

An endangered species is one in danger of extinction in all or a significant portion of its range; a threatened species is one likely to become endangered. The Endangered Species Act (ESA) and the California Endangered Species Act (CESA) are designed to protect threatened and endangered species by ensuring federal and State agencies adopt measures to protect the species during the design, construction, and operation of projects, or for other forms of agency action, and prohibit the unauthorized take of endangered species. Biological opinions and incidental take permits are issued to protect ESA- and CESA-listed species.

ESA Section 7 requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species or modify their critical habitat, otherwise formal consultation is required. Federal agencies must consult with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service (the wildlife agencies). As part of the consultation process, the wildlife agency issues a biological opinion which states the agency's determination of whether the action is likely to jeopardize a species or adversely modify critical habitat. If the wildlife agency determines an action will jeopardize or adversely modify, it will suggest reasonable and prudent alternatives that the "action agency" may take to avoid the likely jeopardy or adverse modification (Title 16, United States Code Sections 1531–1544 [1973]).

CESA is substantially similar to ESA in all aspects (California Fish and Game Code Sections 2050–2098 [1984]). Under CESA, an incidental take permit issued by the Department of Fish and Wildlife can allow for the take of State-listed species if specific criteria are met, including measures to minimize and mitigate the impacts of authorized take (California Code of Regulations, Title 14, Sections 783.0–783.8).

With DWR's assistance, Reclamation began developing alternatives for the EIS (including the no action alternative and second basis of comparison) with a placeholder for a sixth alternative based on the proposed action being developed for the biological assessment. All work proceeded in order to complete the EIS by the new court-ordered deadlines.

## Delta Operations for Delta Smelt and Longfin Smelt

The Smelt Working Group (an interagency team of experts on Delta Smelt and Longfin Smelt [*Spirinchus thaleichthys*] biology) meets regularly from December through June to assess the risk to Delta Smelt and Longfin Smelt from CVP and SWP export facilities. Based on near real-time technical information, such as fish distribution, salvage, and physical water conditions, the Smelt Working Group makes recommendations on export operations to the USFWS and DFW with the goal of reducing entrainment of the two species.

Recommendations are based on guidelines outlined in the 2008 USFWS BiOp and the 2009 DFW Longfin Smelt incidental take permit (see Bulletins 132-11 and 132-12).

The Smelt Working Group made several recommendations to alter export operations during the 2012–2013 water year, due to early flow and turbidity pulses and elevated levels of Delta Smelt salvage. Beginning in early December and continuing through mid-January, Delta Smelt salvage at the export facilities approached the concern level specified in the 2008 BiOp. Based on working group recommendations, the USFWS issued 13 determinations from December 2012 through March 2013, requiring that exports did not produce average Old and Middle river flows more negative than specified amounts. Restrictions ranged from flows no more negative than -1,250 cubic feet per second, to flows no more negative

than -5,000 cubic feet per second. From April 8 to June 30, the Smelt Working Group determined that operations following the minimum protections of the 2008 USFWS BiOp (e.g., -5,000 cubic feet per second) were sufficiently protective and did not recommend further reductions to operations.

## Fish Restoration Program

Pursuant to the USFWS and NOAA Fisheries BiOps and the DFW Longfin Smelt incidental take permit (see Bulletin 132-11), the Fish Restoration Program (FRP) has continued to make progress towards fulfilling its restoration requirements.

In February 2013, the *Stakeholder Assessment Summary* and *Communications & Engagement Plan* were completed and made available on the FRP website.

Stakeholder outreach in 2013 included 25 meetings with stakeholders, individuals, and public agencies. Efforts have been made to keep those stakeholders who will be most affected by the Prospect Island restoration project apprised of DWR's proposed restoration design alternatives. The FRP has been diligent in keeping other Delta stakeholders updated with the program's purpose and engaging in early consultation with regulatory agencies.

Interim land management of Prospect Island continued in 2013. DWR established legal access, and a levee inspection in March 2013 along Miner Slough revealed sites that need to be repaired or at least monitored for further deterioration. The FRP and Division of Engineering staff worked to enable the more urgent repairs to be made during the 2014 work window allowed under the Prospect Island streambed alteration agreement. A mitigated negative declaration and necessary permit applications are expected in early 2014.



The summary report for the October 2012 Delta Regional Ecosystem Restoration Implementation Plan, Prospect Island workshop was released in February 2013. The report included recommendations of alternative design options for further consideration and environmental documentation. Early consultation with the U.S. Army Corps of Engineers led to the exclusion of restoration alternatives with breaches in the Deep Water Ship Channel. The FRP continued to work with its consulting team on more detailed modeling and evaluation of restoration design. Final alternatives to be evaluated in the EIR will be chosen in 2014.

On May 17, 2013, DWR released a notice of preparation for the Prospect Island Tidal Habitat Restoration Project. A public scoping meeting was held on June 10, 2013. Written and verbal comments on the notice of preparation were compiled into an FRP stakeholder database, and a California Environmental Quality Act (CEQA) scoping report was produced (available on the FRP website under the Prospect Island project link). These comments will be incorporated into the public draft EIR, which is expected to be released in early 2015.

The FRP provided funds for the Battle Creek Salmon and Steelhead Restoration Project in 2011 and 2012 (see Bulletin 132-13). DWR continued to work with NOAA Fisheries in 2013 to demonstrate that DWR has fully complied with RPA Action I.2.6. NOAA Fisheries responded in a letter dated May 6, 2013, that it does not agree that compliance has been met. DWR’s Office of the Chief Counsel is considering this matter.

DWR purchased the 245-acre Overlook Club property in February 2013 for tidal habitat restoration under the FRP. The Overlook Club (Property 322) is one of three properties on Bradmoor Island, located within the Nurse Slough Complex of Suisun Marsh in Solano County. Interim management in 2013 included repair of a levee breach caused by beaver damage. Restoration goals and objectives were developed, and DWR staff began working with consultants to develop models for evaluating design alternatives.

## Decisions on Endangered Species

Table 3-2 lists fish species of concern found in the Delta. No status changes were made in 2013.

**Table 3-2 Special Status Delta Fish Species**

Common Name	Scientific Name	Date of Listing or Action	
		ESA	CESA
Delta Smelt	<i>Hypomesus transpacificus</i>	threatened <sup>a</sup> (4/5/1993)	endangered (1/20/2010)
Longfin Smelt	<i>Spirinchus thaleichthys</i>	candidate <sup>b</sup> (4/2/2012)	threatened (4/9/2010)
Chinook Salmon (winter-run)	<i>Oncorhynchus tshawytscha</i>	endangered (2/3/1994)	endangered (9/22/1989)
Chinook Salmon (spring-run)	<i>Oncorhynchus tshawytscha</i>	threatened (11/15/1999)	threatened (2/5/1999)
Chinook Salmon (fall/late fall-run)	<i>Oncorhynchus tshawytscha</i>	species of concern (4/15/2004)	none
steelhead (Central Valley DPS)	<i>Oncorhynchus mykiss</i>	threatened (5/18/1998)	none
Green Sturgeon (Southern DPS)	<i>Acipenser medirostris</i>	threatened (6/6/2006)	none

ESA = federal Endangered Species Act; CESA = California Endangered Species Act; DPS = distinct population segment

<sup>a</sup> In April 2010, the USFWS found that reclassification of Delta Smelt from threatened to endangered was warranted but precluded by other higher priority listing actions.

<sup>b</sup> On April 2, 2012, the USFWS found that listing the San Francisco Bay-Delta DPS as threatened or endangered was warranted but precluded by other higher priority listing actions and has added the San Francisco Bay-Delta DPS of Longfin Smelt to its list of candidate species.



## Trends in Fish Abundance

Abundance indices for Longfin Smelt and Delta Smelt are based on DFW fall midwater trawl sampling conducted every year from September through December. Index calculations are based on average catch per trawl for 100 core index stations, which are partitioned into 14 geographic areas. The average monthly catch per tow in each area is multiplied by a weighting factor that is based on the estimated volume of water in each area. The resulting values are then summed over all areas and months to obtain the annual index. This fall abundance index serves as an indicator for adult Longfin and Delta Smelt populations over a relatively long period of time.

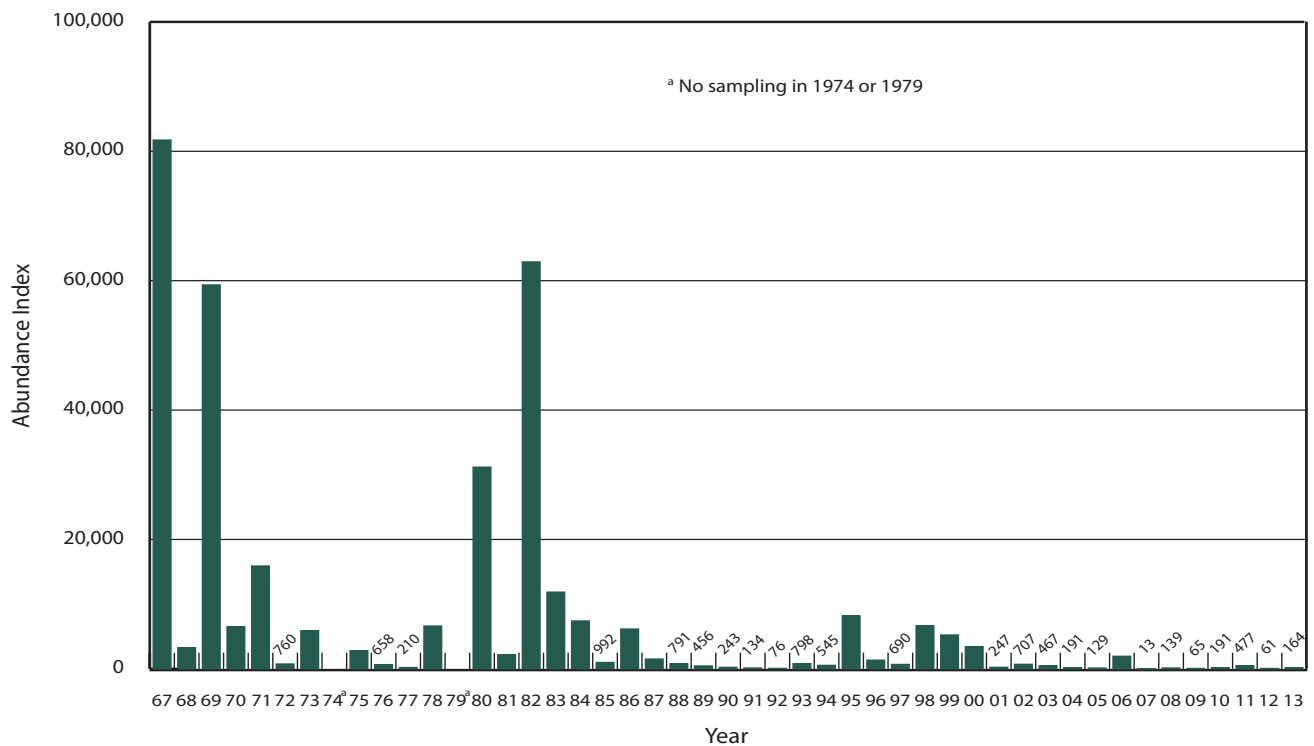
The abundance index for Longfin Smelt from 1967 through 2013 is shown on Figure 3-1. Values for 2013 rose slightly over the previous year, but remained similar

to the very low levels observed over the last decade.

Figure 3-2 shows the abundance index for Delta Smelt from 1967 through 2013. After a brief rise in 2011, the index dropped back down in 2012 to levels consistent with the persistently low indices observed from 2002–2010. This trend continued in 2013, with the index dropping further to the second lowest level on record.

For more about the declining abundance of Delta Smelt and other pelagic fish species in the Delta, see the Pelagic Organism Decline section in this chapter.

Figure 3-3 shows estimates of returning adult winter-run Chinook Salmon from 1970 through 2013. These estimates, referred to as escapement estimates, are the number of adults that escape mortality and return to spawn. The Sacramento River winter-run Chinook Salmon escapement estimates



**Figure 3-1 Longfin Smelt Fall Midwater Trawl Abundance Index, 1967–2013**

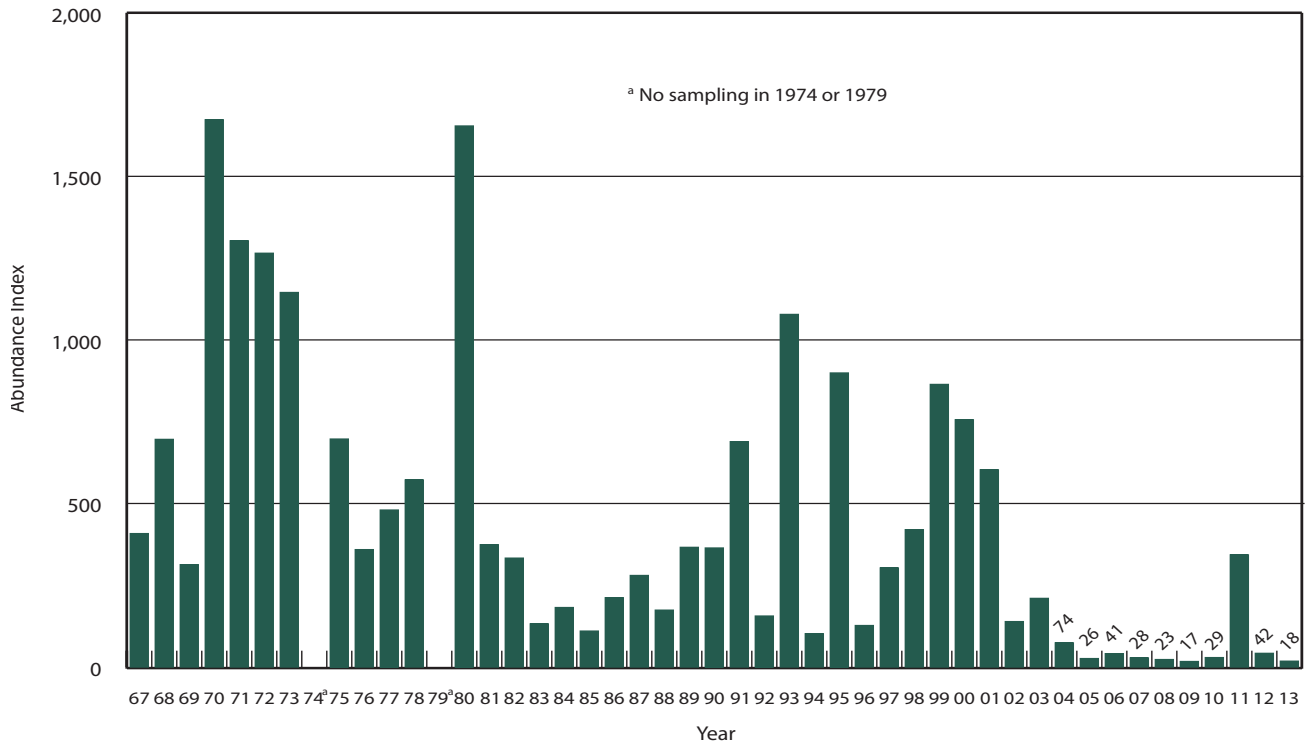


Figure 3-2 Delta Smelt Fall Midwater Trawl Abundance Index, 1967–2013

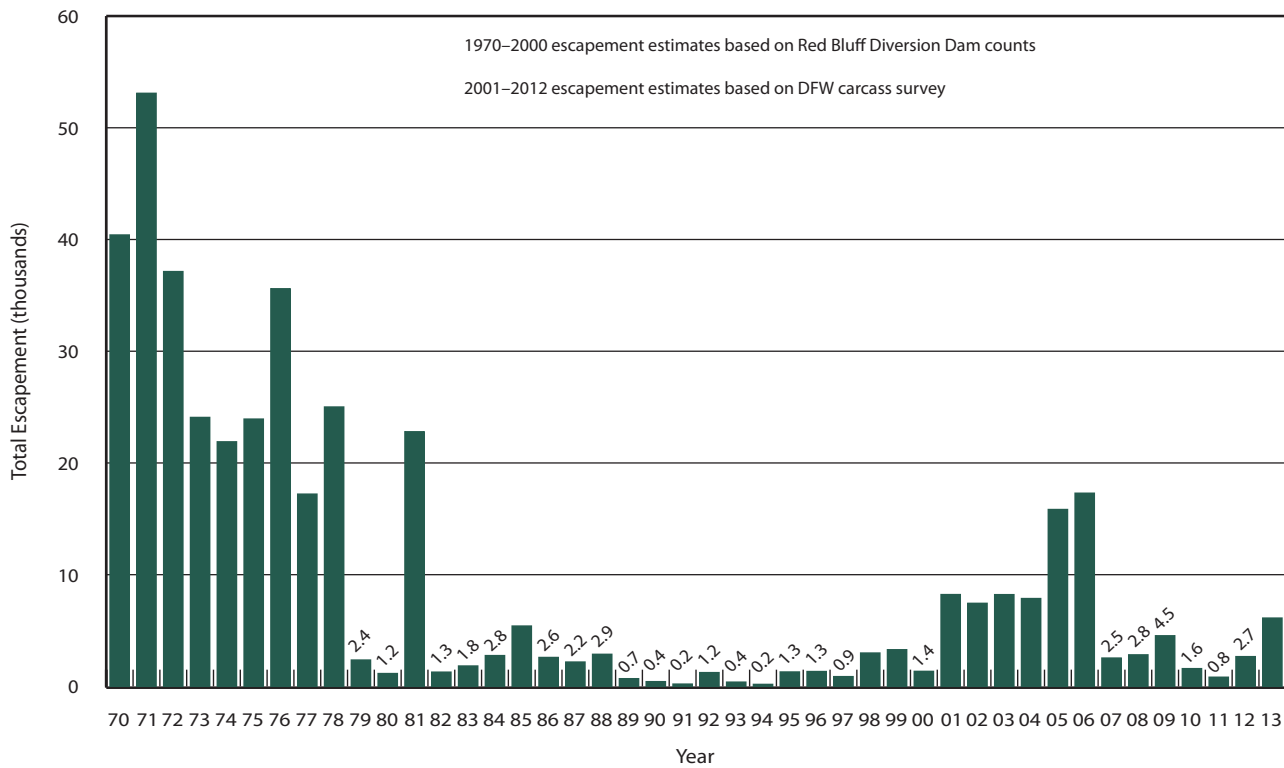


Figure 3-3 Estimated Total Adult Winter-run Chinook Salmon Escapement, 1970–2013

are generated using data from the DFW carcass survey. DFW has been using the carcass survey data to generate escapement estimates since 2001, prior to which Red Bluff Diversion Dam counts were used. The estimated winter-run Chinook Salmon escapement for 2013 was 6,123, which was more than two times higher than in 2012, but lower than values observed from 2001 to 2006.

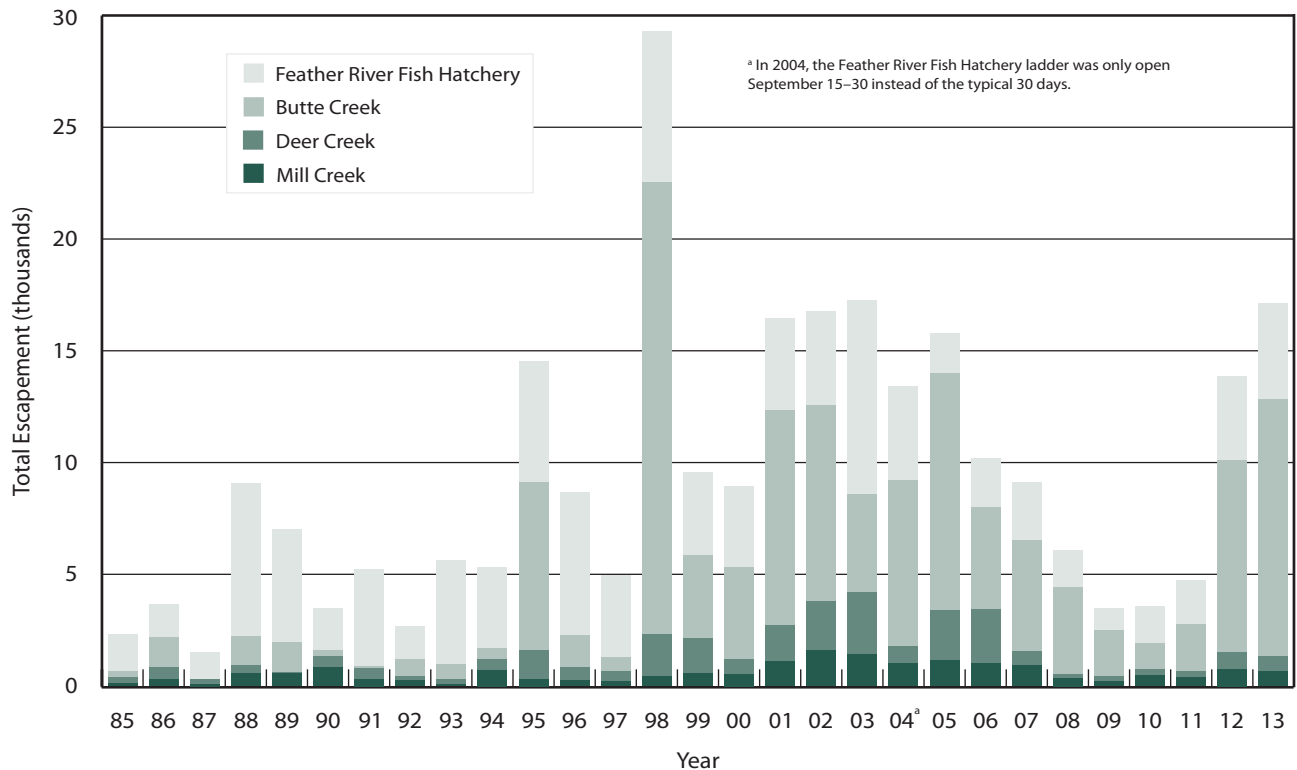
Figure 3-4 shows estimates of returning adult spring-run Chinook Salmon from 1985 through 2013. Individual estimates are shown for FRFH and the principal spring-run spawning streams: Mill Creek, Deer Creek, and Butte Creek. The escapement estimates are shown separately for each stream, because the Feather River estimate is based on returns to the FRFH, where the genetic integrity of spring-run Chinook Salmon is uncertain. The estimated escapement for 2013 was 4,294 for FRFH and 12,822 for the other streams combined. The 2013

escapement estimate was 2.5 times higher than the 2010 parent stock estimate for the FRFH, and seven times higher than the 2010 parent stock estimate for naturally spawned fish in Mill, Deer, and Butte creeks.

Due to the lack of comprehensive monitoring programs, there are no reliable escapement estimates for wild Central Valley steelhead.

## Pelagic Organism Decline in the Upper San Francisco Estuary

By the early 2000s, long-term monitoring by the Interagency Ecological Program (IEP) revealed marked declines in numerous pelagic (open water) fish species in the upper San Francisco Estuary (the Delta and Suisun Bay). This decline has collectively become known as pelagic organism decline.



**Figure 3-4** Estimated Total Adult Spring-run Chinook Salmon Escapement, 1985–2013

Pelagic fish species in decline include Delta Smelt, Longfin Smelt, Striped Bass (*Morone saxatilis*), and Threadfin Shad (*Dorosoma petenense*). These declines resulted in significant management consequences, including limits on SWP and CVP pumping operations for the protection of Delta Smelt (listed as threatened under ESA and endangered under CESA) and Longfin Smelt (listed as threatened under CESA).

Since 2005, IEP scientists have been coordinating studies investigating potential causes of pelagic organism decline. In 2010, an “ecosystem regime shift” conceptual model was put forward, hypothesizing that pelagic organism decline was caused by changes to multiple and interacting environmental variables, such as outflow, turbidity, and salinity, which led to fundamental changes to the Delta ecosystem (see the IEP *Pelagic Organism Decline Work Plan and Synthesis of Results*, available on DWR’s website). This conceptual model has served as a working hypothesis for continuing pelagic organism decline investigations since 2011. In early 2012, the IEP formed the Management, Analysis, and Synthesis Team to synthesize scientific datasets with the goal of addressing pressing management information needs.

During 2013, the team continued to evaluate possible drivers for the Delta Smelt population increase in 2011, and evaluate how the Delta Smelt population responds to varying environmental conditions. In addition, the Management, Analysis, and Synthesis Team and the IEP identified priority information gaps to guide future research projects, which included studies that elucidate fish population dynamics, fish distribution and health, and population effects of the food webs and water diversions.

## Feather River Fish Studies

In the early 1990s, the Feather River fish studies were initiated to document and monitor fish populations in the lower Feather River. Early efforts focused on studies to identify flow requirements for Chinook Salmon and steelhead. The program, initiated in the mid-1990s in preparation for the Federal Energy Regulatory Commission relicensing of the Oroville Facilities, has progressively expanded to also satisfy requirements in the NOAA Fisheries BiOp for long-term operations of the CVP and SWP. Field program elements, including operation of rotary screw traps (RSTs), salmon and steelhead spawning surveys, salmon escapement surveys, and snorkel surveys, have expanded to include acoustic and radio telemetry, otolith thermal marking studies, spring-run Chinook Salmon tagging for hatchery broodstock collection, and Green Sturgeon studies.

The study area is generally divided into the low-flow channel, from the Fish Barrier Dam downstream to the Thermalito Afterbay Outlet, and the high-flow channel, from the Thermalito Afterbay Outlet downstream to the confluence with the Sacramento River at Verona (see Figure 3-5).

### Rotary Screw Traps

RSTs capture juvenile salmon and steelhead as they emigrate from the Feather River. Over the last several years, DWR has used RSTs as the primary method to assess the general abundance and timing of emigrating juvenile salmon and steelhead in the lower Feather River. In addition, large numbers of naturally produced (wild) salmon have been coded wire tagged in an effort to examine their return success. This long-term monitoring yields valuable baseline information about juvenile salmonid production in the lower Feather River and the effects of project operations on abundance and migration timing.

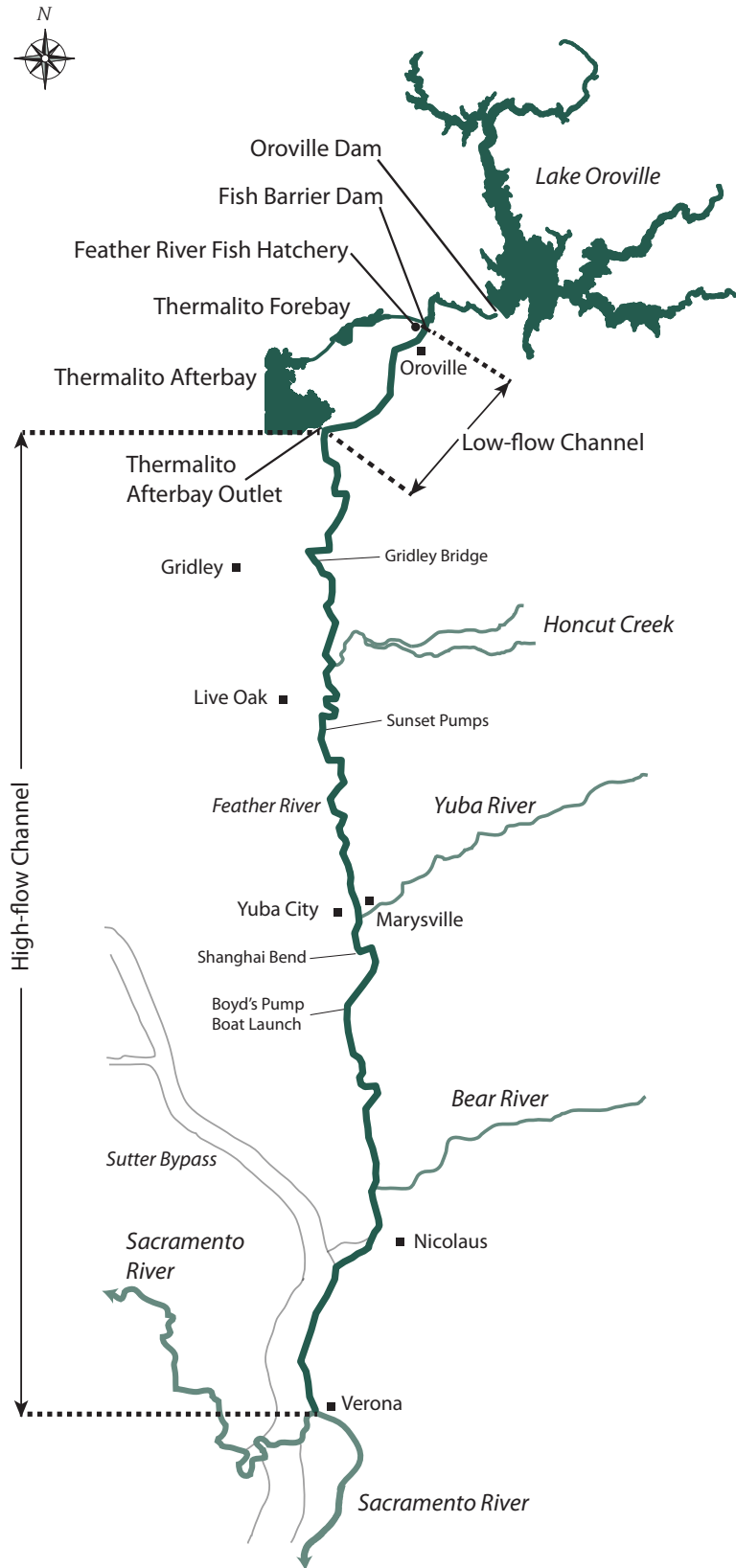


Figure 3-5 The Lower Feather River



Emigration timing and speed measurements confirm that most wild juvenile Chinook Salmon move rapidly through the upper reaches of the lower Feather River.

Consistent with select years of trapping data, turbidity may influence the emigration timing of wild juvenile salmon. However, other studies demonstrate that the timing of adult spawning probably plays a large role in determining juvenile salmon emigration patterns as well.

In 2013, the RSTs fished throughout the emigration period (December through May). Two RST locations were used to assess the timing and general abundance of juvenile Chinook Salmon, steelhead, and other fishes emigrating in the lower Feather River. Within the low-flow channel, one RST (Gateway Riffle) was stationed at River Mile (RM) 59.5, approximately 0.5 miles above Thermalito Afterbay Outlet. The Gateway Riffle RST was operated from December 20, 2012, to May 31, 2013. Within the high-flow channel, two RSTs were fished in tandem at Herringer Riffle at RM 46 from December 3, 2012, through May 31, 2013. The preliminary estimate of passage at Gateway Riffle was 26,106,299 juveniles, and the Herringer Riffle location estimate was 13,880,121 juveniles.

Although Chinook Salmon and steelhead were the primary targets of trapping efforts, records were kept on all fish species caught. Twenty-four species were caught during the 2013 season. Chinook Salmon was the dominant species, comprising 99 percent of the catch. A total of 931,728 Chinook Salmon were caught in the RSTs with 357,303 (38 percent) of those captured in the low-flow channel and 574,425 (62 percent) caught in the high-flow channel.

A total of 12,821 Chinook Salmon at Herringer Riffle and 5,829 at Gateway Riffle were measured for fork length in 2013. Salmon emigration was observed from December through May, with

peak emigration occurring in January and February.

## Acoustic and Radio Telemetry

Acoustic and radio telemetry gathers baseline information on the migration and holding patterns of adult Chinook Salmon in the lower Feather River. In 2013, the telemetry study was conducted to collect additional data to evaluate the relationship between flows and passage barriers and migration patterns of prespawning adult Chinook Salmon.

Chinook Salmon with a spring-run life history enter freshwater in early summer and hold in the river up to several months before spawning. In order to collect additional data on migration patterns of prespawning adult Chinook Salmon, adults are captured and tagged with acoustic tags. Tracking their movements over barriers and through the high-flow and low-flow channels provides information on what variables may be affecting their behavior and ultimately the success of their migration.

Between May 15 and June 26, 2013, 18 adult Chinook Salmon designated as having spring-run life history traits were captured using hook-and-line sampling (angling) and tagged with acoustic tags at Sunset Pumps and the Shanghai Bend area. An additional 20 fish were captured at the FRFH and tagged with acoustic tags. These fish were monitored along the 67-mile stretch of river from the Fish Barrier Dam near the FRFH to the confluence with the Sacramento River at Verona. Twenty-seven submersible hydrophone receivers positioned at various locations along this stretch picked up the signals from the acoustic tags as the fish passed the receivers. Fixed station receivers were checked at least once per month during the survey season. Thirty-seven (97 percent) of the tagged fish were subsequently detected.

A total of 18 (90 percent) of the fish tagged at the hatchery stayed in the low-flow channel after being tagged, while 2 (10 percent) moved downstream and were last detected in the high-flow channel. All fish tagged in the river initially showed upstream movement. The receivers and mobile tracking surveys revealed that 16 (89 percent) of the fish tagged in-river swam to the fish barrier dam and then continued to stay in the low-flow channel during the entire survey period (May 15 through October 15). Two fish (11 percent) did not make it to the Fish Barrier Dam and were last detected in the high-flow channel. All fish tagged downstream of the Yuba River moved up the Feather River and did not enter the Yuba River, at least for any length of time. No obvious passage issues were observed at Sunset Pumps in 2013.

These results are similar to those in previous years indicating that spring-run Chinook Salmon in the Feather River tend to move to the upper reaches of the river, and hold in cold, deep pools until they are ready to spawn in September and early October.

## Spawning Surveys

To better understand Feather River salmon and steelhead spawning characteristics, redd surveys (a redd is a shallow depression in a streambed, excavated by a salmonid and containing deposited fish eggs) are performed to identify the location, timing, magnitude, and physical characteristics of natural spawning sites in the lower Feather River. The surveys are generally performed weekly, and most of the available spawning area between the Fish Barrier Dam and Gridley Bridge is searched.

## Salmon

Ground surveys for the 2013 Chinook Salmon redd survey began on September 10 and continued until October 25. The redd survey consisted of a total of 14 days over eight survey weeks. In the low-flow channel,

ground surveys were concentrated in lower, middle, and upper Auditorium Riffle as well as the section between Cottonwood Riffle and upper Moe's Side Channel. Hatchery Riffle was also sampled. The high-flow channel was surveyed during the last two survey weeks in October to identify any potential for redd dewatering.

The Chinook Salmon redd survey protocol for 2013 was created to provide comparable physical data (depth, velocity, and substrate characteristics) for redds in the upper sections of the low-flow channel where gravel augmentation work was scheduled in 2014. The 2013 redd survey data will be compared to redd data collected in 2014 to evaluate how salmon respond to the new gravel.

During the eight weekly surveys, 864 redds were found within the spawning area between Hatchery Riffle (RM 66.6) and lower Auditorium Riffle (RM 66.4). Another 267 redds were discovered in the high-flow channel from the Thermalito Afterbay Outlet to the Gridley Bridge.

The week 4 survey (October 1 to October 4) covering the area between Hatchery Riffle and lower Auditorium Riffle revealed the highest number of redds with 391. The second highest total was 382 redds for the survey conducted October 16 and 18 covering the high-flow channel (RM 59–50.8), Hatchery Riffle and the top of Auditorium Riffle. The locations with the largest number of redds were the lower Auditorium Riffle area with 492 (44 percent) and Hatchery Riffle with 195 (17 percent). The average depth for all salmon redds was 0.50 meters (m) (1.64 feet [ft]) with an average water velocity of 0.52 m (1.71 ft) per second. The average redd length and width was 1.9 m (6.23 ft) by 1.2 m (3.94 ft).

## Steelhead

In 2013, a total of 21 steelhead redds were identified during 9 weekly surveys. Steelhead

redds were first observed on January 10, with newly constructed redds continuously observed through March 5.

Increased turbidity and depth throughout the low-flow channel during the survey season created river conditions that precluded surveyors from effectively identifying redds. The resulting survey year was therefore truncated in scope and effort and confined to Hatchery Side Channel and Moe's Side Channel where all 21 steelhead redds were identified.

The average depth for all recorded redds was 0.28 m (0.92 ft) with an average water velocity of 0.45 m (1.48 ft) per second. The average redd length and width was 1.07 m (3.51 ft) by 0.70 m (2.30 ft). Small gravel was the dominant substrate type used by steelhead for redd construction, and overhead cover was present at 90.5 percent (19 of 21) of observed redds. Instream cover was present at 76.2 percent (16 of 21) of observed steelhead redds with small woody debris being the most common type occurring 66.7 percent (14 of 21) of the time.

### Salmon Escapement Survey

The purpose of the salmon escapement survey is to evaluate the abundance, distribution, and timing of Chinook Salmon adults spawning in the river.

The survey provides information crucial to monitoring, managing, and conserving the Feather River's salmon populations. Estimating the number of salmon returning to spawn is the basic goal of the escapement survey. However, the data are used to identify trends in population and age structure, track patterns in spawning distribution, determine proportions of hatchery versus wild fish, and explore environmental effects on pre-spawn survival rates.

The estimate is based on a weekly mark and recapture experiment in which salmon carcasses are tagged, chopped, and placed back into the river. The rate at which tagged carcasses are recovered (the recovery rate) relative to the number of carcasses checked for tags (chopped) provides the basis for an estimate of the total spawning population.

The Chinook Salmon spawning escapement survey began September 3 and continued through December 18, 2013. The survey was conducted in the low-flow channel and the high-flow channel from the Table Mountain Bridge downstream to the Gridley Bridge. Due to the low numbers of returning fish in the high-flow channel, the data were pooled with the low-flow channel data to generate one estimate for the lower Feather River.

The carcass mark and recapture study resulted in a spawning population estimate of 151,209 Chinook Salmon for the lower Feather River. There were an estimated 5,559 grilse (typically 2-year-old fish less than 65 centimeters fork length). These estimates include both fall-run and spring-run Chinook Salmon since their spawning is currently not segregated on the Feather River.

Approximately 91.0 percent of the spawning population utilized the low-flow channel. Since 2000, the long-term average for the low-flow channel's spawning population is 81.1 percent. In the low-flow channel, survey section 10 (RM 65.5) had the highest carcass concentration followed by section 8 (RM 66.5). The highest concentrations of carcasses in the high-flow channel were found in sections 24 (RM 58) and 33 (RM 53).

### Spring-run Chinook Salmon Tagging

To better understand spring-run Chinook Salmon life history in the lower Feather River and to mark fish for broodstock collection, a program was developed to mark spring-



run Chinook Salmon entering FRFH in the spring to segregate spring- and fall-run Chinook Salmon spawning in the hatchery in the fall. The program also investigates potential differences in spawning distribution and timing of the early arriving spring-run salmon in the river.

Early arriving spring-run salmon entering the hatchery were marked with individually numbered Hallprint dart tags for identification. Once marked, the fish were released into the river. During the hatchery spawning season, the tags enabled hatchery staff to distinguish the early arriving spring-run fish from the fall-run fish, so that spring-run fish could be spawned separately from the fall-run. The tags also enabled the escapement survey crew to differentiate spring- and fall-run salmon, so that any potential differences or trends in the in-river spawning behavior of the two runs could be analyzed.

In 2013, 20,057 Central Valley spring-run Chinook Salmon were tagged at FRFH, an all-time record since tagging began in 2004. Salmon were tagged from May 2 to July 1, and when spawning commenced in the fall, a total of 8,936 tagged fish were recaptured: 4,247 at the FRFH, and 4,689 in the river escapement survey.

## Otolith Thermal Marking Studies

The Chinook Salmon run in the Feather River consists of both Central Valley spring-run and fall-run fish, both of which are heavily supplemented by the FRFH. To effectively determine the composition of the run (spring-run versus fall-run) and the origin of the fish (hatchery versus wild), DWR developed an otolith thermal marking program for the FRFH. Thermal marking is an efficient method to mark 100 percent of the fish produced at the hatchery.

In 2005, 100 percent marking of spring- and fall-run Chinook Salmon began. In 2013, otolith processing was completed. Results

indicate that the proportion of wild spring-run salmon spawning in the river and FRFH are very low, probably between 1 and 10 percent.

## Snorkel Surveys

From 1999 to 2001, DWR conducted a snorkel survey focused on juvenile steelhead, but included other species and life stages. In 2010, DWR reinstated the lower Feather River snorkeling surveys with the following objectives:

- (1) determine the relative abundance and distribution of juvenile Chinook Salmon and steelhead prior to habitat improvements;
- (2) identify habitat conditions (depth, substrate, velocity, and cover) where juvenile Chinook Salmon and steelhead occur;
- (3) identify potential sites for gravel supplementation, channel improvement, and structural habitat restoration; and
- (4) identify habitat deficiencies for juvenile Chinook Salmon and steelhead in the lower Feather River prior to habitat improvements.

In 2013, the Feather River Program continued to collect data for these efforts but in a more limited way than in previous years. Data are still used to determine the relative abundance and distributions of age-0 (fish in the first year of their life) steelhead prior to habitat improvements. Characteristics of habitat where juvenile steelhead and salmon occur are quantified and other high-use areas of the low-flow channel that may benefit from habitat improvements are identified.

In future years, habitat availability will be studied to investigate habitat preferences by species and size classes. As habitat restoration projects begin, survey data may contribute to guiding and improving future habitat projects.

## Green Sturgeon Studies

The primary objectives of sturgeon studies are to:

- determine if adult migration barriers exist;
- evaluate migration patterns including residence times and factors affecting them;
- identify distribution and habitat preferences of adults and juveniles;
- evaluate the effect of Oroville Facilities operations on passage success and distribution;
- estimate the annual abundance of adult Green Sturgeon;
- determine potential spawning grounds that can be target areas for egg and larval surveys; and
- provide DWR, the Federal Energy Regulatory Commission, NOAA Fisheries, and DFW with data to make management decisions concerning future monitoring programs, operational changes of the facilities, and/or habitat enhancement within the lower Feather River.

### Sturgeon Sonar Survey

In 2013, 88 sonar surveys were completed from February 19 to December 30. Fourteen different sites were inspected on the lower Feather River although most of the surveys were conducted at three primary locations: Shanghai Bend (RM 24.7), Sunset Pumps (RM 38.5), and the Thermalito Afterbay Outlet (RM 59). These primary sites made up approximately 82 percent of all surveys. Shanghai Bend and Sunset Pumps were both surveyed 24 times and the Thermalito Afterbay Outlet was surveyed 23 times.

A total of 17 sturgeon were detected during the survey season (14 at Shanghai Bend, 2 at Sunset Dam, and 1 at Beer Can Beach [RM 7]). At Shanghai Bend, the sturgeon were detected at depths ranging from 1.0 m (3.3 ft) to 7.1 m (23.3 ft) with a mean depth

of 3.4 m (11.2 ft). Sturgeon detected at Sunset Pumps ranged in depth from 5.4 m (17.7 ft) to 5.6 m (18.4 ft) with a mean of 5.6 m (18.4 ft). At Beer Can Beach, depths for observed sturgeon ranged from 1.3 m (4.3 ft) to 7.5 m (24.6 ft) with a mean depth of 2.8 m (9.2 ft). At Shanghai Bend, observed sturgeon had a mean length of 1.68 m (5.5 ft) (+/-0.26 m [0.85 ft]); sturgeon at Beer Can Beach had a mean length of 2.07 m (6.79 ft) (+/-0.31 m [1.02 ft]); and sturgeon observed at Sunset Pumps had a mean length of 1.49 m (4.89 ft) (+/-0.13 m [0.43 ft]).

### Sturgeon Angling/Telemetry Studies

A total of four Green Sturgeon were caught and tagged using traditional angling gear (rod and reel with baited hook) from April 18 through December 2, 2013. Sturgeon caught before July 1 are designated as pre-spawn and are therefore tagged with external acoustic tags whereas those fish caught after July 1 are post-spawn and may be tagged with internal acoustic tags. Once tagged, a sturgeon's location can be identified as it passes through the array of acoustic receivers placed in the Feather River from Verona (RM 0) to the Fish Barrier Dam (RM 67) near the FRFH. The first adult Green Sturgeon was captured and externally tagged on June 3 just downstream of Shanghai Bend where it remained until July 5. This fish migrated down to Boyd's Pump Boat Launch (RM 22) and was last detected on July 6 near the mouth of the Bear River (RM 12.4). The fate of this sturgeon is uncertain; it is possible that the sturgeon shed the external tag or was taken by an angler.

The second adult Green Sturgeon was captured and externally tagged on June 12 just downstream of Shanghai Bend where it remained until June 19 when it began moving downstream. It left the lower Feather River on June 20 and entered the main stem of the Sacramento River at Verona.

The third sturgeon was captured and tagged on June 12 at Shanghai Bend. This sturgeon



moved between Sunset Pumps (RM 38.5) and Beer Can Beach multiple times and passed through Shanghai Bend on six different occasions in flows ranging from 5,368 to 6,816 cfs. It also migrated up to Sunset Pumps on two different occasions in flows ranging from 5,438 to 5,686 cfs, but never passed Sunset Pumps. This sturgeon provided critical passage information for future management decisions as it clearly showed that Shanghai Bend in its current configuration is probably not a major passage barrier to adult sturgeon when flows are above approximately 5,368 cfs. This information also suggests that Sunset Pumps may be impassable to sturgeon when flows range from around 5,438 to 5,686 cfs. This fish was recaptured on November 12 and internally tagged. It was recaptured again on November 25 at which time its external tag was permanently removed.

The fourth Green Sturgeon was caught on November 13 and was internally tagged.

### **Sturgeon Egg and Larval Studies**

Ten egg mats were deposited on the river bottom just downstream of Shanghai Bend from June 10 through July 15 for a total of 338.8 wetted mat days. (One mat placed on the river bottom for 24 hours equals one wetted mat day). The mats were hauled to the surface and checked for eggs every 3 to 4 days. Sampling locations were determined based on the presence of multiple sturgeon detected with sonar, observation of angler-caught Green Sturgeon, or field observations of breaching sturgeon. In 2013, egg mats were set in waters that ranged from 1.6 m (5.2 ft) to 5.5 m (18.0 ft) deep. Flows ranged from 96–192 cubic meters per second (3,390–6,780 cfs). Other water parameters measured during the sampling period included water temperatures of 18.75–21.61 °C (65.75–70.90 °F), specific conductance of 88.6–91.3 microsiemens per centimeter, and dissolved oxygen levels of 9.21–10.20 milligrams per liter. No sturgeon

eggs or larvae were sampled with egg mats during the 2013 sampling season.

D-nets (mesh net on a D-shaped frame) were deployed for the first time in the lower Feather River in 2013. Five separate locations just downstream of Shanghai Bend were sampled. D-nets were deployed once a week from sunset to sunrise and checked every 30–60 minutes. A total of 56,840,758 cubic meters of water was sampled during the five surveys from June 19 to July 17. D-nets were set in waters that ranged from 1.2 m (3.9 ft) to 2.7 m (8.9 ft) deep. Flows ranged from 120–193 cubic meters per second (4,238–6,816 cfs). Other water parameters measured during the sampling period included water temperatures of 19.35–21.48 °C (66.83–70.66 °F), specific conductance of 71.1–80.8 microsiemens per centimeter, and dissolved oxygen levels of 10.14–10.61 milligrams per liter. No sturgeon eggs or larvae were sampled with D-nets during the 2013 sampling season.

Other species sampled included Sacramento Sucker (*Catostomus occidentalis*), American Shad (*Alosa sapidissima*), unidentified lamprey species, Wakasagi (*Hypomesus nipponensis*), American Shad eggs, and unidentified catfish and sculpin species.

### **Steelhead Acoustic Tagging**

A broad range of restoration and recovery efforts has been identified in the lower Feather River to assist in the recovery of steelhead; however, the ability to measure their success or improve the status of Central Valley steelhead has been hampered by a lack of information regarding steelhead life history and population dynamics. To address this lack of information, DWR began a tagging program aimed at identifying behavior and survival of steelhead released as smolts from the FRFH.

In 2013, the Feather River Program continued the steelhead acoustic tagging program that

was developed in 2012 to determine the downstream migration success rate for FRFH steelhead released into the Feather River at the Boyd's Pump Boat Launch release site. Using fixed station and mobile acoustic telemetry, DWR tracked the migration of acoustically tagged steelhead as they left the system.

For this study, 200 hatchery-reared steelhead were implanted with acoustic tags and divided into 8 separate release groups, released over the course of 4 days. Each release group was placed into a much larger group of untagged fish and then transferred by truck to the release site. All of the releases took place at Boyd's Pump Boat Launch in Yuba City. Fish in the direct release group went directly into the river, while fish in the net pen group were put into a large net pen for an acclimation period prior to release. All fish were released in early February between 9 a.m. and noon.

An array of fixed acoustic receivers placed at 10 to 15 kilometer intervals downstream of the launch site detected 179 tagged steelhead. These receivers were downloaded monthly during mobile roving surveys conducted to locate fish in the reaches between receivers. Movement histories created for each detected fish provided an estimated outmigration success rate of 40 percent for fish leaving the lower Feather River. It is unknown at this time whether this success rate is typical of other Central Valley rivers, or if Feather River steelhead fare better or worse. When the Feather River steelhead hatchery genetic management plan is completed and implemented, additional studies targeting steelhead survival in the lower river will be initiated. Efforts will focus on release strategies that improve both survival and homing back to the Feather River and the FRFH.

## Fish-related Mitigation Projects

In 1986, DWR and DFW signed the Delta Pumping Plant Fish Protection Agreement (Delta Fish Agreement) to annually provide funds to offset direct losses of Chinook Salmon, steelhead, and Striped Bass at Banks Pumping Plant. The Delta Fish Agreement is commonly referred to as the Four Pumps Agreement because it was adopted as part of the mitigation for four additional pumps at Banks Pumping Plant. Direct losses are defined as losses of fish that occur from the time fish are drawn into Clifton Court Forebay until the surviving fish are returned to the Delta. In principle, DFW and DWR intended this agreement to offset direct losses of all fish caused by the diversion of water by the pumping plant starting in 1986. However, at that time, information on impacts and measures to offset those impacts was sufficient only to deal with Chinook Salmon, steelhead, and Striped Bass. The agreement allowed for addressing impacts on other fish species once impacts could be identified and measures could be developed that would offset such impacts.

The agreement formalized the Delta Pumping Plant Fish Advisory Committee consisting of representatives from interest groups concerned with fish resources affected by the SWP, including, but not limited to, representatives of the SWP water contractors, sport and commercial fishing groups, and environmental groups. DWR and DFW work with the Delta Pumping Plant Fish Advisory Committee to review the success of the agreement in offsetting the direct effects of diversions by Banks Pumping Plant.

To mitigate fish loss, mitigation projects are selected and funded by the Delta Fish Agreement. The agreement outlines how project proposals are reviewed and selected for funding and gives priority to mitigation measures for habitat restoration

and other nonhatchery measures. Under the agreement, DWR calculates fish loss as prescribed in the agreement, and approved mitigation projects earn fish mitigation credits to satisfy the fish loss mitigation provisions in the agreement. Mitigation is on a fish-for-fish basis.

The agreement provides for two funding components. One component is the Annual Mitigation Account for compensating the annual fish loss. It has no expiration date. The second is a \$15 million Lump Sum Account provided by DWR for additional projects to compensate for post-1986 fish loss. The agreement specifies that the \$15 million must be expended by December 29, 1996.

The Delta Fish Agreement has been amended four times:

- Amendment 1 (1996)—extended the period to expend the remaining \$9 million of the \$15 million to December 29, 2001.
- Amendment 2 (2001)—extended the period to expend the remaining \$5 million of the \$15 million to December 31, 2004.
- Amendment 3 (2004)—extended the period to expend the remaining \$3.6 million of the \$15 million to December 31, 2007.
- Amendment 4 (2011)—extended the period to expend the remaining \$1.6 million of the \$15 million to December 31, 2015.

Since 1986, DWR has spent \$61.9 million on mitigation projects developed under the Delta Fish Agreement. Mitigation fund expenditures through December 31, 2013, were \$48.3 million for the Annual Mitigation Account and \$13.6 million for the \$15 million Lump Sum Account. Funds approved but unexpended from each account were \$9.5 million and \$1.4 million, respectively.

For more information, see DWR's website.

## Climate Change

Climate change involves complex interactions and will have diverse impacts on California's natural resources. The SWP was designed based on historical hydrology and is therefore vulnerable to changes in climate that may shift the hydrology in challenging ways. Climate warming is expected to continue shifting rainfall and runoff patterns and diminishing the Sierra Nevada snowpack affecting DWR's ability to efficiently operate the SWP. In the future, sea-level rise, increased occurrence of extreme precipitation events, and prolonged droughts may also threaten operation of the SWP. Increased saline water flows and reduced surface flows due to droughts may require increased fresh water storage releases to maintain water quality requirements. Climate change is likely to exacerbate existing ecological issues in Central Valley rivers and the Delta by raising water temperatures, increasing sediment loading (as a result of increased wildfires and more extreme precipitation events), and increasing water demands.

DWR is committed to contributing to statewide, national, and international efforts to mitigate the future impacts of climate change by reducing greenhouse gas (GHG) emissions from its activities and adapting to unavoidable climate change impacts. DWR's efforts throughout 2013 represent the continuation of its multipronged approach to addressing these issues by:

- conducting research to better understand potential future impacts;
- monitoring and reporting GHG emissions;
- developing plans, strategies, and actions to improve the resiliency of DWR/SWP facilities and operations;
- reviewing/consulting with outside experts; and
- developing and managing data.



## Completed in 2013

### Reporting

**2012 Emissions Reports to The Climate Registry.** DWR's emissions are primarily the result of electricity generation at DWR-owned power plants and power purchase transactions to provide power for operation of the SWP. Between 2007 and 2009, DWR reported its estimated total direct and indirect GHG emissions to the California Climate Action Registry and earned Climate Action Leader Status each year. In 2010, emissions reporting transitioned to The Climate Registry, which is a North America-wide registry.

In 2012, DWR became aware of a systematic problem with the methodology used in accounting for and reporting its emissions to The Climate Registry. The methodology had inaccurately accounted for emissions, resulting in an overstatement of DWR's GHG emissions of approximately 1 million tons per year. During 2013, DWR worked with its private verifier and The Climate Registry staff to revise the methodology and gain approval for an alternative methodology that more accurately reflects DWR's actual emissions and is consistent with GHG accounting done for the DWR *Greenhouse Gas Emissions Reduction Plan*. DWR will be working to resubmit emissions reports in 2014 for years 2010, 2011, and 2012 using the revised methodology.

In May 2013, DWR reported its GHG emissions for the emission year 2012 to the California Air Resources Board under its obligation pursuant to California mandatory GHG emissions reporting regulations (Title 17, California Code of Regulations, Sections 95100–95158). The report included energy generated and consumed by the SWP, GHG emissions due to energy imported from Reid Gardner Unit 4, and sulfur hexafluoride emissions associated with the SWP's switchyard circuit breakers. In addition, to meet its compliance obligation for the Cap

and Trade Program, DWR participated in GHG allowance auctions conducted by the California Air Resources Board.

## Ongoing during 2013

### Research

#### **Evaluation of Benefits of Meadow Restoration on Sierra Nevada Water Supply.**

DWR has provided funding to the U.S. Forest Service for a 3-year investigation (partly extended to 5 years due to operational and management difficulties) of the hydrologic effects of meadow restoration and how restored meadows can contribute to improved system operation and ecosystem functioning. The goals include:

- delineating potential meadows using available geographic information system datasets;
- delineating meadows in the field and comparing the field delineations to those derived from geographic information system analysis;
- assessing meadow condition in a random sample to extrapolate to the condition of all Sierra meadows; and
- installing instrumentation to assess hydrology of undisturbed and restored meadows.

Project accomplishments in 2013 included:

- further update of an annotated bibliography of scientific literature pertaining to meadow restoration and hydrology;
- further development of an inventory of meadow communities on public lands in the Sierra Nevada;
- field assessment of meadow delineations and quantification of extent and degree of meadow erosion;
- water budget studies for representative meadows (partially completed and continuing); and

- completion and publication of a model of groundwater dynamics in incised meadows, indicating that meadow erosion decreases long-term groundwater storage.

The results of the field assessment and quantification of meadows indicate that the majority (approximately 70 percent) of Sierra Nevada meadows are sufficiently eroded/incised to eliminate beneficial hydrologic functions. Potential improvements in groundwater storage capacity in the Sierra Nevada using this total meadow acreage are estimated at approximately 53,000 acre-feet per year.

Long-term hydrologic effects of meadow erosion are still uncertain, but likely include diminished streamflow, lower regional water tables, reduced mountain block recharge, and reduced groundwater storage in headwater areas.

**Tree-ring Reconstruction of Paleostreamflows in the Sacramento, San Joaquin, and Klamath River Basins.** DWR executed a contract with the University of Arizona for development of tree-ring reconstructions of paleostreamflows in the Sacramento, San Joaquin, and Klamath river basins. Extending streamflow records beyond the relatively short period of the historical record provides an improved picture of climate variability and yields data for use in operations model sensitivity analyses and for vulnerability analyses. The contract began in fall 2010, and the final report will be completed in 2014. Additionally, with funds provided by Reclamation, the University of Arizona is developing a database of climate analog years for DWR, including the paleodata. Most of the field work involving coring living trees was completed in 2013, but collection of dead wood using a chainsaw could not be performed due to dry conditions and U.S. Forest Service prohibitions on chainsaw use. Chronologies

have been prepared for the samples collected, and preliminary reconstructions have been developed with presently available samples.

**Sensitivity Analysis of Sierra Nevada and Coastal Range Upper Watersheds to Temperature Changes Using the Soil and Water Assessment Tool.** Physically based, distributed hydrologic models are essential tools for evaluating long-term hydrologic changes in California. The SWAT (Soil Water Assessment Tool) is being used to develop individual models of 18 watersheds in the Sierra Nevada and Coastal Range mountains for areas tributary to the Sacramento-San Joaquin Delta. A common and consistent database of digital elevation, land use, soil, and climate data is used with a geographic information system to develop the SWAT models. Model calibration and validation are based on observed or reconstructed monthly unimpaired streamflows at the watershed outlets. The calibrated models will be used to study the effect of imposed warming of 1–4 °C (34–39 °F) on the hydrology of these source watersheds and the impact on water supply in the Central Valley.

**Reoperation of Water Supply and Flood Protection Systems.** DWR is conducting a system reoperation study in cooperation with other State and federal agencies, local water districts, groundwater managers, and other stakeholders, to identify potential strategies for reoperation of the statewide flood protection and water supply systems. The opportunity to reoperate portions of California's statewide water system to yield increased water resource-related benefits was recognized by the State Legislature in Senate Bill X2 1 (Perata; Chapter 1, Statutes of 2008; Water Code Section 83000).

In support of the legislative objectives, DWR developed the system reoperation study to identify viable reoperation



strategies and understand how integrated management can:

- improve the reliability of municipal and irrigation water supply;
- reduce flood hazards;
- restore and protect ecosystem function and habitat conditions;
- buffer the hydrologic variations expected from climate change; and
- improve water quality.

Development of the system reoperation study is a multiphased effort that includes:

- Phase 1, Plan of Study (completed in 2011);
- Phase 2, Strategy Formulation and Refinement (completed in 2013);
- Phase 3, Preliminary Assessments of Strategies (planned to be completed in 2015); and
- Phase 4, Reconnaissance Level Assessments of Strategies (planned to be completed in 2017).

The system reoperation strategies will be analyzed with appropriate climate change scenarios and evaluated for their ability to reduce or minimize climate change impacts to water supply, flood management, and the ecosystem.

Project accomplishments in 2013 included completing the draft Phase 2 report that includes the Tradeoff Analysis and Forecast-based Operations Analysis technical reports.

### **Review and Consultation**

**DWR Climate Change Technical Advisory Group.** The Climate Change Technical Advisory Group (CCTAG) advises DWR on the scientific aspects of climate change, its impacts on water resources, the use and creation of planning approaches and analytical tools, and the development of adaptation responses. As a standing technical advisory group serving all DWR

programs, it provides external guidance and support for a variety of climate-related issues, including scientific review of climate change models and scenarios, interpretation of scientific information produced by the National Climate Assessment and the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. It also informs DWR's climate change adaptation policies, providing consistency in the scientific advice DWR receives on climate change. DWR's Climate Change Program oversees and coordinates the CCTAG.

The CCTAG met several times in 2013 and established a road map for global climate model selection for California water resources and initial planning for a list of recommendations to DWR on handling climate change. These efforts are expected to be completed by March 2015. All the CCTAG meeting materials are posted on DWR's climate change website.

### **Planning**

#### **Data Collection and Climate Services.**

Since 2011, DWR has been developing the Flood Emergency Response Information Exchange. Efforts are underway to link information presented in the exchange to the climate data in the California Climate Data Archive. The exchange will also house a new map-based server for precipitation depth-duration-frequency curves and annual extremes data sets that make up Bulletin 195 (*Rainfall Analysis for Drainage Design*).

For observing data systems, DWR is continuing its partnership with the Earth Systems Research Lab of the National Oceanic and Atmospheric Administration and Scripps Institution of Oceanography to deploy new monitoring equipment for extreme precipitation events. For this network, water vapor measurements, wind profilers, soil moisture sensors, and freezing-level radar are being deployed across the State. The data from this network is currently served through the National

Oceanic and Atmospheric Administration's Hydrometeorology Testbed website, but efforts continue to get the data into the California Data Exchange Center. A new remote sensing monitoring effort using airborne LIDAR (light detection and ranging) measurements of the snowpack is being developed under a joint project between DWR and the National Aeronautics and Space Administration's Jet Propulsion Laboratory.

### **Data Development and Curation**

#### **DWR Climate Change Basic Data Group.**

DWR's Climate Change Basic Data group is composed of representatives from the Division of Statewide Integrated Water Management, the Division of Flood Management, and DWR's regional offices. The group's goals are to assess current climate data acquisition efforts at DWR, promote cooperation and coordination across programs, and strategize on issues of data storage, management, and dissemination. A draft report on snow/rain trends in California was completed during 2013, with a final version to be completed in early 2014. A partnership with the Western Regional Climate Center continued for coordination of statewide climate data collection, storage and dissemination.

DWR volunteer climate data collectors were contacted and encouraged to join the Community Collaborative Rain, Hail & Snow Network. During 2013, the basic data group worked with the Western Regional Climate Center to inventory old climate records in the regional offices and integrate existing data collection and management within DWR. New projects on research into snow and rain trends using DWR and other data sources will be conducted.

### **Policy**

**Development of Internal DWR Policies on Climate Change Mitigation, Analysis, and Adaptation.** In June 2009, DWR's director formally established the CEQA Climate

Change Committee to review all climate change analyses in DWR environmental documents and exemption considerations prior to publication. Over the past 4 years, the CEQA Climate Change Committee's recommendations and approach to addressing climate change issues in CEQA documents continued to develop as new legislation and litigation has provided additional requirements, information, and context.

In 2010, the committee began a three-phase process to develop a comprehensive DWR Climate Action Plan which will contain internal policies to address climate change mitigation, effects analysis, and adaptation.

**Climate Action Plan Phase I.** Climate Action Plan Phase I is the comprehensive DWR-wide *Greenhouse Gas Emissions Reduction Plan* that documents DWR's actions to reduce GHG emissions from its activities consistent with Assembly Bill 32 and Executive Order S-3-05. It complies with CEQA Guidelines Section 15183.5 regarding GHG reduction plans. Phase I was completed and began implementation in 2013.

**Climate Action Plan Phase II.** Phase II will be a guidance framework and data toolbox to guide incorporation of climate change in future planning analysis of DWR projects and activities. Completion of Phase II will result in a guidance document and an accompanying climate scenario toolbox to assist DWR project managers with assessing the need for climate change analysis in their planning activities and guiding decision making for selection of analytical tools and analysis procedures, as well as assumptions about future conditions. The guidance framework will ensure that DWR projects meet standards for consistency, quality, and adequacy in climate change analysis.

In 2013, Phase II work continued with CCTAG to evaluate climate change scenarios and analysis methods. Work is

also continuing on a data toolbox that will include historical climate change analysis data as well as newly developed tools and data. All historical data has been compiled and metadata is being developed for these climate change scenarios.

**Climate Action Plan Phase III.** Phase III will be a DWR Climate Change Resiliency and Adaptation Plan. This plan will review DWR-owned and operated facilities and DWR's activities throughout the State, conduct a vulnerability analysis of these facilities and activities, and develop resiliency and adaptation strategies for the department to prepare and protect DWR's assets and services from expected changes in climate.

In 2013, an interdisciplinary team was assembled to develop the vulnerability assessment for DWR facilities and activities. The team met weekly to collaborate on progress and discuss data, tools, and analytical approaches. Analyses were conducted for wildfire and extreme heat impacts.

## Initiated during 2013

### Research

**Climate Change Impacts on California Water Rights Study.** This project will look at how changing streamflow, as a result of climate change, could potentially impact the ability of water rights holders to exercise their water rights. As the amount and timing of surface water flows change, the ability of water rights holders to divert water as they have in the past is expected to change. This study will attempt to quantify those changes and discuss the potential impacts to water users.

In 2013, a final scope of work and plan of study were developed, and a variety of different approaches to analyze the impact of climate change on California water rights were investigated. This study is expected to be completed in 2014.

## Environmental Document Review

Some environmental documents handled by the State Clearinghouse concern proposed activities that could affect the SWP. Such documents are regularly reviewed to identify any public safety or liability issues arising from the proposed activities.

During 2013, the Division of Environmental Services, Environmental Document Review Section tracked documents related to development along the California Aqueduct, levee encroachment, dam safety issues, water transfers and other water supply issues, wastewater treatment, quarry development, solar and wind power facilities, and climate change issues. Significant climate change issues increased from 2 documents in 2010 (when the State CEQA Guidelines were amended to address GHG emissions pursuant to Senate Bill 97 [2007]) to 12 in 2011, 19 in 2012, and 26 in 2013.

DWR comments submitted through the CEQA and/or NEPA processes addressed a number of issues, including safety and water supply, encroachment on physical facilities, impacts to crossdrainage facilities, correct signage for turnouts, inclusion of design standards related to storm drainage, potential for pollution in SWP water supplies, potential damage to SWP pipelines, and dams near jurisdictional size.

In 2013, the Environmental Document Review Section screened 2,586 State Clearinghouse documents. After screening, 1,083 documents were referred for information, including notices of preparation and various final documents. Additionally, 102 formal referrals were made for negative declarations, notices of preparation, EIRs, and NEPA documents.

Seventy-one formal referrals were sent to the Division of Operations and Maintenance, six to the State Water Project Analysis Office, and one to the SWP Power and Risk Office.

The total number of referrals to the Division of Operations and Maintenance and the State Water Project Analysis Office remained essentially the same as in 2012 since total SWP-related referrals decreased by only one.

In 2013, formal referrals to all other DWR reviewers, including the Central Valley Flood Protection Board and the Division of Safety of Dams, were down 25 percent from 2012. This reduction is relatively insignificant since the total number of referrals was small when compared to the total number of documents (56 were referred in 2010, 48 in 2011, 45 in 2012, and 34 in 2013). In addition, Central Valley Flood Protection Board referrals by the Environmental Document Review Section are made only if the State Clearinghouse does not directly assign an appropriate document to the board.







## **Chapter 4**

# **Water Quality Programs**

*The California Aqueduct near the Delta Field Division.*

## Significant Events in 2013

The State Water Resources Control Board (SWRCB) initiated Phase 4 of the review of the 2006 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*.

The Suisun Marsh Plan was published in May 2013.

*Information in this chapter was contributed by the Division of Environmental Services, the Division of Operations and Maintenance, and the State Water Project Analysis Office.*

The State Water Project (SWP) is the largest state-built, multipurpose water project in the United States. California's existence and continued prosperity depends on water. More than two-thirds of the people of California rely partly or wholly on the SWP for their daily water needs. The Department of Water Resources (DWR), Division of Operations and Maintenance currently maintains 16 automated water quality monitoring stations at key locations along the SWP. This network of automated stations continuously monitors a variety of water quality parameters throughout the system and provides real-time data to SWP water contractors. In addition, field grab samples collected weekly, monthly, quarterly, or annually from more than 30 SWP locations are routinely analyzed for a broad range of constituents at the State's Bryte Chemical Laboratory.

## Delta Water Quality

Maintaining adequate water quality to support multiple beneficial uses of water from the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) is of concern to DWR as well as other resource agencies. The State Water Resources Control Board (SWRCB) establishes water quality objectives to protect a variety of beneficial uses of water within the Bay-Delta. The objectives are contained within the water quality control plans (WQCPs) adopted by the SWRCB. Water quality objectives are also contained in Article 19 of the long-term SWP water supply contracts. The California Department of Public Health (CDPH) establishes maximum contaminant levels for treated drinking water.

The SWRCB adopted the 2006 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) on December 13, 2006 (Resolution No. 2006-0098).

The SWRCB adopted Water Right Decision 1641 (D-1641) in December 1999 (amended March 15, 2000). D-1641 implements the objectives of the Bay-Delta Plan. D-1641 amends the water rights of a number of water rights holders—primarily those for the SWP and Central Valley Project (CVP)—to help achieve the WQCP objectives.

For additional background information about the SWRCB's activities and the Bay-Delta Plan, see the sidebar, State Water Resources Control Board, and Chapter 7, Water Supply Development and Reliability.

## 2006 Bay-Delta Plan Review

Water Code Section 13240 requires that the WQCP be periodically reviewed. Federal Clean Water Act Section 303(c) (33 U.S.C. Section 1313(c)) requires a triennial review of State water quality "standards," as defined in the act.

The WQCP review and amendment process consists of review of the Bay-Delta Plan to identify elements that may need amendment or new elements that may need to be added, staff preparation of any amendments or revision of the entire WQCP, and SWRCB adoption of some or all of the amendments or revisions. SWRCB information-gathering activities may affect the scope of the WQCP review and may include a series of evidentiary hearings on critical issues concerning the Delta's ecology. The review includes both the review and update of water quality objectives (including flow objectives) and the program of implementation in the Bay-Delta Plan, as well as changes to water rights and water quality regulation consistent with the program of implementation.

## State Water Resources Control Board

The State Water Resources Control Board (SWRCB), established by the California Legislature in 1967, oversees water rights and protects water quality by setting and implementing statewide policy, administering appropriate water rights, coordinating with and supporting Regional Water Quality Control Board (RWQCB) efforts, and reviewing petitions that contest RWQCB actions. The five SWRCB members are appointed by the Governor and confirmed by the Senate. SWRCB is responsible for four major programs.

Water quality: to preserve, protect, enhance, and restore water quality.

Water rights: to issue permits for water rights specifying amounts, conditions, and construction timetables for diversion and storage.

Financial assistance: to assist local agencies and individuals with pollution prevention or clean-up.

Enforcement: to enforce water rights and water quality laws and regulations.

Under their water quality authority, the SWRCB and RWQCBs adopt water quality control plans (WQCPs) for each of the planning basins in the State. The WQCPs contain water quality objectives for flow, salinity, dissolved oxygen levels, and other parameters necessary for the protection of various beneficial uses, such as municipal and industrial, agricultural, and fish and wildlife. The SWRCB implements these objectives in a number of ways, depending on the circumstances, including imposing conditions on water rights permits and licenses.

The SWRCB amended Water Right Decision 1641 (D-1641) on March 15, 2000, which placed terms and conditions on a number of water rights, primarily those for the State Water Project (SWP) and Central Valley Project (CVP). D-1641 implemented the objectives in the 1995 Bay-Delta Plan. The Department of Water Resources and the Bureau of Reclamation operate the SWP and CVP in coordination to meet the terms in D-1641 and other applicable regulatory requirements relevant to each project.

Current water quality objectives for the Sacramento-San Joaquin Delta and Suisun Marsh are contained in the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan), adopted December 13, 2006. The SWRCB is required to conduct periodic updates of the Bay-Delta Plan. As part of the update process, the SWRCB conducts proceedings to gather information, receive recommendations, consider public comments, and facilitate detailed discussions to evaluate new information relevant to potential changes to the water quality objectives.

Some of the recent issues of concern related to the WQCP include pelagic organism decline, special status fish species, Delta inflow, San Joaquin River flows, and southern Delta salinity.

In July 2008, the SWRCB adopted the *Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, which prioritizes and describes the scope of individual activities and provides specificity regarding timelines and resource needs for implementing coordinated activities in the Bay-Delta.



The SWRCB is conducting the current review in four phases:

- Phase 1 involves updating San Joaquin River flow and southern Delta water quality requirements.
- Phase 2 involves other comprehensive changes to the Bay-Delta Plan to protect beneficial uses not addressed in Phase 1 (e.g., objectives for Delta outflows, Sacramento River inflows, export constraints, Delta Cross Channel gate closure requirements, and Suisun Marsh protection).
- Phase 3 will involve changes to water rights and other measures to implement changes to the Bay-Delta Plan from Phases 1 and 2.
- Phase 4 involves developing and implementing flow objectives for priority Delta tributaries outside of the Bay-Delta Plan updates.

Phase 1 began in 2009, Phase 2 began in 2012, and Phase 4 began in 2013.

In 2013, Phase 1 continued with a SWRCB hearing on the adequacy of the draft substitute environmental document released for public review and comment in December 2012. The substitute environmental document provides analysis of the potential environmental impacts of the proposed alternatives for revisions to the objectives for southern Delta salinity and San Joaquin River flows and the program of implementation for those objectives. The comment period deadline was extended from March 5 to March 29, 2013.

Phase 2 continued in 2013, with the SWRCB providing an informational update about Phase 2 at its April board meeting and the release of the final summary report on the three Phase 2 public workshops held in fall 2012. The workshops were held to receive information and discuss the scientific and technical basis for considering potential

changes to the 2006 Bay-Delta Plan. The workshop topics were ecosystem changes and the low-salinity zone; Bay-Delta fishery resources (focused on pelagic fishes and salmonids); and analytical tools for evaluating the water supply, hydrodynamic, and hydropower effects of the Bay-Delta Plan.

Phase 4 began in 2013. The SWRCB plans to consult with fisheries resource agencies and collaborate with stakeholders in the development of flow criteria and objectives for priority Delta tributaries. In July, the SWRCB submitted a request to the Delta Stewardship Council's Delta Science Program for assistance with identifying methods for determining flow criteria.

## Operations Under D-1641

In 2013, DWR and the Bureau of Reclamation (Reclamation) jointly operated the SWP and CVP in accordance with D-1641, which includes water quality, flow, and operational criteria for the SWP and CVP Delta operations. SWP and CVP operations were coordinated to meet the various objectives of the Bay-Delta Plan, Central Valley Project Improvement Act, and biological opinions (BiOps) for listed species as well as other regulatory requirements. Fish species currently listed under the Endangered Species Act and the California Endangered Species Act include the winter and spring runs of Chinook Salmon, Delta Smelt, steelhead, and Green Sturgeon.

Real-time monitoring of fish movement and conditions in the estuary aids daily water management and provides timely protection of targeted fish species from entrainment at the Delta pumping facilities.

D-1641 includes the requirement to monitor a number of stations within the Delta for specific water quality constituents. DWR conducts extensive monitoring in the Delta and the Suisun Marsh.



Figure 4-1 shows water quality compliance and monitoring stations throughout the Sacramento-San Joaquin Delta specified by D-1641.

For a discussion of other environmental issues, see Chapter 3, Environmental Programs.

## Delta Cross Channel Gates

The Delta Cross Channel gates are operated in accordance with SWRCB D-1641. In 2013, the gates were open for 159 days to allow fresher Sacramento River water to flow into interior Delta channels toward the SWP and CVP export facilities. Reclamation's standard operating procedures call for gate closure when flow on the Sacramento River at Freeport reaches between 20,000 cubic feet per second (cfs) and 25,000 cfs to reduce flooding potential on the Mokelumne River and to prevent scouring on the downstream side of the gate structure. D-1641 contains measures that require gate closure under certain conditions from November 1 through May 20 for fisheries protection as requested by the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service, and the Department of Fish and Wildlife (DFW).

## Water Quality Standards

Water quality objectives in D-1641 are categorized by the beneficial uses they are intended to protect, including municipal and industrial, agricultural, and fish and wildlife. DWR operators adjust upstream releases and Delta exports to meet D-1641 water quality and flow standards. D-1641 contains salinity standards (recorded as electrical conductivity [EC]) for three stations in the South Delta downstream of Vernalis. The stations are primarily influenced by San Joaquin River flows and in-Delta diversions. San Joaquin River flows are not influenced by SWP upstream reservoirs, but local water levels may be influenced by SWP exports, and

circulation may be influenced by the annual placement of South Delta barriers.

For more information about the South Delta barriers, see Chapter 2, Delta Resources, and Chapter 3, Environmental Programs.

## 2012–2013 Water Year Hydrologic Classifications

SWRCB's D-1641 contains water quality and flow standards that are conditioned by water year type and generally become less stringent in years with less precipitation. The water year classification system provides relative estimates of a basin's available water supply based on the amounts of rainfall, snowmelt runoff, and groundwater accretion rates. Water year types are classified as "wet," "above normal," "below normal," "dry," or "critical."

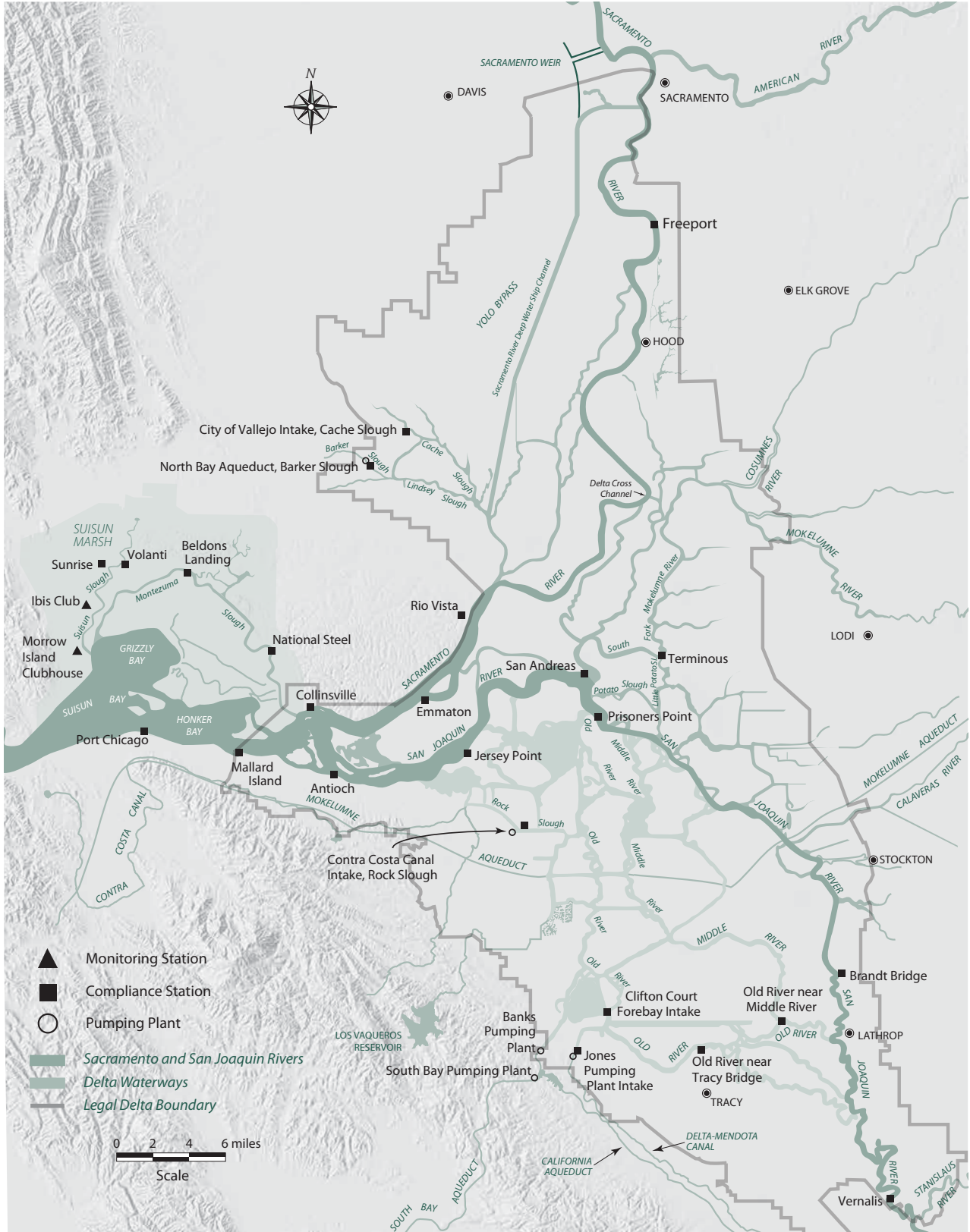
The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) forecast on May 1 of each year determines the water year type for the implementation of flow and water quality criteria contained in D-1641. In 2013, the SWP and CVP were operated using water quality and flow criteria based on the May 1 forecast of a dry water year for the Sacramento River basin.

The Sacramento Valley 40-30-30 Index was dry, and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) was critical, based on observed data for water year 2012–2013.

For a detailed discussion of water year 2012–2013, see Chapter 8, Water Supply.

## Municipal and Industrial Objectives

D-1641 includes a year-round 250 milligrams per liter (mg/L) (maximum mean daily) chloride objective that is in effect at Delta export locations (Contra Costa Canal Pumping Plant No. 1, Clifton Court Forebay,



**Figure 4-1 D-1641 Water Quality Compliance and Monitoring Stations in the Sacramento-San Joaquin Delta**

Jones Pumping Plant, Cache Slough at the City of Vallejo Intake, and Barker Slough). Chloride levels remained below the objective for all days in 2013.

An additional municipal and industrial water quality objective for chloride at the Contra Costa Canal Intake, near Rock Slough, specifies that the chloride level must be below 150 mg/L for a given number of days during the year, dependent upon the water year forecast. This objective was met in calendar year 2013.

### Agricultural Objectives

D-1641 contains agricultural salinity objectives, which vary by location. The salinity objectives, recorded as EC, are based on both water year type and a 14-day running average during the irrigation season, from April to mid-August, at Emmaton, Jersey Point, Terminous, and San Andreas in the West and Central Delta. The agricultural salinity objectives at these Delta locations become less stringent under dryer conditions. Terminous, Jersey Point, and San Andreas dry water year objectives were met for calendar year 2013. However, the Emmaton dry water year objective of 0.45 millisiemens per centimeter (mS/cm) was not met for about 28 days. A portion of those days occurred after SWRCB staff agreed that critically dry water year objectives should be used for the remainder of the compliance period.

In the South Delta, the salinity objectives are based on a 30-day running average. The 1.0 mS/cm objective for the South Delta was met at Vernalis, Old River near Middle River, and Brandt Bridge. The objective was not met at Old River near Tracy Road Bridge for approximately 16 days. The 0.7 mS/cm objective for the South Delta was met at Vernalis, Old River near Middle River, and Brandt Bridge. The objective was not met at Old River near Tracy Road Bridge for approximately 83 days. The SWP and CVP

are jointly required by D-1641 to meet the agricultural EC objectives imposed at these South Delta compliance locations.

See also, Chapter 2, Delta Resources, and Chapter 7, Water Supply Development and Reliability.

### Estuarine Habitat Protection Standard

The estuarine habitat protection standard incorporates modified X2 criteria (geographic isohaline) first established in the 1994 Delta Smelt BiOp. The upstream movement of 2 parts per thousand isohaline (2 parts per thousand of salt in the water), measured as 2.64 mS/cm at the surface, is maintained within a certain range of positions in the estuary by adequate Delta outflow. These positions (Collinsville, Chipps Island, Port Chicago, or Martinez) are associated with an abundance of fish and biota.

The requirement for meeting X2 criteria at Collinsville applies to all days from February through June. The number of days per month when the daily average EC maximum (2.64 mS/cm) is in effect at Chipps Island or Port Chicago is conditioned by the previous month's Eight River Index. (The Eight River Index is the sum of the estimated unimpaired runoff from eight rivers—four in the Sacramento Valley [Sacramento River Region runoff] and four in the San Joaquin Valley [San Joaquin 4 Rivers runoff]. For more about runoff estimates, see Chapter 8, Water Supply.) This requirement may alternately be met with a maximum 14-day running average EC of 2.64 mS/cm or with specific Delta outflow, set as a 3-day average Net Delta Outflow Index (NDOI) of 7,100 cfs, 11,400 cfs, or 29,200 cfs, when the X2 position is at Collinsville, Chipps Island, or Port Chicago, respectively. The Port Chicago standard becomes effective when the Port Chicago 14-day EC average, immediately prior to the first day of the month, is less than or equal to 2.64 mS/cm.



The Eight River Index for January through May 2013, in million acre-feet, was 1.34, 1.08, 1.71, 2.02, and 1.43, respectively. The X2 habitat protection objective at Chipps Island was 28 days in February, 18 days in March, 19 days in April, 1 day in May, and 0 days in June. The X2 habitat protection objective at Port Chicago was not in effect in 2013. The X2 objectives were met in calendar year 2013 for Collinsville and Chipps Island.

### Net Delta Outflow Index Standard

Delta outflow cannot be measured directly due to the tidal influence in the Delta. Instead, an approximation of Delta outflow is calculated using measured inflows, exports, and estimated Delta water use. The NDOI was introduced in the 1995 Bay-Delta Plan and is now part of D-1641. NDOI calculates Delta outflow using inflows of the Sacramento River, the Yolo Bypass system, the eastside stream system (consisting of the Mokelumne, Cosumnes, and Calaveras rivers), the Sacramento Regional Treatment Plant, and a measurement of San Joaquin River flow at Vernalis.

Excess outflow conditions, as defined by the Coordinated Operations Agreement, allow for greater flexibility in project operations.

D-1641 sets specific minimum monthly NDOI standards for the protection of fish and wildlife based on water year type. In 2013, the monthly mean NDOI was highest in January, averaging 22,973 cfs. The lowest monthly mean NDOI occurred in October, with 4,156 cfs. All NDOI standards were met in 2013.

### River Flow Standards

D-1641 includes minimum flow requirements measured in the Sacramento River at Rio Vista. These flow standards, incorporated from the winter-run salmon BiOp, set flow requirements based on the Sacramento Valley water year classification. Water year

2012–2013 was dry, requiring mean monthly flows of 4,000 cfs for October and 4,500 cfs for November and December. During these periods, the 7-day running average could not be more than 1,000 cfs below the monthly standard. The actual mean monthly flows were 7,169 cfs in September; 4,168 cfs in October; 5,325 cfs in November; and 6,216 cfs in December.

D-1641 also specifies minimum flow requirements measured in the San Joaquin River at Vernalis. These flow standards are based on the San Joaquin Valley water year classification, which was critical for water year 2012–2013. If the X2 objective is required to be at or west of the Chipps Island location, critical year base Vernalis flows are set at 1,140 cfs from February to April 14 and from May 16 through June 30. The base-flow objective is relaxed to 710 cfs when X2 is required to be east of Chipps Island.

D-1641 requires the San Joaquin River spring pulse flow for April 15 to May 15 at Vernalis. This spring pulse flow requirement varies based on the location of X2 during April. However, the CALFED Operations Group may vary the actual timing and duration of the pulse attraction flow based on real-time monitoring data.

Additional information about San Joaquin River water quality can be found in Chapter 5, Local Assistance.

### Export Standards

D-1641 includes an export limitation for the SWP and CVP. It limits Delta exports to a ratio of Delta inflow to combined water project exports and is expressed as a maximum export rate in percentage of Delta inflow.

The actual export amount is calculated using the 3-day average that combines the inflow rate for Clifton Court Forebay (excluding Byron-Bethany Irrigation District

diversions from Clifton Court Forebay) added to the Jones Pumping Plant diversion. The export-to-inflow ratio limit is reported as either a 3-day or 14-day running average. A 14-day running average of inflows is used unless storage withdrawals from upstream reservoirs are being made for export, in which case a 3-day average of inflows is used. For all water year types, the maximum combined export rate from February through June is 35 percent of Delta inflow. This rate may be relaxed in February during years with less precipitation to between 35 and 45 percent. From July through January, the export-to-inflow ratio rises to 65 percent.

The 2008 USFWS and the 2009 National Marine Fisheries Service BiOps typically control the export rate most of the winter and spring. Under these conditions the Delta can be pushed into excess conditions more often. Additional information about the BiOps can be found in Chapter 3, Environmental Programs.

During 2013, the Delta was in excess conditions from January 1 to March 12, March 21 to April 2, and April 17 to April 24, for a total of 92 days. Within this period, combined SWP and CVP exports averaged about 23 percent of Delta inflow, meeting the 65 percent limitation in January and from July to December, while also meeting the 35 percent limitation from February to May.

The Delta was in balanced conditions from March 13 to March 20, April 3 to April 16, and from April 25 to December 31, for a total of 273 days. Within this period, combined SWP and CVP exports averaged about 32 percent of Delta inflow, meeting both the 35 percent and 65 percent limitations.

## South Delta Temporary Barriers Project

The South Delta Temporary Barriers Project, initiated as a test project in 1991, was extended for 5 years in 1996, and extended

again for 7 years in 2001. The project was created partially in response to a 1982 lawsuit filed by the South Delta Water Agency and consists of rock barriers across four South Delta channels.

These temporary seasonal barriers are designed to improve local water levels and circulation patterns, protect fishery resources, and improve water quality. They are placed across Middle River, Old River near Tracy, Grant Line Canal, and at the Head of Old River.

For more information about the temporary barriers, see Chapter 2, Delta Resources, and Chapter 3, Environmental Programs.

## Delta Mercury Control Program and Mercury Monitoring and Evaluation

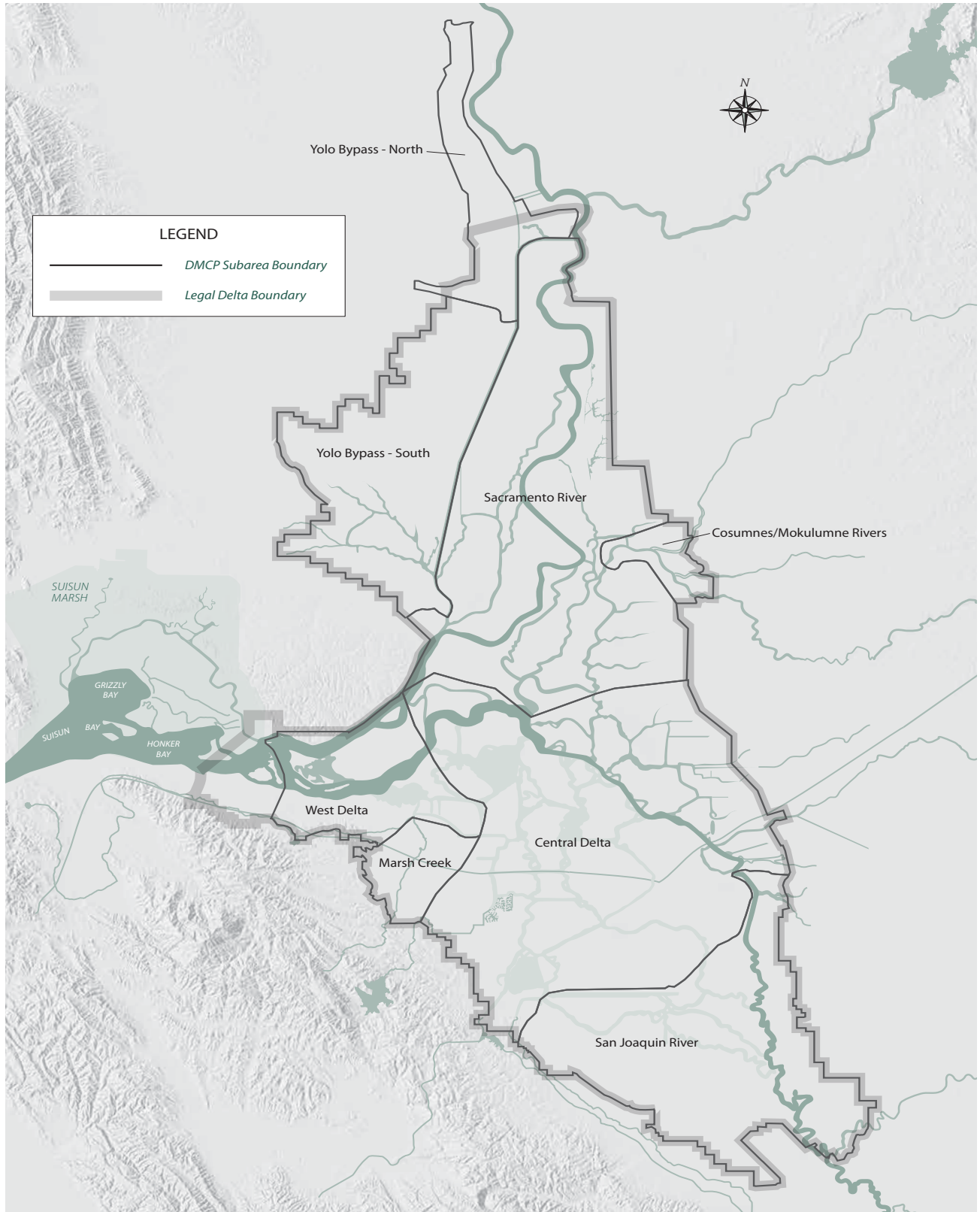
### Background

DWR's Mercury Monitoring and Evaluation (MME) Section was established in 2012 in the Division of Environmental Services to ensure that DWR is meeting its Delta Mercury Control Program (DMCP) regulatory compliance responsibilities.

The DMCP was adopted by the Central Valley Regional Water Quality Control Board (RWQCB) in 2010 to address mercury (Hg) and methylmercury (MeHg) water quality impairments in the Delta. The DMCP subareas subject to regulation are (see Figure 4-2):

- Yolo Bypass - North;
- Yolo Bypass - South;
- Sacramento River;
- West Delta;
- Marsh Creek;
- Central Delta;
- San Joaquin River; and
- Cosumnes/Mokelumne Rivers.





**Figure 4-2 Delta Mercury Control Program Subareas Subject to Regulation**

The DMCP includes fish tissue objectives for the Delta and MeHg load allocations to meet fish tissue objectives for National Pollutant Discharge Elimination System-permitted facilities, municipal storm water, agricultural lands, wetlands, and open water activities in the Delta and Yolo Bypass.

## Program Requirements

The DMCP impacts DWR through a number of regulatory requirements. These include the Central Valley RWQCB's regulatory authority over water quality certifications; the irrigated lands regulatory program, of which DWR is a member; general discharge requirements for dredging; and other water rights regulations. SWP activities primarily affected by the DMCP include the direct operation of the SWP and aquatic restoration and enhancement project activities that are required for compliance with the CVP and SWP long-term operations BiOps, the SWP Longfin Smelt incidental take permit, and the Fish Restoration Program Agreement. MeHg management is also part of the Bay Delta Conservation Plan's conservation measures.

To comply with the load allocation, different load reductions are required for each regulated activity and region. Depending on the region and activity, MeHg loads, in some areas, must be reduced by more than 80 percent from current levels; however, management practices that lead to measurable MeHg load reductions are not well defined. Therefore, the DMCP uses a phased implementation approach for regulated entities to follow.

Phase 1 is primarily a study period when MeHg control measures are developed and evaluated. Control study results must be submitted to the RWQCB by October 2018. Between October 2018 and approximately 2020, the RWQCB will review the study results and will consider revising the fish tissue objectives and MeHg allocations.

Phase 2, which begins after the RWQCB conducts its reevaluation of the fish-tissue objectives and waste load and load allocations, will require implementation of the MeHg controls identified by the Phase I studies.

## Ongoing Work

In 2013, staff continued to work in the four areas that require DWR DMCP compliance: wetlands, open water, dredging, and the Mercury Exposure Reduction Program (MERP), an educational outreach program.

In addition to DMCP duties, staff began tracking developments associated with the Statewide Mercury Policy to control mercury in California's waters. In March 2012, the SWRCB held a California Environmental Quality Act public scoping meeting introducing the Statewide Mercury Policy and a Statewide Mercury Control Program for Reservoirs. An update was also provided on the Statewide Fish Tissue Objectives Project, a closely related project to develop MeHg fish tissue objectives. The SWRCB asked for comments from the public on the scope, content, and potential environmental effects of the proposed policy and control program. Following the scoping meeting, staff from the MME Section and other DWR divisions provided comments to the SWRCB.

The statewide policy is designed to provide overall structure for adopting water quality objectives, general implementation requirements, and control plans for mercury-impaired water bodies. The policy will provide the framework for mercury control programs in California's inland waters.

Currently, seven DWR reservoirs are listed on the federal Clean Water Act Section 303(d) list as impaired for fish consumption due to MeHg concentrations in fish tissues:

- Lake del Valle;
- Lake Oroville;

- Thermalito Afterbay;
- Castaic Lake;
- Pyramid Lake;
- O'Neill Forebay; and
- San Luis Reservoir.

## Completed Work

The following are highlights of the DMCP Phase 1 work completed in 2013 for each of DWR's regulated activities and MME staff participation in the development of the Statewide Mercury Policy.

### *Control Study Workplan for Wetlands*

Tidal wetland control study workplan production that began in 2012 continued in 2013. DWR staff coordinated with DFW and produced two final workplans focusing on fresh and brackish water tidal wetlands. Both workplans were submitted to the RWQCB in April 2013. The decision to focus on tidal wetlands, as opposed to seasonal or permanent wetlands, was based on several factors:

- future restoration efforts will focus heavily on tidal wetlands (for example, the Bay Delta Conservation Plan and the Fish Restoration Program Agreement), rather than managed or permanent wetlands;
- few studies have focused specifically on MeHg production in tidal wetlands, and even fewer on MeHg production in fresh and brackish water tidal wetlands;
- current wetland allocations may overestimate tidal wetland contributions because tidal wetlands are structurally and ecologically very different than the permanent wetland used for allocation calculations; and
- understanding tidal wetland load production could lead to a change in the load allocations affecting DWR.

The objectives of both workplans are similar; however, one set of control studies targets

smaller, individual wetlands, while the second is a broader-scale study that focuses on Liberty Island in the lower Yolo Bypass, with the goal of determining if results gained from studying Liberty Island can be applied to tidal wetlands throughout the DMCP area.

The control study focusing on individual tidal wetlands has three objectives. They are to:

- determine if tidal wetlands are net sinks or sources of MeHg and Hg;
- determine the MeHg and Hg loads imported and exported from tidal wetlands; and
- provide data to the RWQCB for possible revisions of the MeHg load allocations for tidal wetlands.

The objectives of the control study focusing on Liberty Island are to:

- determine if the lower Yolo Bypass is a net sink or source of MeHg and Hg;
- determine major source and sink processes for MeHg in the lower Yolo Bypass by measuring MeHg and Hg in the dissolved and particulate phase; and
- provide data to the RWQCB for possible revisions of the MeHg load allocations.

At the end of July 2013, DWR and DFW received written comments from the RWQCB and the technical advisory committee retained by the RWQCB. Revised workplans were developed, with DWR assuming responsibility for conducting control studies associated with an individual wetland, and DFW assuming responsibility for conducting control studies focusing on Liberty Island. A revised workplan was submitted to the RWQCB on December 20, 2013.

### *Control Study Workplan for Open Water*

Production of the open water control study workplan was started by the open water workgroup in 2012 and continued in 2013. The open water workgroup consists of DWR

and the other entities regulated under the open water DMCP regulation (the California State Lands Commission, the Central Valley Flood Protection Board, the U.S. Army Corps of Engineers, and Reclamation). A technical work team provides technical support. DWR staff manages the open water workgroup and technical team. The DMCP requires open water regulated entities to evaluate their activities to determine whether operational changes or other practices or strategies could be implemented to reduce ambient MeHg concentrations in Delta open water areas and floodplain areas inundated by managed floodplain flows.

In 2012, the open water workgroup evaluated several hydrodynamic and mercury models to determine which could best provide information for the Delta and the Yolo Bypass. DWR's Delta Simulation Model 2 (DSM2) hydrodynamic model was chosen for the Delta. DSM2 does not extend into the Yolo Bypass; however, DWR is currently in the process of developing a hydrodynamic model for the Yolo Bypass. For the Yolo Bypass, a mercury model was chosen after soliciting concept proposals from several consultants. For the Delta it was determined that Hg algorithms would be incorporated into DSM2. It was determined that this hydrodynamic model, coupled to an Hg model, would be used by the open water workgroup.

In 2013, the open water workgroup and technical team produced the open water workplan and submitted it to the RWQCB on April 20. The objectives of the open water workplan were to:

- provide working models for Hg and MeHg supply, transport, and fate in the open waters of the Delta and Yolo Bypass;
- apply the models to identify processes governing MeHg supply to the Delta and Yolo Bypass; and
- apply the models to examine the potential impacts of proposed operational

changes in water management and flood conveyance in the Delta and Yolo Bypass on MeHg supply, and compare it to total maximum daily load allocations.

Empirical data will be used to help meet the objectives. This will include collecting sample data in the Yolo Bypass and the laboratory to develop a better understanding of fundamental MeHg processes in flooding events.

At the end of July 2013, the open water workgroup received written comments from the RWQCB and the technical advisory committee retained by the RWQCB. A revised workplan and a technical memorandum providing detailed information on the modeling and field approaches were submitted to the RWQCB by the December 20, 2013, deadline. The revised workplan removed much of the laboratory work in favor of large mesocosm (scale-model working ecosystem) experiments to generate rate constants for the model.

Additional funding and technical support for modeling and field activities were acquired in 2013.

In September 2013, DWR and consultant modelers met to begin solidifying modeling approaches and integrating work between the two modeling groups. Monthly modeling meetings were also started and facilitated by MME Section staff.

### ***Dredging Study Workplan***

Regulated dredging entities are required to submit study workplans to the RWQCB for evaluating MeHg and Hg discharges from dredging and dredge material reuse to develop and evaluate management practices to minimize increases in MeHg and Hg discharges.

In 2013, MME staff completed their DWR-wide survey, documenting that DWR



currently does not have any active or anticipated dredging within the Phase 1 time period. Based on survey results, MME staff worked with RWQCB staff to reach an agreement on DWR's responsibilities under the dredging section of the DMCP. RWQCB staff agreed that all DMCP dredging workplan and reporting requirements did not apply to DWR. In October 2013, DWR sent a letter to this effect to the RWQCB.

### ***Mercury Exposure Reduction Program***

The objective of the MERP is to reduce mercury exposure of Delta fish consumers most likely affected by mercury. The DMCP required regulated entities, either individually, collectively, or based on the Exposure Reduction Strategy, to submit an Exposure Reduction workplan for RWQCB approval by October 20, 2013.

In 2013, MME staff participated in the MERP workplan process, and the workplan was finalized in October 2013.

### ***Statewide Mercury Control Policy and Mercury Control Program for Reservoirs***

In 2013, the RWQCB began outreach to interested stakeholders to seek input and participation in their proposed implementation approach to reduce MeHg concentrations in fish tissues of impacted reservoirs. DWR staff participated in an outreach effort focusing on reservoir owners and operators within the jurisdiction of the San Francisco RWQCB. DWR's Lake del Valle falls within this jurisdictional boundary and, based on fish tissue levels, is listed under federal Clean Water Act Section 303(d) as mercury impaired.

## **Special Study and Biological Surveys**

DWR conducts several special studies and biological surveys each year. This includes a special study in the Stockton Deep

Water Ship Channel (DWSC) during the late summer and early fall to monitor the occurrence of low DO levels. Low DO levels potentially cause physiological stress to fish and block the migration of salmon into the San Joaquin River. DWR also conducts biological surveys of benthic organism density and diversity and of phytoplankton biomass and community composition in the Sacramento-San Joaquin Delta, Suisun Bay, and San Pablo Bay.

### **Fall Dissolved Oxygen Study in the Stockton DWSC**

Historically, during the late summer and early fall, DO levels in the eastern and central portions of the Stockton DWSC have dropped below both the 5.0 mg/L and 6.0 mg/L water quality objectives set by SWRCB and the RWQCB, respectively. These low DO levels are a result of several factors, including low San Joaquin River inflows, water temperatures, high biochemical oxygen demand, reduced tidal circulation, and intermittent reverse flow conditions in the San Joaquin River at Stockton.

To help reduce the severity of these low DO conditions, DWR normally installs a temporary rock barrier across the Head of Old River during periods of projected low fall flows in the San Joaquin River.

In 2013, the spring barrier was not installed due to uncertainty about the benefits of the barrier to migrating salmonid survival through the Delta. The fall barrier at the Head of Old River was not installed in 2013 because the existing flows and DO levels in the San Joaquin River were sufficient for Chinook Salmon, and it was not requested by DFW.

### ***Methods***

Monitoring DO concentrations in the Stockton DWSC was conducted by boat on 12 monitoring runs, from June 6 to November 20, 2013. During each run,



14 sites were sampled at low-water slack tide from Prisoners Point in the Central Delta to the Stockton Turning Basin at the terminus of the ship channel. Because monitoring results differ within the channel, sampling stations were grouped into western, central, and eastern regions. The western region of the channel begins at Prisoners Point and ends at Columbia Cut. The central region of the channel begins one-half mile east of Columbia Cut and ends at Fourteen Mile Slough. Finally, the eastern region of the channel begins at Buckley Cove and ends at Rough and Ready Island. The turning basin is unique within the channel because it is east of the entry point of the San Joaquin River into the channel and isolated from down-channel flows.

### Results

During the period of this study, DO levels varied by season and exhibited similar ranges between regions within the channel excluding the turning basin. The overall study period range was 5.8 to 9.3 mg/L at the surface and 5.5 to 9.2 mg/L at the bottom. In the western portion of the channel, DO concentrations ranged from 6.8 to 9.3 mg/L at the surface and 6.9 to 9.2 mg/L at the bottom. In the central portion of the channel, DO concentrations were variable, ranging from 6.1 to 9.2 mg/L at the surface and 6.1 to 9.0 mg/L at the bottom. In the eastern portion of the channel, DO levels were similar to the other regions, ranging from 5.8 to 9.3 mg/L at the surface and 5.5 to 9.0 mg/L at the bottom. In 2013, DO concentrations never fell below the 5.0 mg/L or 6.0 mg/L objectives.

Higher San Joaquin River inflows, as well as the absence of intermittent reverse flows near Stockton, coincided with improved DO conditions. Further monitoring operations for the fall 2013 special study were suspended after November 20.

### Benthic Survey

The operation of the SWP can impact flow characteristics of the upper San Francisco Estuary and subsequently influence the density and distribution of benthic biota. Benthic biota are relatively long-lived and can respond to changes in physical factors within the estuary, such as fresh water inflows, salinity, and substrate composition. The benthic monitoring program documents changes in the composition, abundance, density, and distribution of the benthic biota within the estuary. Biological surveys conducted under the benthic monitoring program provide an indication of physical changes occurring within the upper estuary. In addition, benthic monitoring data are also used to detect and document the presence of newly introduced species within the upper estuary.

Benthic monitoring was conducted at 10 sampling sites distributed throughout the major habitat types within the estuary:

- Clifton Court Forebay Intake;
- San Joaquin River at Buckley Cove and at Twitchell Island;
- Old River opposite Rancho del Rio;
- Sacramento River below the Rio Vista Bridge and above Point Sacramento;
- Suisun Bay at Bulls Head Point;
- Grizzly Bay at Dolphin near Suisun Slough; and
- San Pablo Bay near Pinole Point and near the mouth of the Petaluma River.

Four bottom grab samples for benthic analysis and one sample for sediment analysis were collected monthly at each site during 2013. Samples were analyzed to identify organisms to the lowest possible identifiable taxon and to count all organisms collected.

DWR maintains a database of benthic organisms located within the upper estuary. The benthic database is dynamic and

regularly undergoes peer review and update. When a new organism is identified at any of the sampling stations it is added to the database. In addition, the taxonomic names of organisms on the list are updated when sufficient evidence is produced to warrant such changes.

The benthic monitoring program collects a large number of organisms, but a relatively small number of species. A total of 183 species of benthic macrofauna were collected in 2013 at the 10 sampling sites. Of the 183 species, 10 represented 86 percent of all organisms collected:

- amphipods: *Ampelisca abdita*, *Americorophium spinicorne*, *Corophium alienense*, and *Gammarus daiberi*;
- Asian clams: *Potamocorbula amurensis* and *Corbicula fluminea*;
- sabellid polychaete: *Manayunkia speciosa*;
- tubificid worms: *Limnodrilus hoffmeisteri* and *Varichaetadrilus angustipenis*; and
- ostracod: *Cyprideis sp. A*.

Of the 10 dominant species, *Potamocorbula amurensis* and *Ampelisca abdita* represent macrofauna that inhabit a typically high saline environment and were found in San Pablo Bay, Suisun Bay, and Grizzly Bay. *Corophium alienense* and *Americorophium spinicorne* tolerate a wider range of salinity. They were collected both in the higher saline western sites and the more brackish to fresh water eastern sites such as the San Joaquin River at Twitchell Island and the Sacramento River above Point Sacramento. The remaining six species, *Gammarus daiberi*, *Manayunkia speciosa*, *Limnodrilus hoffmeisteri*, *Varichaetadrilus angustipenis*, *Corbicula fluminea*, and *Cyprideis sp. A* are predominantly fresh water species and were collected at sites east of Suisun Bay.

## Phytoplankton and Chlorophyll *a* Survey

Phytoplankton are small, free-floating or attached algae that can be tiny, single-celled organisms (less than 5 micrometers in diameter) or larger colonial organisms. Phytoplankton are an important source of food in the estuary for zooplankton, invertebrates, and some species of fish. Phytoplankton biomass is an indicator of the status of primary productivity in the estuary. Chlorophyll *a* is one of the main groups of pigments contained in the algal species that make up phytoplankton.

Monthly sampling of chlorophyll *a* concentrations and phytoplankton was conducted in 2013 by DWR's Bay-Delta Monitoring Branch at 13 stations throughout the upper San Francisco Estuary:

- Sacramento River at Greene's Landing/Hood and above Point Sacramento;
- San Joaquin River at Vernalis, Buckley Cove, and Potato Point;
- Old River opposite Rancho del Rio;
- Disappointment Slough near Bishop Cut;
- Frank's Tract near Russo's Landing;
- Suisun Bay at Bulls Head Point near Martinez and off Middle Point near Nichols;
- Grizzly Bay at Dolphin near Suisun Slough; and
- San Pablo Bay near Pinole Point and near the mouth of the Petaluma River.

Chlorophyll *a* concentration was measured at the 13 monitoring stations to estimate overall phytoplankton biomass in the estuary. Phytoplankton samples were collected and analyzed separately to determine which species were present in the estuary.

Monthly chlorophyll *a* concentrations throughout much of the estuary were relatively low. Of the 155 samples taken

in 2013, 89.7 percent (139 samples) had chlorophyll *a* levels below 10 micrograms per liter ( $\mu\text{g/L}$ ). Chlorophyll *a* levels below 10  $\mu\text{g/L}$  are considered limiting for zooplankton growth. Of the 16 samples with chlorophyll *a* concentrations above 10  $\mu\text{g/L}$ , one was from Frank's Tract near Russo's Landing in April; one was from the Sacramento River above Point Sacramento in March; two were from the San Joaquin River at Potato Point in April and September; three were from Disappointment Slough near Bishop Cut in April, September, and October; and nine were from the San Joaquin River at Vernalis from February through October. The mean chlorophyll *a* concentration for all samples in 2013 was 6.32  $\mu\text{g/L}$ ; the median value was 2.13  $\mu\text{g/L}$ . In 2012, the mean was lower (5.04  $\mu\text{g/L}$ ), but the median was similar (2.08  $\mu\text{g/L}$ ). The maximum chlorophyll *a* concentration in 2013 was 184.76  $\mu\text{g/L}$ , recorded in July on the San Joaquin River at Vernalis. It was slightly higher than the maximum in 2012 (131  $\mu\text{g/L}$ ). The minimum chlorophyll *a* concentration was 0.35  $\mu\text{g/L}$ , recorded in January in San Pablo Bay near the mouth of the Petaluma River.

Phytoplankton biomass and resulting chlorophyll *a* concentrations in some areas of the estuary may be influenced by extensive filtration of the water column by the introduced Asian clam, *Potamocorbula amurensis*. Well-established benthic populations of *P. amurensis* in Suisun and San Pablo bays are thought to have contributed to the low chlorophyll *a* concentrations (and increased water clarity) measured in these westerly bays since the mid-1980s.

In addition to monitoring for chlorophyll *a*, water samples were analyzed for pheophytin *a*.

Pheophytin *a* is a primary degradation product of chlorophyll *a*, and its relative concentration is useful for estimating the

general physiological state of phytoplankton populations. When phytoplankton are actively growing, the concentrations of pheophytin *a* are normally expected to be low in relation to chlorophyll *a*. The mean pheophytin *a* concentration for all samples in 2013 was 1.35  $\mu\text{g/L}$ , and the median value was 0.92  $\mu\text{g/L}$ . The maximum pheophytin *a* concentration was 12.05  $\mu\text{g/L}$ , recorded on the San Joaquin River at Vernalis in June. The minimum pheophytin *a* concentration was 0.15  $\mu\text{g/L}$ , recorded in San Pablo Bay near the mouth of the Petaluma River in January.

Centric diatoms, cyanobacteria, pennate diatoms, cryptomonad flagellates, and green algae constituted 99.8 percent of the organisms collected in 2013.

All organisms collected in 2013 fell into these 14 categories (in order of abundance):

- (1) centric diatoms (class Coscinodiscophyceae);
- (2) cyanobacteria (class Cyanophyceae);
- (3) pennate diatoms (classes Bacillariophyceae and Fragilariophyceae);
- (4) cryptomonad flagellates (class Cryptophyceae);
- (5) green algae (classes Chlorophyceae, Prasinophyceae, and Zygnematophyceae);
- (6) chrysophyte flagellates (class Chrysophyceae);
- (7) euglenoid flagellates (class Euglenophyceae);
- (8) dinoflagellates (class Dinophyceae);
- (9) xanthophyte flagellates (class Xanthophyceae);
- (10) raphidophyte flagellates (class Raphidophyceae);
- (11) unknown phytoplankton (classes unknown);
- (12) haptophyte flagellates (class Prymnesiophyceae);

- (13) coccolithophores (class Coccolithophyceae); and
- (14) silicoflagellates (class Dictyochophyceae).

The 10 most common genera collected in 2013 were:

- (1) *Cyclotella* (centric diatom);
- (2) *Chroococcus* (cyanobacterium);
- (3) *Leptolyngbya* (cyanobacterium);
- (4) *Entomoneis* (pennate diatom);
- (5) *Phormidium* (cyanobacterium);
- (6) *Aulacoseira* (centric diatom);
- (7) *Nitzschia* (pennate diatom);
- (8) *Pseudostaurosira* (pennate diatom);
- (9) *Navicula* (pennate diatom); and
- (10) *Cocconeis* (pennate diatom).

The large fall blooms of 2011 and 2012 did not repeat in 2013, though there were some chlorophyll *a* values over 10 µg/L recorded in the fall at some upstream stations.

Similar to 2012, there was a spring bloom of the pennate diatom *Entomoneis sp.*; however, the 2013 bloom occurred in March instead of May, and was located in the Sacramento River above Point Sacramento instead of Suisun Bay.

## Activities Outside the Delta

Routine SWP water quality monitoring activities and special studies are conducted outside the Delta. The special studies are in response to increasingly stringent regulations facing water purveyors who rely on DWR to deliver high-quality raw water. Most of these special studies were initiated because of fish and wildlife and water quality concerns held by agencies that provide domestic water service.

## Water Quality Monitoring in the SWP

DWR's Division of Operations and Maintenance monitors water quality throughout the SWP. This monitoring program has more than 40 sampling stations and analyzes more than 200 chemical, biological, and physical constituents. DWR operates monitoring stations at SWP storage and conveyance facilities located throughout the State, from the Feather River watershed in the north to Lake Perris in the south. Conveyance facilities include the Oroville Facilities, California Aqueduct with the East and West Branches, North Bay Aqueduct, South Bay Aqueduct, and the San Luis Joint-Use Complex. DWR collects and analyzes samples monthly at most stations, although the frequency can vary from weekly to annually depending on location, time of year, or special events. DWR sends the water samples to its Bryte Chemical Laboratory in West Sacramento for processing and analysis. Constituents analyzed include dissolved solids; nutrients; minerals such as chloride, sulfate, and sodium; trace metals; herbicides; pesticides; and organic substances.

DWR's water quality monitoring program also uses a network of 16 automated monitoring stations at key locations along the SWP. This network provides real-time data by continuously monitoring a variety of physicochemical parameters such as specific conductance, turbidity, pH, UV<sub>254</sub> (254 nanometer ultraviolet absorbance; measures dissolved organic carbon), and fluorometry (a measurement of algal biomass). SWP contractors rely on this essential data to assess the quality of water delivered by the SWP.

The water quality monitoring program is an important operational component of the SWP. DWR uses the data to evaluate water quality changes in the SWP, short- and long-term trends, and impacts from emergencies



such as spills and pipe ruptures. DWR also utilizes the data to influence operations and to determine the quality of drinking water as defined by the California Department of Public Health (CDPH). The findings are disseminated through a variety of media including memos, network postings, conference calls, and email distribution. DWR periodically conducts special studies to investigate the impacts of specific incidents affecting SWP water quality. The special studies include non-SWP water turn-ins, floodwater inflows, hydrology, and Delta hydrodynamics. The Division of Operations and Maintenance posts a number of water quality reports on DWR's website.

During 2013, water quality was assessed monthly at eight SWP facilities and at the CVP's Delta-Mendota Canal (see Table 4-1). Specific conductance (EC) averaged 90 microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ) at Thermalito Afterbay; 332  $\mu\text{S}/\text{cm}$  at the North Bay Aqueduct, Barker Slough Pumping Plant; 584  $\mu\text{S}/\text{cm}$  at the Delta-Mendota Canal; and 492 to 522  $\mu\text{S}/\text{cm}$  in the California Aqueduct. Dissolved organic carbon was highest at the North Bay Aqueduct (5.3 mg/L), while concentrations in the California Aqueduct ranged from 2.7 to 3.9 mg/L. The North Bay Aqueduct exhibited higher levels of turbidity (25 NTU [nephelometric turbidity units]) compared with other locations. Mean arsenic concentrations ranged from 0.002 to 0.003 mg/L at all locations, except Thermalito Afterbay, which had no detectable arsenic (<0.001 mg/L). Bromide ranged from <0.01 mg/L at Thermalito Afterbay to 0.27 mg/L at Check 21. Water quality in the Oroville Facilities was very good with nondetectable to low levels of minerals, nutrients, and most minor elements. Alkalinity and total dissolved solid concentrations were 40 mg/L and 55 mg/L, respectively.

In 2013, DWR sampled for pesticides, herbicides, and other organic compounds in March, June, and September (see Table 4-2).

The concentrations of the detected herbicides ranged from 0.01 to 1.1  $\mu\text{g}/\text{L}$ . The herbicide simazine ranged from 0.02 to 0.06  $\mu\text{g}/\text{L}$  in the Delta-Mendota Canal and the SWP, except at Check 21 where it was not detected. Dacthal (DCPA) was reported at all locations. Metolachlor was detected at the North Bay Aqueduct, Delta-Mendota Canal, and Banks Pumping Plant. The chemical 2,4-dichlorophenoxyacetic acid (2,4-D) was detected at Banks Pumping Plant. Other detected pesticides were atrazine, diuron, and 2,4-dichlorophenylacetic acid (DCAA). Of the seven detected herbicides, DCAA had the highest concentration (1.1  $\mu\text{g}/\text{L}$ ), followed by 2,4-D and diuron (0.3  $\mu\text{g}/\text{L}$ ), metolachlor (0.1  $\mu\text{g}/\text{L}$ ), simazine (0.06  $\mu\text{g}/\text{L}$ ), atrazine (0.05  $\mu\text{g}/\text{L}$ ), and Dacthal (0.04  $\mu\text{g}/\text{L}$ ).

Additional SWP water quality data are available on DWR's website.

### Non-project Turn-ins

Non-SWP water can be admitted to the California Aqueduct for conveyance and redistribution. Non-SWP water is considered to be any input to the SWP for conveyance by the SWP that is not directly diverted from the Delta. According to California Water Code Section 1810, no agency may deny a transferor of water the use of a water conveyance which has unused capacity if fair compensation is paid. Inputs to the California Aqueduct from these sources are called turn-ins.

Turn-in water may be used for local redistribution or transfer to other water contractors. Participants of an approved turn-in program can use available aqueduct capacity to move candidate waters from a point of availability to a point of need. Groundwater substitutions can also be made whereby surface water diversions are reduced by replacing that water with a like amount of groundwater. In this manner, more surface water is made available for transfer to other users. These voluntary



**Table 4-1 Mean Water Quality at Selected SWP Grab Sample<sup>a</sup> Locations in 2013**

Constituent	Units <sup>b</sup>	Reporting Limit	California Aqueduct							
			North Bay Aqueduct, Barker Slough Pumping Plant	Delta-Mendota Canal Upstream of McCabe Road	Banks Pumping Plant	O'Neill Forebay Outlet (Check 13)	Kettleman City (Check 21)	Near Highway 119 (Check 29)	Tehachapi Afterbay (Check 41)	Devil Canyon Second Afterbay
Alkalinity	mg/L as CaCO <sub>3</sub>	1	99	85	72	76	75	72	72	77
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NR	NR
Arsenic	mg/L	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002
Beryllium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Bromide	mg/L	0.01	0.03	0.26	0.23	0.26	0.27	0.23	0.26	0.25
Calcium	mg/L	1	16	25	20	22	21	23	23	24
Chloride	mg/L	1	23	83	75	83	84	75	81	80
Chromium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	mg/L	0.001	0.002	0.001	0.001	0.001	0.001	<0.001	<0.001	0.002
Hardness	mg/L as CaCO <sub>3</sub>	1	99	127	108	114	109	109	103	109
Iron	mg/L	0.005	0.02	0.016	0.021	0.011	0.012	0.008	0.006	0.006
Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium	mg/L	1	14	16	14	15	14	12	11	12
Manganese	mg/L	0.005	0.015	0.005	0.009	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrite + Nitrate	mg/L as N	0.01	0.26	0.87	0.52	0.52	0.42	0.60	0.72	0.54
Organic Carbon, Dissolved	mg/L as C	0.5	5.3	3.7	3.9	3.7	3.7	3.2	2.7	3.1
Organic Carbon, Total	mg/L as C	0.5	6.1	3.8	4.2	3.8	3.7	3.1	2.8	3.4
Orthophosphate	mg/L as P	0.01	0.13	0.08	0.08	0.07	0.07	0.05	0.04	0.04
Phosphorus, Total	mg/L	0.01	0.2	0.11	0.1	0.09	0.08	0.07	0.07	0.07
Selenium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium	mg/L	1	28	64	56	60	61	62	61	60
Specific Conductance	µS/cm	1	332	584	492	516	521	504	522	521
Sulfate	mg/L	1	23	55	38	41	41	43	47	43
Total Dissolved Solids	mg/L	1	180	318	280	294	289	284	293	289
Turbidity	NTU	1	25	5	7	4	2	3	4	2
Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.004	<0.005	<0.005

<sup>a</sup> A grab sample is a single sample chosen to represent the conditions in a given matrix (usually natural water) at a specific location, depth, and time. All reported values for the listed constituents are the mean of laboratory analytical values of water sampled from January through December. The annual mean may be based upon 12 to 29 samples for the list of constituents. When one or more analytical results for a constituent are non-detect, the annual mean is calculated using "0" for the non-detect results.  
<sup>b</sup> mg/L = milligrams per liter; µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity unit; NR = No data recorded at this location.

**Table 4-2 Pesticides, Herbicides, and Other Organic Substances Detected in the SWP in 2013**

Sampling Location <sup>a</sup>	Sampling Station ID Number	Sample Date	Chemical Detected <sup>b</sup>	Concentration (µg/L) <sup>c</sup>
North Bay Aqueduct, Barker Slough Pumping Plant	KG000000	3/20/13	Dacthal (DCPA)	0.02
		3/20/13	Metolachlor	0.1
		3/20/13	Simazine	0.04
		6/19/13	Metolachlor	0.1
Delta-Mendota Canal upstream of McCabe Road	DMC06716	3/19/13	DCAA <sup>d</sup>	1
		3/19/13	Dacthal (DCPA)	0.02
		3/19/13	Diuron	0.25
		3/19/13	Simazine	0.04
		6/18/13	DCAA <sup>d</sup>	1.1
		6/18/13	Atrazine	0.02
California Aqueduct at Banks Pumping Plant	KA000331	6/18/13	Metolachlor	0.1
		3/20/13	Dacthal (DCPA)	0.02
		3/20/13	Diuron	0.3
		3/20/13	Simazine	0.04
		6/19/13	2,4-D	0.3
		6/19/13	Atrazine	0.05
		6/19/13	Dacthal (DCPA)	0.01
California Aqueduct at O'Neill Forebay Outlet (Check 13)	KA007089	6/19/13	Metolachlor	0.1
		3/19/13	Diuron	0.25
		3/19/13	Simazine	0.05
		6/18/13	Dacthal (DCPA)	0.01
California Aqueduct near Kettleman City (Check 21)	KA017226	6/18/13	Simazine	0.02
		3/19/13	Dacthal (DCPA)	0.02
California Aqueduct near Highway 119 (Check 29)	KA024454	3/19/13	Dacthal (DCPA)	0.02
		3/19/13	Simazine	0.06
		6/24/13	Dacthal (DCPA)	0.04
California Aqueduct at Tehachapi Afterbay (Check 41)	KA030341	3/20/13	Dacthal (DCPA)	0.02
		3/20/13	Simazine	0.06
		6/19/13	Simazine	0.03
California Aqueduct at Devil Canyon Second Afterbay	KA041323	3/20/13	Dacthal (DCPA)	0.02
		3/20/13	Simazine	0.05
		6/19/13	Simazine	0.02

<sup>a</sup> Water at these locations is normally sampled during March, June, and September.

<sup>b</sup> Only chemicals found in detectable amounts at the sampling stations are included in this table. Refer to the document entitled *Analytical Methods for Organic Chemicals* for a complete listing of all organic chemicals included in the laboratory analysis. The document is available on DWR's website.

<sup>c</sup> µg/L = micrograms per liter.

<sup>d</sup> DCAA = 2,4-dichlorophenylacetic acid

water transfers aid in supplying water to areas experiencing shortages, usually during periods of drought or years with below-normal runoff.

Participants of turn-in programs include both SWP and non-SWP contractors that bank groundwater and routinely convey it into the California Aqueduct at various locations. Although most non-SWP turn-ins to the aqueduct originate as groundwater from Kern and Kings counties, other waters include excess surface flows or floodwaters typically from southern Sierra Nevada watersheds. Surface water turn-ins have included excess floodwaters from the Kings River redirected through the Mendota Pool and pumped into the California Aqueduct.

Certain conditions must be met before a turn-in proponent can be given approval to convey water into the California Aqueduct. In accordance with California Water Code Section 1810, water may be conveyed or transferred via any unused capacity of the aqueduct provided that the comingled water does not result in degradation of water quality. The transfer must also be made without unreasonably affecting fish, wildlife, or other instream beneficial uses.

DWR established interim procedures and criteria to review turn-in proposals and determine their approval for acceptance into the aqueduct using a two-tiered approach. According to the policy, the proponent of any turn-in proposal shall demonstrate that the water is of consistent, predictable, and acceptable quality. Prospective turn-in entities are required to submit proposals describing their turn-ins, including information such as detailed water quality monitoring and analyses, source water description, identification of wells, inflow rates, and duration. Tier 1 programs have “no adverse impacts” based on historical water quality in the California Aqueduct. Programs meeting Tier 1 criteria are approved by DWR without referral to the

State Water Contractor Facilitation Group for outside review. Proposals are classified as Tier 2 programs when turn-in water quality is generally lower than historical aqueduct conditions and it has the potential to cause adverse impacts. Tier 2 programs are referred to the State Water Contractor Facilitation Group for review. The facilitation group consists of DWR and representatives from each water contractor that chooses to participate. The group reviews Tier 2 proposals based on merits, impacts, mitigation, water quality monitoring, cost, benefits, or other issues. The group then provides recommendations to DWR regarding proposal approval. Staff at DWR consider all factors before making a decision on any turn-in proposal.

A total of 336,857 acre-feet (af) of non-SWP turn-in water was admitted to the California Aqueduct in the San Luis and San Joaquin field divisions during 2013 (see Table 4-3). Monitoring of constituents of concern showed aqueduct water quality was affected, both positively and negatively, but the effects were sometimes inconsistent and depended on a variety of factors such as water quality parameters, turn-in source, and relative flows.

In the San Luis Field Division, 11,672 af of surface water from the San Joaquin Valley was pumped into the California Aqueduct. The inflows usually did not result in substantial changes in water quality due, in part, to low relative inflows. Regardless of this, consistent, low-level increases were observed for parameters such as sulfate, chloride, and salinity, none of which exceeded drinking water maximum contaminant level concentrations. Nitrate concentrations consistently declined due to the inflows.

In the San Joaquin Field Division, 325,185 af of groundwater was pumped into the California Aqueduct from Kern Water Bank Canal (55 percent of the total), Semitropic

**Table 4-3 Turn-ins to the California Aqueduct in 2013**

Groundwater Source	Amount (acre-feet)
Kern Water Bank Authority, Kern Water Bank Canal	177,751
Semitropic Water Storage District	64,651
Cross Valley Canal	42,957
Arvin-Edison Water Storage District	33,205
Wheeler Ridge-Maricopa Water Storage District	5,361
West Kern Water District	1,260
Westlands Water District	11,672
<b>Total</b>	<b>336,857</b>

Water Storage District (20 percent), Cross Valley Canal (13 percent), Arvin-Edison Water Storage District (10 percent), Wheeler Ridge-Maricopa Water Storage District (1.7 percent), and West Kern Water District (0.4 percent).

Overall, arsenic, chromium (total and hexavalent), nitrate, and sulfate, consistently increased in the aqueduct, although their respective drinking water maximum contaminant levels were not exceeded. The greatest increases occurred during the last few months of the year and were principally attributable to Semitropic Water Storage District’s elevated concentrations and large inflow volumes. Dissolved organic carbon declined in the aqueduct during most months. This was a benefit for SWP water contractors because it reduces the cost of treating SWP water for drinking purposes and reduces the potential for exceeding trihalomethane regulatory limits. For bromide, chloride, nitrate, and total dissolved solids, increases or decreases depended on factors such as month, location, and sometimes relative inflow. The changes in concentration of these parameters in the aqueduct were, in many cases, within the range of natural seasonal variation occurring upstream. Additional information and analysis will be in the upcoming report, *Water Quality Assessment of Non-Project Turn-ins to the California Aqueduct, 2013*.

## San Joaquin Valley Agricultural Water Quality Programs

There are a number of programs that conduct or support monitoring, research, training, or demonstration projects related to San Joaquin Valley agricultural water quality. For information about these programs, see Chapter 5, Local Assistance.

## Municipal Water Quality Program Branch

The Sacramento-San Joaquin Delta provides drinking water for more than 25 million people in California. The Division of Environmental Services, Municipal Water Quality Program (MWQP) is responsible for evaluating the suitability of Delta water as a drinking water source, identifying sources of water quality degradation, and ensuring water quality data meet quality assurance and quality control objectives.

The mission of the Municipal Water Quality Investigations (MWQI) Program is to:

- support the effective and efficient use of the SWP as a source water supply used for municipal purposes through monitoring, forecasting, and reporting SWP water quality;
- provide early warning of changing conditions in source water quality used for municipal purposes;
- provide data and knowledge-based support for operational decision-making on the SWP;
- conduct scientific studies of importance to drinking water; and
- provide scientific support to DWR, the State Water Project Contractors Authority-MWQI Specific Project Committee, and other interested parties.

## Real Time Data and Forecasting Comprehensive Program

The Real Time Data Forecasting Comprehensive Program (RTDF-CP) has become a central element of the MWQP. The goal of the program is to further develop the capability of real-time data collection and to forecast short- and long-term source drinking water quality conditions in the Delta and SWP. Within the MWQP, the RTDF-CP entails the following elements:

- real-time monitoring at key locations, providing stakeholders and interested parties with timely data;
- field operations that ensure proper operation of all automated sampling equipment;
- consistent modeling with continuous updates providing the best forecasts possible;
- quality assurance/quality control of the instruments and data; and
- centralized information management and dissemination.

The real-time monitoring network includes stations located at Banks Pumping Plant, Jones Pumping Plant, the Sacramento River at Hood, the San Joaquin River near Vernalis (McCune Station), and at the newly constructed station at Gianelli Pumping-Generating Plant at San Luis Reservoir.

## Quality Assurance/Quality Control Program

The Quality Assurance/Quality Control Program (QA/QC) was established in 1992 to ensure that data generated by DWR's environmental monitoring programs meet high quality standards and are scientifically defensible. This is accomplished by encouraging monitoring programs to follow standardized procedures including quality control measurements in their sampling protocols.

The program performs the following functions:

- publishes quality assurance/quality control guidance documents;
- develops and maintains the drinking water quality database and associated quality control metadata of the DWR Water Data Library; and
- assists with developing quality assurance project plans.

QA/QC, with assistance from the University of California, Davis Extension, organized and presented a class titled "Introduction to Environmental Statistics" on August 14–16, 2013.

In 2013, QA/QC staff performed quality review and data entry of remnant historical hardcopy water quality data from the Division of Operations and Maintenance into DWR's Water Data Library database. These data will be shared in the U.S. Environmental Protection Agency's nationwide Environmental Information Exchange Network.

Also in 2013, QA/QC staff assisted various environmental monitoring programs in developing quality assurance documents. These included quality assurance project plans for monitoring pathogens and emerging chemical constituents of concern from the Sacramento Regional Wastewater Treatment Plant and the Stockton Regional Wastewater Control Facility. These are the largest wastewater treatment plants in the Sacramento and San Joaquin river watersheds, respectively, and their effluents can potentially impact water quality in the South Delta where SWP facilities are located.

## Water Quality Special Studies

Special studies are conducted to investigate the origins, fate, transport, and in some cases loads of current and emerging contaminants of concern. Such studies help



determine where new instruments should be located. Special studies can also be used to:

- investigate seasonal patterns and trends of constituents or examine circulation patterns of contaminants;
- refine modeling assumptions; and
- assess the impacts of increasing urbanization on levels of water quality constituents of concern.

MWQI engages in special studies that focus on specific aspects of source waters, contaminant loading, measurement methods and instrumentation, and climate and hydrology. The following studies were in progress during the 2013 calendar year:

- Urban Sources and Loads Investigation of Lathrop, California;
- investigation of O'Neill Forebay water circulation;
- spectrofluorometer study;
- feasibility study for a portable water quality monitoring station;
- nutrient budget of the SWP;
- in-situ fluorometer measurements of dissolved organic matter; and
- MWQI Program Summary Report.

### Accomplishments for the 2012–2013 MWQI Work Plan

During the 2012–2013 work plan cycle, the MWQI accomplished the following goals:

- completed installing a water quality station at the Gianelli Pumping-Generating Plant;
- updated MWQP's 5-year strategic plan;
- completed short-term Sacramento Watershed Analysis Risk Management Framework monitoring;
- installed a Metrohm anion analyzer at the Gianelli water quality station;
- installed new replacement water quality monitoring equipment at the continuous

real-time water quality monitoring stations;

- commenced calibration and reporting limit studies on the new replacement water quality monitoring equipment;
- initialized version 2 of the Field Station Real Time Monitoring Standard Operating Procedures;
- completed the investigation of longitudinal dispersion rate and travel time of constituents in the SWP; and
- produced several projects to develop data for historical conditions for the Delta and Aqueduct models (DSM2 and DSM2 Aqueduct Extension Model of the SWP), as well as for the Watershed Analysis Risk Management Framework model development.

The special study reports and other MWQP publications can be found on DWR's website.

### Bryte Chemical Laboratory

Established in 1951, Bryte Chemical Laboratory is DWR's primary analytical laboratory. Its main function is to analyze drinking, surface, waste, and groundwater for the various water quality programs within DWR. Since 1990, the laboratory has been certified biennially by the SWRCB's Environmental Laboratory Accreditation Program to perform water quality analyses following U.S. Environmental Protection Agency or American Water Works Association procedures and analytical methods. This certification allows the laboratory to perform analyses that generate legally defensible data that can be used for regulatory or compliance purposes. The laboratory continues to perform the majority of chemical and other related analyses required to support DWR's water quality programs. Each year, thousands of water samples are routinely analyzed for inorganic and organic constituents such as standard minerals, cations, anions, nutrients, metals, chlorophyll, pesticides, herbicides, and volatile organic compounds.

In 2013, the laboratory upgraded its capability and capacity to detect and analyze alkalinity, conductivity, and pH with the purchase of a Metrohm 855 Autotitrator. It is a fully automated and computer-controlled instrument equipped with a 102-position autosampler and multiprobe detectors that generate data that are highly stable, accurate, and reproducible. The instrument's detection limit has been established at 1 part per million.

The laboratory has continued to manage a variety of analytical contracts with other State agencies and several outside laboratories in accordance with the master contract policy approved in fiscal year 1994–1995. These contracts are used to perform analyses that are beyond the capability and capacity of the laboratory, such as solids and fish tissues. On July 1, 2013, the California DFW was awarded the contract for water, fish tissue, and sediment analysis worth \$750,000 for 3 years.

SWP security and protection has continued to be a primary goal for DWR since September 11, 2001. To help protect the SWP from biochemical and chemical agents, the laboratory continues to be an active member in a group of laboratories called the California Association of Mutual Aid Laboratories Network (CAMAL Net) headed by CDPH. The laboratory network's main objective is to voluntarily assist CDPH in the analysis of chemical agents in water quality samples should a natural disaster or biochemical or chemical event occur in California. The assistance is only required should the analytical capacity of CDPH be exceeded or to confirm the presence or absence of chemical agents in water quality samples provided by CDPH. In 2007, Bryte Chemical Laboratory was classified as a Level II participating laboratory in the CAMAL Net organization. Level II only allows the laboratory to receive samples that are prescreened and determined nonhazardous to laboratory personnel.

## Suisun Marsh Program Activities

Suisun Marsh consists of approximately 59,000 acres of tidal and managed brackish water wetlands and 30,000 acres of bays and sloughs. It is the largest contiguous brackish marsh remaining in the United States. Situated in southern Solano County, west of the Sacramento–San Joaquin Delta and north of Suisun Bay, the marsh encompasses more than 10 percent of California's remaining natural wetlands. The marsh is the resting and feeding ground for thousands of waterfowl and shorebirds migrating on the Pacific Flyway. It provides important habitat for more than 221 bird species, 45 mammal species, 16 reptile and amphibian species, and more than 40 fish species.

DWR became involved in the Suisun Marsh in response to SWRCB Water Right Decision 1485, which required mitigation for effects of the SWP and CVP. The 1984 *Plan of Protection for Suisun Marsh*, completed by DWR, included construction of a series of facilities to distribute lower salinity water to managed wetlands and monitoring in relation to these facilities. Today, DWR operates and maintains these water management facilities, including the Roaring River Slough Distribution System (RRSDS), Morrow Island Distribution System (MIDS), Goodyear Slough Outfall, and the Suisun Marsh Salinity Control Gates (SMSCG). Figure 4-3 shows the water quality compliance and monitoring sampling locations and the water management facilities.

Through agreements and plans, DWR has been working in coordination with Reclamation, DFW, Suisun Resource Conservation District (SRCD), USFWS, and other agencies on habitat management, preservation, and restoration of the Suisun Marsh.

## Revised Suisun Marsh Preservation Agreement

In 1987, DWR, Reclamation, DFW, and SRCD signed the *Suisun Marsh Preservation Agreement* (SMPA). It required Reclamation and DWR to meet salinity standards as specified in the then-current SWRCB Water Right Decision 1485, set a timeline for implementing the *Plan of Protection for the Suisun Marsh*, and delineated monitoring and mitigation requirements. A revised SMPA and *Revised Mitigation and Monitoring Agreement* were signed in 2005 to make channel water salinity requirements consistent with D-1641. These included management activities in lieu of western marsh facilities proposed in the plan of protection.

The revised SMPA included the following actions: operate facilities in order to meet channel water salinity standards consistent with D-1641; implement a Water Manager Program; provide portable pumps; update Individual Ownership Adaptive Management Habitat Plans; establish a Drought Response Fund; and replace turnouts on the RRSDS. The monitoring agreement included monitoring for fish, Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*), Ridgway's Rail (*Rallus obsoletus*; formerly known as the California Clapper Rail), vegetation, and other biological monitoring.

During 2013, DWR, DFW, Reclamation, and SRCD continued to implement these activities. Negotiations continued for updating the revised SMPA to include the remaining mitigation obligations.

## Facility Operations, Maintenance, and Related Activities

### Morrow Island Distribution System

MIDS is an interior ditch bordered by levees that was created to distribute water to managed wetlands. Water with relatively lower salinity is taken from Goodyear Slough

in the west through water control structures that transport the water into MIDS. Water is then distributed to managed wetlands through private landowner water control structures along the ditch. Water not used by the landowners exits into Grizzly Bay through water control structures in the east.

**Fish Screen and Alternatives.** Based on previous study results, a fish screen at MIDS would likely have negligible benefits to sensitive fish populations (see Bulletin 132-07, Chapter 4, Water Quality). DWR and Reclamation are proposing to fulfill the outstanding terms and conditions of the USFWS 1997 BiOp for the MIDS maintenance project by acquiring and protecting, in perpetuity, aquatic habitat in Suisun Marsh. (For additional information about the BiOp, see Bulletin 132-08.) The status of this proposal remains on-going without new notable developments or changes.

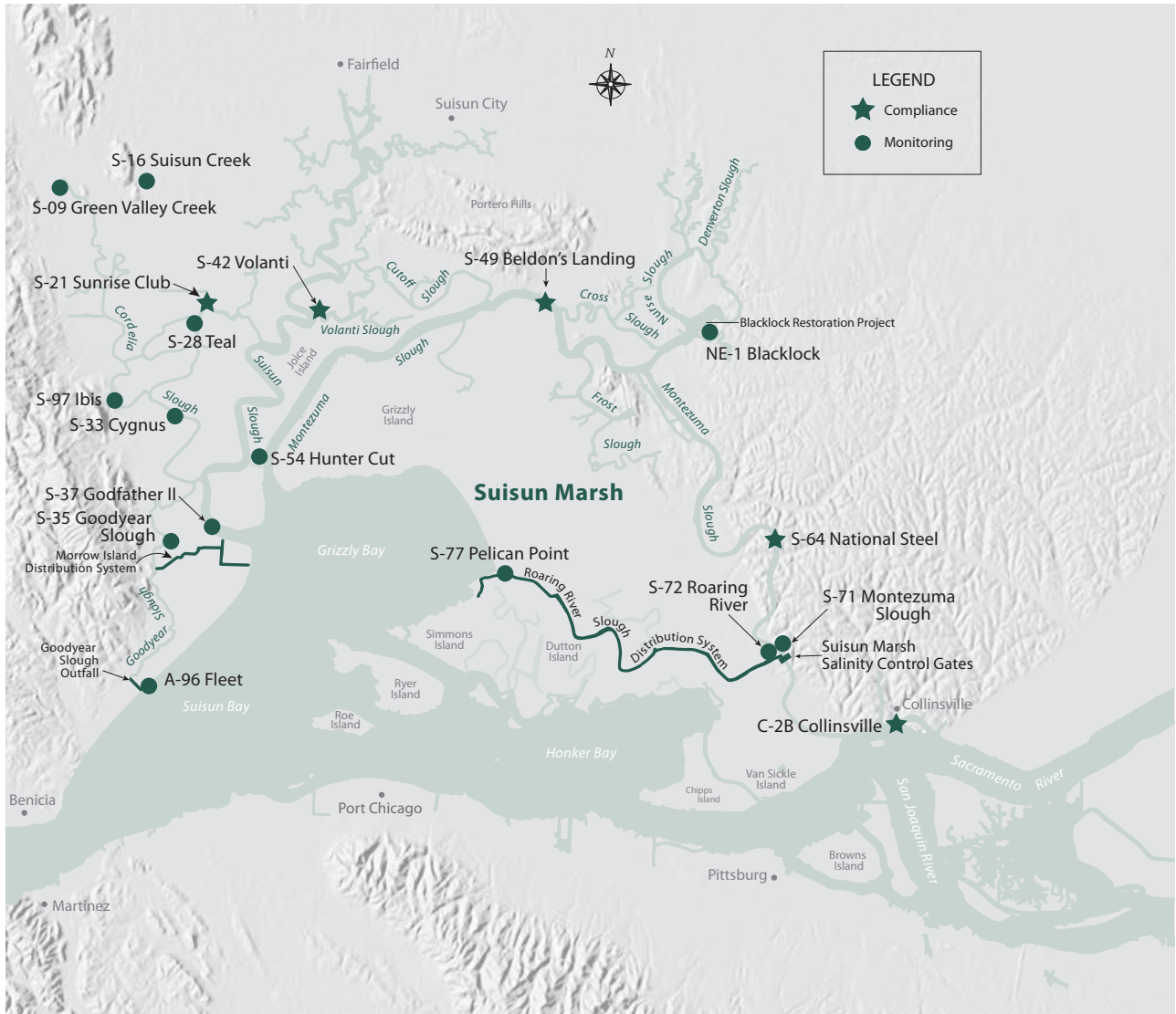
**Longfin Smelt Incidental Take Permit.** On February 23, 2009, DFW issued an incidental take permit for the on-going and long-term operation of existing SWP facilities in the Sacramento-San Joaquin Delta for the protection of Longfin Smelt. MIDS is included as one of these facilities.

To minimize the take of Longfin Smelt at the MIDS diversion, DFW specifies the average intake velocities each year to adequately protect these fish.

Also, as a requirement of the incidental take permit, DWR is developing a study to confirm that the aforementioned operation prevents or substantially reduces the entrainment of Longfin Smelt at MIDS.

**Morrow Lane Bridge Repair.** In July 2012, the Division of Engineering inspected the Morrow Lane Bridge over Goodyear Slough and found the bridge was severely deteriorated. As a result, access and maintenance of MIDS was suspended.





**Figure 4-3 Compliance and Monitoring Stations and Water Management Facilities in the Suisun Marsh**

During 2013, DWR worked with a landowner and consultant to determine how to proceed with bridge repairs. The landowner decided to address the deficiency in two phases. The first was a repair to extend the life of the bridge 1 to 2 years, and the second is a full replacement of the bridge (in fiscal year 2014–2015).

Structural repairs were made to the bridge in summer 2013. The Division of Engineering inspected the installed interim strengthening measures designed by the

consultant and determined that the bridge could safely support vehicles with loads up to 18,000 pounds per axle, allowing DWR staff access to MIDS for maintenance. Additionally, the Division of Engineering recommended that the bridge be inspected every 6 months to ensure the safety of DWR personnel.

**Suisun Marsh Salinity Control Gates**

The SMSCG are operated as needed to meet salinity standards. When they are not in operation, they are placed in an open

position to minimize fish concerns related to predation and impedance. Installation or removal of the flashboards and operation of the gates vary depending on salinity conditions, fisheries agencies' requests for sensitive species concerns, or repairs.

**Status of SMSCG in 2012–2013.** The control season (October 2012 through May 2013) began with the installation of the flashboards on October 9, 2012. The SMSCG were tidally operated between October 12 and November 27, 2012, due to salinity concerns in the marsh. The boat lock was partially closed during the control season due to safety concerns. The National Marine Fisheries Service was briefed about the safety concerns and agreed to assess options with DWR to balance fish and safety needs. On start-up on October 12, all three gates started operating remotely. After operating for 46 days, salinity decreased and gate operations were suspended on November 25, 2012. Salinity levels increased due to dry conditions in May, and radial gate operation began on May 2, 2013. On start-up, only two gates were operational; the third gate malfunctioned and was kept in the open position until it became operational on May 10. Gate operations lowered salinity sufficiently, and as a result, operations stopped on May 21. The flashboards were removed and the boat locks were closed on May 30, 2013.

### **Other Facility Operation and Maintenance**

The RRSDS and Goodyear Slough Outfall are operated and maintained as needed to provide lower salinity water to managed wetland properties. RRSDS 2013 maintenance activities included clearing the existing ditch at the southern end, replacing riprap on the interior ditch, levee repair and coring, road maintenance and grading, debris removal, and vegetation management. Goodyear Slough Outfall 2013 maintenance activities included debris removal from pipes and trash racks and vegetation management.

### **Water Quality and Compliance**

Salinity levels for the 2012–2013 control season were below monthly standards for all five compliance stations.

Details about salinity levels in the marsh are available in the monthly report entitled *Suisun Marsh Monitoring Program Channel Water Salinity Report* available on DWR's website.

### **Blacklock Restoration Project**

DWR received CALFED Ecosystem Restoration Program grant funds in 2001 to acquire the 70-acre Blacklock property in December 2003. DWR, in cooperation with Reclamation, DFW, USFWS, and SRCD, implemented the Blacklock Restoration Project (location shown on Figure 4-3). This project restored diked, managed wetlands to tidal wetlands. Although a natural breach in the levee occurred in July 2006, it was determined that the planned breach should still be constructed to allow for full tidal flow and optimum sediment transportation. The planned breach construction occurred on October 3 and 4, 2006.

The project goals and objectives are to:

- restore the area to a fully functioning, self-sustaining marsh ecosystem created through restoration of natural hydrologic, sedimentation, and biological processes;
- increase the area and contiguity of emergent wetlands providing habitat for tidal marsh species; and
- assist in the recovery of at-risk species.

The final restoration plan for the project was published in June 2007.

In 2013, DWR continued implementing the 10-year monitoring program at the Blacklock site. Monitoring is performed in cooperation with State and federal agencies. There are 15 parameters being monitored, including sediment accretion, channel network



evolution, vegetation development, water quality, methylmercury concentrations, and avian use.

In 2013, Wetlands and Water Resources, Inc. worked on the monitoring report for years one through five. The report is being finalized by DWR staff and is expected to be completed in early 2015.

For more information about the Blacklock Restoration Project, visit the Suisun Marsh Program webpage on DWR's website.

## Suisun Marsh Habitat Management, Preservation, and Restoration Plan

The *Suisun Marsh Habitat Management, Preservation, and Restoration Plan*, referred to as the Suisun Marsh Plan, was developed by the Principal Agencies (or Principals), a group of agencies with primary responsibility for Suisun Marsh management. The Suisun Marsh Plan is intended to balance the benefits of tidal wetland restoration with other habitat uses in the marsh by evaluating alternatives that provide a politically acceptable change in marshwide land uses, such as Salt Marsh Harvest Mouse habitat, managed wetlands public use, and upland habitat. It relies on the incorporation of existing science and information developed through adaptive management.

The Principals include USFWS, Reclamation, DFW, DWR, the National Marine Fisheries Service, and SRCD. The Principals have consulted with other participating agencies, such as the U.S. Army Corps of Engineers, the San Francisco Bay Conservation and Development Commission, the RWQCBs, and SWRCB, to develop this plan.

The Suisun Marsh Plan was published in May 2013.

Adaptive management is an important part of carrying out tidal restoration projects. In May 2013, an Adaptive Management

Advisory Team Charter was completed. It outlines the responsibility of the Suisun Marsh Plan agencies to encourage project proponents to carry out targeted studies to resolve uncertainties through monitoring, recommend adaptive management strategies, and share scientific information.

## Suisun Marsh Expenditure History

Suisun Marsh expenditures and reimbursements administered by DWR for calendar years 1968 through 2013 are summarized in Table 4-4. From 1968 through December 31, 2013, DWR disbursed more than \$150.6 million of SWP funds for planning, design, environmental documentation, construction, maintenance, monitoring, mitigation, and permit compliance in support of implementing the *Plan of Protection for the Suisun Marsh* through the SMPA and for meeting standards set by SWRCB. Reclamation has reimbursed DWR approximately \$54.7 million (36 percent), and the State's General Fund has reimbursed approximately \$9.5 million (6.3 percent). These figures do not include up-front payments made by Reclamation for staff and other direct costs, as well as approximately \$5.7 million in Reclamation interest payments during 1988 and 1989.

Annual figures are reported in Table 4-4 for DWR's up-front payments, Reclamation reimbursements, General Fund reimbursements, and DWR's cumulative expenditure balance.

**Table 4-4 Suisun Marsh Expenditures and Reimbursements Administered by DWR (in dollars), Calendar Years 1968–2013**

Year [1]	Reach 305 Costs [2]	General Fund Payment [3]	Adjustment for General Fund Payment <sup>a</sup> [4]	Reclamation Invoice Payment [5]	Interest Payment Credited Back to Contractors [6]	Net SWP Costs [2] through [6] [7]	Recreation Costs <sup>c</sup> [8]	SWP Water Contractors' Costs [7] minus [8] [9]
1968	10,571					10,571	359	10,212
1969	34,181					34,181	1,162	33,019
1970	23,343					23,343	794	22,549
1971	1,042					1,042	35	1,007
1972	47					47	2	45
1973	0					0	0	0
1974	0					0	0	0
1975	2,709					2,709	92	2,617
1976	32,960					32,960	1,121	31,839
1977	37,475					37,475	1,274	36,201
1978	350,831					350,831	11,928	338,903
1979	3,660,099					3,660,099	124,618	3,535,481
1980	5,005,759					5,005,759	170,772	4,834,987
1981	2,964,974					2,964,974	101,311	2,863,663
1982	2,955,705			(2,500,000)		455,705	101,111	354,594
1983	2,754,094					2,754,094	93,643	2,660,451
1984	2,418,344					2,418,344	82,388	2,335,956
1985	2,332,773					2,332,773	79,432	2,253,341
1986	6,495,322					6,495,322	220,843	6,274,479
1987	13,600,701					13,600,701	462,424	13,138,277
1988	7,456,364			(17,368,725) <sup>b</sup>	(2,039,752)	(11,952,113)	253,516	(12,205,629)
1989	2,341,960	(9,478,000)	6,634,600	(1,219,691) <sup>b</sup>	(283,857)	(2,004,988)	79,643	(2,084,631)
1990	3,030,010			(695,450)		2,334,560	101,460	2,233,100
1991	6,223,042			(2,925,429)		3,297,613	210,454	3,087,159
1992	2,737,259			(1,174,655)		1,562,604	91,951	1,470,653
1993	2,979,255			(238,130)		2,741,125	99,897	2,641,228
1994	3,192,213			(1,962,549)		1,229,664	107,281	1,122,383
1995	2,721,978			(647,138)		2,074,840	91,218	1,983,622
1996	3,391,678			(1,482,396)		1,909,282	113,244	1,796,038
1997	3,634,267			(1,520,219)		2,114,048	121,132	1,992,916
1998	5,342,834			(1,107,501)		4,235,333	177,132	4,058,201
1999	8,867,742			(2,696,200)		6,171,542	301,424	5,870,118
2000	2,857,534			(3,300,053)		(442,519)	98,145	(540,665)
2001	2,621,301			(444,009)		2,177,292	89,431	2,087,861
2002	3,752,486			(791,319)		2,961,167	124,386	2,836,780
2003	3,258,583			(2,389,979)		868,604	107,566	761,038
2004	2,874,629			(952,940)		1,921,689	94,885	1,826,804
2005	3,940,875			(1,409,296)		2,531,579	130,049	2,401,530
2006	5,789,380			(868,449)		4,920,931	193,258	4,727,673
2007	4,088,694			(939,879)		3,148,815	134,934	3,013,881
2008	3,810,705			(1,670,278)		2,140,427	125,239	2,015,189
2009	4,638,636			(1,123,705)		3,514,931	153,077	3,361,855
2010	2,800,303			(1,663,530)		1,136,773	92,410	1,044,363
2011	3,706,742			(1,748,136)		1,958,606	122,323	1,836,283
2012	6,311,949			(1,860,585)		4,451,364	208,294	4,243,070
2013	5,506,303					5,506,303	181,708	5,324,596
<b>Total</b>	<b>150,557,652</b>	<b>(9,478,000)</b>	<b>6,634,600</b>	<b>(54,700,241)</b>	<b>(2,323,609)</b>	<b>90,690,402</b>	<b>5,057,366</b>	<b>85,633,036</b>

<sup>a</sup> Under Assembly Bill 1442, the General Fund paid 20 percent of the Suisun Marsh costs through June 1988, which totaled \$9,478,000. This payment included \$2,843,400, which represents 6.5 percent of the costs through June 1988 paid by the General Fund. This amount has reduced the costs billed to the SWP water contractors. The remaining \$6,634,600 received from the General Fund represents DWR's recreation project purpose share of 14 percent.

<sup>b</sup> Excludes interest payments made by Reclamation.

<sup>c</sup> Allocation factors for capital recreation costs have changed from 14 percent to 3.4 percent, and operations and maintenance recreation costs from 14 percent to 3.3 percent.



## **Chapter 5**

### **Local Assistance**

*Artichoke crops in San Luis Obispo County.*

## Significant Events in 2013

The California Irrigation Management Information System (CIMIS) made significant improvements to data quality and availability in support of the Water Conservation Act of 2009 (Senate Bill [SB]X7 7), the Model Water Efficient Landscape Ordinance (MWELO).

Through the Integrated Regional Water Management (IRWM) Grant Program, the Department of Water Resources (DWR) awarded \$91.8 million in Stormwater Flood Management grants and \$4.7 million in Local Groundwater Assistance grants in 2013.

In October 2013, DWR released the draft report *Commercial, Industrial, and Institutional Task Force Water Use Best Management Practices*.

*Information in this chapter was contributed by the Division of Statewide Integrated Water Management, the Division of Environmental Services, and the Division of Integrated Regional Water Management.*

The Department of Water Resources (DWR) manages the Davis-Grunsky Act Program, water use efficiency, agricultural drainage, and Water Conservation Bond Law programs, and participates in several other programs that assist local agencies and benefit State Water Project (SWP) water contractors.

## Davis-Grunsky Act Program

The Davis-Grunsky Act, authorized in 1960 as part of the Burns-Porter Act, provides construction loans for local domestic water projects and agricultural water supply. It also provides grants for recreation and fish and wildlife enhancement. Additionally, loans and grants may be given to rehabilitate dams and reservoirs.

DWR's ongoing administration of Davis-Grunsky program loans and grants includes management and oversight of 32 recreation projects and contracts. Administration costs are recovered from revenues generated by repayment of Davis-Grunsky Act loans. Recreation grant contracts are being amended to reflect modification of DWR's fee oversight functions and actual construction of recreation facilities.

The Davis-Grunsky Act requires participating State agencies to operate and maintain the recreation projects, while DWR inspects the recreation facilities, monitors the recreation contracts, and maintains a list of the recreation projects.

## Water Use Efficiency

Activities of the Water Use and Efficiency Branch in the Division of Statewide Integrated Water Management include providing technical assistance to local agencies; managing water use efficiency financial assistance programs; managing the California Irrigation Management Information System (CIMIS); reviewing,

tracking, and reporting on urban and agricultural water management plans; and water recycling/desalination projects.

## California Irrigation Management Information System

CIMIS is a network of automated weather stations that collects weather data and transmits it to a central repository in Sacramento. After performing quality control and calculations, data are made available to the public for such diverse purposes as irrigation scheduling, resource planning, research, and modeling.

In 2013, DWR's CIMIS network collected data from 147 stations, with approximately 50 percent of the stations on the network belonging to local cooperators. The demand for CIMIS data has been increasing steadily since its establishment in 1982. The number of registered data users has grown from 661 in 1989, to more than 51,000 in 2013.

Approximately 2.5 million reports were generated from the database using the CIMIS website in 2013. Thousands of reports were also retrieved from the CIMIS File Transfer Protocol site and CIMIS web services. Users can register online, access archived data, download data files, and peruse content about the CIMIS program and other helpful metadata and information. A separate but concurrently operating database and web application is maintained for redundancy to protect the data.



CIMIS continued providing the spatially distributed reference evapotranspiration (ET<sub>0</sub>) data, known as Spatial CIMIS, and expanded its user base through outreach activities. Spatial CIMIS is produced by coupling remotely sensed data from the National Oceanic and Atmospheric Administration's Geostationary Operational Environmental Satellite with point measurements from CIMIS stations to estimate ET<sub>0</sub> data at 2-kilometer grids.

In addition to increasing the number of its stations, CIMIS made significant improvements to data quality and availability in support of the Water Conservation Act of 2009 (Senate Bill [SB]X7 7) and the Model Water Efficient Landscape Ordinance. SBX7 7 requires all water suppliers to increase water use efficiency. It also requires, among other things, the development of agricultural water management plans and a 20 percent reduction in urban water consumption by the year 2020.

In 2013, significant progress was made on multiple projects initiated in 2010 to upgrade CIMIS hardware and software to accommodate the anticipated increase in demand for data. The Spatial CIMIS system was moved from the University of California, Davis to DWR, and will be integrated into the newly designed CIMIS website. When completed, these projects are expected to deliver higher-quality CIMIS data more frequently, using user-friendly features.

## Recycling and Water Desalination

The goal of the Division of Statewide Integrated Water Management's Recycling and Water Desalination Section is to improve water use efficiency by promoting increased use of nonconventional water sources—namely recycled water and desalinated brackish and ocean waters—through planning, technical, and financial assistance. As part of a balanced water portfolio, nonconventional water sources will help

meet existing and future water supply and environmental needs. The section's mission consists of increasing safe and beneficial use of recycled water, advancing energy-efficient treatment and desalination technologies, and encouraging economically and environmentally acceptable use of desalinated brackish and ocean waters.

In 2013, the Recycling and Water Desalination Section activities included the following:

- authoring two Resource Management Strategy chapters for the *California Water Plan Update 2013* on Municipal Recycled Water and Desalination (Brackish and Sea Water);
- contributing to various tasks specified in SBX7 7, including assessing how to determine reasonable 2020 and 2030 targets for statewide water recycling; assessing brackish groundwater desalination, infiltration and direct use of urban stormwater runoff; and providing water recycling information for the Commercial, Industrial, and Institutional Task Force on Water Use Best Management Practices;
- providing input to the State Water Resources Control Board's (SWRCB) desalination amendments to the *California Ocean Plan*,
- collaborating with WateReuse Foundation on its National Water Reuse Database,
- continuing to develop new knowledge on water recycling and desalination activities and projects in California;
- instituting desalination technology briefings;
- continuing to manage grant agreements for 17 of the original 48 desalination projects awarded in the first two cycles of the Proposition 50 desalination grant program (the active projects include: 10 research and development projects, 6 demonstration and pilot projects, and 1 construction project);

- continuing Round 3 of Proposition 50 desalination grant solicitation; and
- continuing to provide technical knowledge on water recycling and water desalination issues, including responses to questions from policymakers, regulators, State and local agencies, and the public about permitting issues; public health regulations; types, locations, and amounts of water reuse occurring; and desalinated water production and use.

### Proposition 50 Water Use Efficiency Grant Program

Proposition 50 has provided approximately \$105 million for the Water Use Efficiency Grant Program since 2005. The grant program provided funds for implementation of all urban best management practices and agricultural efficient water management practices that would result in local, regional, and statewide benefits. The State benefits are water conservation, flow and timing, water quality, and energy efficiency, among others.

A competitive proposal solicitation package (PSP) was developed for all grant cycles, along with a comprehensive review and evaluation of the project proposals. The PSP defined project benefits, eligible projects, eligible applicants, funding caps, reporting, and other contract requirements.

In November 2012, DWR received 54 proposals in response to the October 2012 Proposition 50 Agricultural Water Use Efficiency PSP. Approximately \$23.9 million in grant funding was requested for proposed projects totaling more than \$42.5 million. DWR has approximately \$15 million available for this solicitation. The 54 applications received included 14 proposals for implementation projects and 40 applications for nonimplementation projects, of which 21 proposals were for research and development, feasibility studies, pilot projects, and demonstrations; 16 proposals were for training, education, and outreach;

and 3 proposals were Agricultural Water Management Plan (AWMP) preparation.

In 2013, DWR convened independent panels to review and rank the grant applications. The review process resulted in awarding the available \$15 million to support 39 water use efficiency projects statewide. The 39 awarded grants included: 11 implementation projects that result in water savings, increased instream flow, increased water quality, and increased energy efficiency for about \$10 million with a local cost-share of \$13 million; and 28 technical assistance, planning, feasibility study, research and development, training, education, public outreach, and/or pilot projects for about \$5 million with a local cost-share of \$1.5 million.

The total anticipated water savings resulting from the 11 implementation projects funded in 2013 amount to about 19,000 acre-feet (af) per year. The total anticipated water savings resulting from water use efficiency projects funded in previous grant cycles amount to about 190,000 af per year.

In addition to starting the development of grant agreements for the 39 newly awarded grants in 2013, the Water Use Efficiency Grant Program continued managing close to 150 grant agreements from previous proposal solicitations.

### Agricultural Water Management Plans

SBX7 7, the Water Conservation Act of 2009 requires all water suppliers to increase water use efficiency. Agricultural water suppliers are responsible for preparing, implementing, and updating AWMPs, measuring the volume of water delivered to customers, adopting a pricing structure, and implementing efficient water management practices. Agricultural water suppliers who fail to meet the specified water management planning requirements are not eligible for water grants or loans awarded or administered by the State.

SBX7 7 established the Agricultural Water Management Planning Act (California Water Code [CWC] Section 10800, et seq.) requiring an agricultural water supplier to prepare and adopt an AWMP on or before December 31, 2012. The agricultural water supplier is required to update its AWMP on December 31, 2015, and every 5 years thereafter.

“Agricultural water supplier” is defined as a publicly or privately owned water supplier that provides water to 10,000 or more irrigated acres, excluding acreage that receives recycled water. An agricultural water supplier is a supplier of or contractor for water that distributes or sells water for resale. Every water supplier that becomes an agricultural water supplier after December 31, 2012, and provides water to 25,000 or more irrigated acres, excluding recycled water, is responsible for preparing and adopting an AWMP within one year of becoming an agricultural water supplier. Agricultural water suppliers that provide water to less than 25,000 irrigated acres, excluding recycled water, are not required to adopt and implement an AWMP unless sufficient funding has specifically been provided for that purpose.

In October 2012, DWR released the *Agricultural Water Management Plan Guidebook*. The guidebook is meant to help increase agricultural water suppliers’ understanding of the SBX7 7 requirements and assist them in developing their AWMPs. The guidebook also provides information on how agricultural water suppliers may meet the requirements of the agricultural water measurement regulation and associated compliance documentation, as well as the aggregated farm-gate delivery reporting format. The guidebook is available online at DWR’s website.

DWR received 29 AWMPs between December 2012 and September 2013, including 15 SBX7 7 plans, 2 Agricultural

Water Management Council plans, 11 Bureau of Reclamation (Reclamation) Central Valley Project Improvement Act plans, and one Quantification Settlement Agreement (QSA) plan. The 29 submitted plans represented 38 agricultural water suppliers, as one of the plans is a regional plan for 10 water suppliers. All of the agricultural water suppliers that submitted plans have met the general requirements for such plans in the CWC. Plans for 2012 are anticipated to be submitted into 2014, and current numbers are available on DWR’s Water Use Efficiency website.

### ***Agricultural Water Measurement Regulation***

SBX7 7 identified two critical, efficient management practices that agricultural water suppliers are required to implement: measuring the volume of water delivered to customers with sufficient accuracy to comply with CWC Section 531.10(a), and adopting a pricing structure based at least in part on the quantity delivered. It also specified numerous additional efficient management practices for agricultural water suppliers to consider for implementation.

SBX7 7 requires DWR to adopt regulations that specify options for agricultural water suppliers to comply with the water measurement requirement in CWC Section 10608.48(b)(1). The regulations apply to agricultural water suppliers providing water to 25,000 irrigated acres or more. Suppliers providing water to 10,000 or more irrigated acres, but less than 25,000 irrigated acres, are also subject to these regulations, if sufficient funding is provided for that purpose as stated in CWC Section 10853. Agricultural water suppliers that are subject to the regulations must measure the volume of water pursuant to the accuracy standards defined in the regulations and submit that data in the annual report (required by CWC Section 531.10[a]) summarizing aggregated farm-gate delivery data.



As authorized by SBX7 7, DWR adopted an emergency agricultural water measurement regulation through the emergency rulemaking process, that was approved by the Office of Administrative Law and became immediately effective in July 2011. DWR then began the rulemaking process for adopting a permanent agricultural water measurement regulation.

On July 11, 2012, the Office of Administrative Law approved the permanent Agricultural Water Measurement regulation (Title 23, Division 2, Chapter 5.1, Sections 597–597.4 of the California Code of Regulations). The regulation was effective July 11, 2012.

Basically, the regulation allows an agricultural water supplier to choose any applicable single measurement option or combination of options in Section 597.3(a) or (b), and measurement device accuracy and operation has to be certified, tested, inspected and/or analyzed, documented, and reported as described in Section 597.4.

The annual aggregated farm-gate delivery form (required by Assembly Bill 1404 [2007]), CWC Section 531.10) was incorporated into this regulation by reference. All agricultural water suppliers serving more than 2,000 acres of agricultural land or providing 2,000 af of surface water annually for agricultural purposes are required, per AB 1404, to submit to DWR monthly or bimonthly aggregated farm-gate deliveries each year. Large agricultural water suppliers, serving more than 25,000 acres or 10,000–25,000 acres if funding is provided and the acreage is outside the 2003 Colorado River QSA, are also subject to SBX7 7. When measuring farm-gate deliveries, suppliers subject to AB 1404 must measure using best professional practices; whereas suppliers subject to SBX7 7 must use the criteria and accuracy standards in the Agricultural Water Measurement regulation.

AB 1404 broadly defines “best professional practices” to mean practices attaining and maintaining accuracy of measurement and reporting devices and methods (CWC Section 531(d)). In contrast to the preceding AB 1404 general definition, the Agricultural Water Measurement regulation specifies numerical accuracy standards for water measurement devices and requires accuracy certification, reporting, record retention, and specific protocols for device testing and inspection.

## Urban Water Management Plans

California urban water suppliers are required to adopt and submit urban water management plans (UWMPs) to DWR every 5 years.

In 2013, DWR continued the review of UWMPs submitted for the 2010 cycle. During 2013, 102 plans were reviewed.

DWR also collected the information reported in UWMPs into a database and provides reports on urban water use data to the governor, legislators, the media, interested members of the public, and others. In 2013, DWR began posting these reports online.

## 20 Percent Urban Water Use Reduction by 2020

SBX7 7, directs DWR to be the lead agency in implementing a number of separate actions that would guide the State to a targeted reduction of 20 percent of urban water use by 2020.

To implement these actions through a public process, DWR convened and continues to work with an Urban Stakeholder Committee to provide guidance and input.

Many of these actions required the development of methodologies, for use by urban water agencies, to calculate agency level targets and progress toward meeting their water use reduction targets by 2020.

In 2011, DWR published *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*.

The reporting of agencies' targets and their progress in meeting targets is made in the UWMPs and reviewed by DWR. As part of the review of 102 UWMPs in 2013, DWR reviewed the methodologies used for setting urban water use targets for compliance.

Another required action from this legislation directed DWR, in conjunction with the California Urban Water Conservation Council, to convene a task force to develop alternative best management practices for the commercial, industrial, and institutional sector. The task force convened in 2011, and in October 2013, DWR released the draft report *Commercial, Industrial, and Institutional Task Force Water Use Best Management Practices*.

The legislation also requires DWR to report to the Legislature by the end of 2016 and make recommendations on needed changes if the State is not on track to meet per capita targets. Data analysis is ongoing in preparation for this report.

### **Assembly Bill 1420 Compliance**

AB 1420 (Chapter 628, Statutes of 2007) amended the Urban Water Management Planning Act (CWC Section 10610 et seq.) and was effective January 1, 2009. AB 1420 requires that any water management grant or loan made to an urban water supplier and awarded or administered by DWR, the SWRCB, or the California Bay-Delta Authority be conditioned on the implementation of the water demand management measures described in the UWMP, as determined by DWR.

AB 1420 requires DWR to consult with the SWRCB and the California Bay-Delta Authority in the development of eligibility requirements that consider the California

Urban Water Conservation Council's best management practices and alternative approaches that provide equal or greater water savings. In 2009, AB 1420 compliance criteria were released. (The Delta Stewardship Council is the successor to the California Bay-Delta Authority and assumes all of its administrative rights, abilities, obligations, and duties.)

## **Agricultural Drainage Program**

The Agricultural Drainage Program's mission is to seek in-valley solutions to surface and subsurface agricultural drainage water problems, particularly in the San Joaquin Valley, and to improve water quality in the San Joaquin River. This will be accomplished by promoting newer technologies and management practices that can reduce or eliminate off-site discharge of saline water.

This program consists of several activities, including drainage monitoring and evaluation, drainage treatment, integrated on-farm drainage management, drainage reduction and reuse, environmental services, and the San Joaquin River Water Quality Improvement Program.

In 2013, the following activities were conducted:

- monitoring shallow groundwater levels and flows, and collecting water quality data for drainage water from west side San Joaquin Valley tile drain sumps;
- measuring groundwater levels quarterly for approximately 200 wells in Kern County;
- preparing shallow groundwater and irrigation methods maps of drainage-impaired areas for 2011 using drainage monitoring data in conjunction with land use and irrigation methods data;



- collecting flow, electrical conductivity, and temperature data from several satellite-linked and web-accessible stations on the mainstem of the San Joaquin River for the Real-time Water Quality Monitoring Program (RTWQMP);
- producing biweekly forecasts of salinity and flow conditions on the San Joaquin River near Vernalis and other upstream stations using the San Joaquin River Input-Output Day model. Forecasts are published on DWR's website;
- collaborating with the Central Valley Regional Water Quality Control Board and State Water Resources Control Board's initiative, the Central Valley Salinity Alternatives for Long-term Sustainability by providing data, attending committee meetings and reviewing program documents; and
- maintaining a DWR website that includes information on drainage programs and activities, salinity and shallow groundwater maps, grants, and links related to other agricultural drainage programs.

The Agricultural Drainage Program is divided into two major activities: management of Proposition 204 (the Drainage Management Subaccount) and the San Joaquin Valley Agricultural Drainage Program.

### **Proposition 204 (Drainage Management Subaccount)**

In 1996, Proposition 204, The Safe, Clean, Reliable Water Supply Act, authorized the transfer of approximately \$6.1 million from the SWRCB to the California Department of Food and Agriculture. In 1997, the California Department of Food and Agriculture, SWRCB, and DWR signed a memorandum of understanding that established a process for utilizing the funds designated for agricultural drainage water management activities. In 1999, the California Department of Food and Agriculture and DWR signed an interagency agreement to transfer the funds to DWR for developing and

implementing programs consistent with CWC Section 78645, as outlined in the memorandum of understanding. The program's goal is to develop methods of using and concentrating salts and reducing trace element contaminants in the State's subsurface agricultural drainage water.

In 2013, the following final contract reports were submitted:

- *Production and Evaluation of Biofuel From Canola and Mustard Irrigated With Agricultural Water on The Westside of Central California;*
- *Selenium Incorporation in "Jose" Tall Wheatgrass and Bio-availability for Dairy Cattle;* and
- *Evaluation of Chemically-Enhanced Seeded Precipitation of RO Concentrate for High Recovery Desalting of High Salinity Brackish Water.*

These reports are available online at DWR's website.

### **Proposition 204 Bond Funds**

When bond funds are available, DWR solicits proposals from public entities seeking funding for Proposition 204 eligible activities. A technical review committee screens the proposals. DWR submits the proposal packages to an oversight committee comprised of representatives from DWR, the California Department of Food and Agriculture, and the SWRCB for final approval. Ultimately, DWR is responsible for preparing and managing contracts for the approved proposals.

In 2013, DWR initiated the latest round of grant funding under Proposition 204. A draft PSP was developed and posted on the Agricultural Drainage website for review. Two public workshops were held to explain the content of the PSP and to accept comments. The comments were compiled and reviewed, and responses were prepared to clarify the PSP process. A final PSP is being drafted for 2014.

## San Joaquin Valley Agricultural Drainage Program

This program consists of several activities, including drainage monitoring and evaluation, drainage treatment, integrated on-farm drainage management, drainage reduction and reuse, environmental services, and the San Joaquin River Water Quality Improvement Program.

### Drainage Monitoring and Evaluation

Drainage monitoring and evaluation provides information on the quality, quantity, and movement of drainage water. In 2013, the following activities were conducted:

- monitoring shallow groundwater levels and flows, and collecting water quality data for drainage water from west side San Joaquin Valley tile drain sumps;
- measuring groundwater levels quarterly for approximately 200 wells in Kern County;
- preparing shallow groundwater and irrigation methods maps of drainage-impaired areas for 2011 using drainage monitoring data in conjunction with land use and irrigation methods data;
- providing assistance for the collection of groundwater, soil, and operational data for the integrated on-farm drainage management project at Red Rock Ranch (RRR) in western Fresno County; and
- maintaining a website that includes information on drainage programs and activities, salinity and shallow groundwater maps, Proposition 204 grants, and links related to other agricultural drainage programs.

### Drainage Treatment

**Development of Membrane Treatment of Agricultural Drainage Water.** DWR continues to fund research on the use of membrane treatment for desalting agricultural drainage water under a multiyear contract with the University of California, Los Angeles (UCLA).

One reverse osmosis desalination pilot study has been proposed and is currently under construction. The study involves cooperation with UCLA to test a nanofiltration unit coupled with a reverse osmosis unit. This unit will have proprietary sensors that allow the unit to monitor and modify online operating parameters based on changing conditions of the incoming drainage water. This trial will determine the operating efficiency of the unit in terms of the percent of recovery compared to the amount of time it takes for membrane fouling, and it will also determine the electrical and chemical costs of operating the unit.

Construction of this mobile treatment plant is scheduled to be completed in 2014, and initial studies will also be conducted in 2014. The first proposed site is located within the Panoche Drainage District's agricultural drainage water reuse area.

**Grassland Area Farmers—Compliance with Water Quality Control Plan.** DWR continues to participate in a multiagency cooperative effort with Grassland Area Farmers and Reclamation to comply with the objectives of the Central Valley Regional Water Quality Control Board's *Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin*. One of the key components of the plan is drainage water treatment.

The SWRCB approved the environmental impact report/environmental impact statement for the continuation of the *Grassland Bypass Project, 2010–2019*. The proposed actions are to:

- extend the San Luis Drain Use Agreement in order to allow the Grassland Basin Drainers time to acquire funds and develop feasible drain water treatment technology to meet revised Basin Plan objectives and waste discharge requirements by December 31, 2019;

- continue the separation of unusable agricultural drainage water discharged from the Grassland Drainage Area from wetland water supply conveyance channels for the period 2010–2019; and
- facilitate drainage management that maintains the viability of agriculture in the project area and promotes continuous improvement in water quality in the San Joaquin River.

### **Ion Exchange Pretreatment Investigations.**

DWR continues to successfully operate a manually controlled ion-exchange system to “soften” agricultural drainage water, as needed. The small manually operated ion-exchange treatment system provided DWR with enough information to continue utilizing this treatment process on a larger scale. In late 2011, DWR solicited bids for a larger capacity automated ion-exchange system (10 gallons per minute) that would effectively remove hardness from agricultural drainage water. Producing “soft” drainage water reduces the need for cleaning or scale removal in other treatment technologies that DWR will test in the future. The future treatment technologies will consist of electrocoagulation, vapor compression distillation, and reverse osmosis. Another benefit of ion exchange is that the regenerate will be utilized as a dust-control product in the form of calcium chloride and magnesium chloride.

The ion-exchange system was installed in 2012 at the RRR study area. However, due to decreased quantities of agricultural drainage water as a result of drought conditions during 2012 and 2013, the system was not able to operate at capacity. DWR has preliminary plans to install a groundwater well to extract shallow brackish water that will supply adequate quantities of water for softening. The groundwater well will be considered once California Environmental Quality Act (CEQA) clearance has been granted at the RRR study area.

### **Vapor Compression Distillation Investigation.**

A vapor compression distillation unit was installed and operated on a limited basis during 2012. During the treatment process, “softened” drainage water is evaporated, converted to steam, and then condensed, resulting in distilled water and concentrated brine. The unit is expected to achieve a flow rate of 21 gallons per minute, and the expected ratio of distilled water to brine will be 80 percent to 20 percent. In late 2013, DWR entered into an agreement with California State University, Fresno (CSUF) to assist in a study to evaluate the performance of the vapor compression distillation unit located at the RRR study area. When an adequate and consistent source of supply water can be maintained at the project site, DWR will collaborate with CSUF and make necessary repairs and improvements to the treatment unit. The preliminary investigation will determine the amount of energy required to operate the unit under differing flow ratios and total dissolved solids concentrations. The study is expected to be completed in 2014.

**Remote Sensing Hardware.** In March 2012, the remote sensing hardware installed on the wind turbine located at RRR began collecting and storing wind and energy production data for the 10 kilowatt wind turbine. DWR continued collecting and storing data in 2013. DWR plans to analyze the collected data in 2014 to determine the cost effectiveness of wind-generated electrical power on the west side of the San Joaquin Valley to supplement various treatment technologies at the RRR study area.

**Agricultural Subsurface Drainage–Salt Recovery, Purification, and Utilization.** DWR continues to support specific investigations of processes for concentrating and purifying drainage salts for marketing purposes. The current technology that DWR is investigating is an electrochemical process. This process is a carbon dioxide-negative method that produces usable agricultural chemicals



such as acids, bases, and carbonates as by-products. During 2013, a pilot plant was operated at the Tulare Lake Drainage District that showed promising results. Ongoing testing and development continued throughout 2013 and will continue into 2014.

### **Integrated On-Farm Drainage Management**

DWR's South Central Region Office's Integrated On-Farm Drainage Management (IFDM) became a permanent activity when the Integrated Drainage Management Section was created in 2001. Its objective is to provide technical assistance on IFDM systems through advisory, technical, and oversight committees. IFDM is a drainage management system based on sequential reuse of saline drainage water to irrigate crops of progressively increasing salt tolerance. Each sequential reuse reduces the volume of drainage water and increases the salt concentration. Drainage water too saline to irrigate crops is applied to solar evaporators, a management practice that SWRCB supports. The IFDM program funds, administers, and monitors contracts with State, federal, university, and local entities to learn more about IFDM systems. Findings indicate that IFDM systems have less significant environmental impacts than other options, and they reduce the volume of drainage water.

IFDM program staff also:

- coordinate IFDM research activities and data collection with other agencies;
- assist growers and local agencies to plan and develop IFDM systems;
- provide assistance to research projects for the development of crops, including research being performed at RRR by CSUF, to assess the suitability of various salt-tolerant forages and halophytes for, forage quality, productivity, water use, and the sequential reuse of drainage water;

- assist growers, water and drainage districts, and regional entities by providing information on salt-tolerant grasses and IFDM design specifications;
- assist the SWRCB to develop policies for the management of drainage water, salt, and selenium; and
- improve enhanced evaporation features of the pilot solar evaporator.

DWR is continuing research on *Prosopis alba*, an Argentine mesquite tree, in cooperation with the Forestry Research Station at Catholic University of Santiago del Estero in Argentina. *Prosopis alba*, which originated from the plantations of Catholic University of Santiago del Estero, is a highly salt-tolerant tree species that holds promise of ameliorating subsurface drainage problems in the soils of the western San Joaquin Valley. A number of trees were planted at several drainage-impaired locations within the west side of the San Joaquin Valley. DWR has partnered with the Westside Resource Conservation District to monitor the growth and performance of the trees. A group of trees with the best salt and boron tolerance qualities were selected for final testing and were planted at a test site on the west side of the San Joaquin Valley in 2010 for monitoring. This monitoring continued throughout 2012 and 2013. The growth indicates that some varieties of the initial salt-tolerant trees adapt very well to the saline conditions. Research into the feasibility of growing *Prosopis alba* trees in saline soils continued through 2013.

DWR continues to collect operational data from IFDM projects at RRR for performance analysis.

DWR and the Center for Irrigation Technology at CSUF, are worked together with the New Jerusalem Drainage District in western San Joaquin County on a study to develop an operation and management plan to manage water supplies more efficiently and reduce subsurface drainage water.

The main goal is for farmers to use their water supplies efficiently and minimize percolation losses into the local underground shallow water table. A primary goal of the New Jerusalem Drainage District is to eliminate the discharge of subsurface drainage water that collects in the underground water table into the San Joaquin River. A secondary goal is to meet its respective objectives without adversely impacting soil and water quality and crop productivity within the district. The combined goals result in a complex mix of irrigation and drainage management activities that need to be integrated into a single plan. The operation and management plan was completed at the end of 2013 and will be submitted to New Jerusalem Drainage District for review in 2014.

### ***Central Valley Salinity Management Program***

In 2006, the Central Valley Regional Water Quality Control Board and SWRCB initiated a comprehensive effort to address salinity problems in California's Central Valley and adopt long-term solutions that would lead to enhanced water quality and economic sustainability. The Central Valley Salinity Alternatives for Long-term Sustainability is an effort to develop and implement a comprehensive salinity management program. DWR is involved in the process by providing expertise in salinity management through participation in the committees and activities of the Central Valley Salinity Policy Group. This group provides guidance and technical support on specific issues through various committees (the Technical Advisory Committee, Social and Economic Impact Committee, and Public Education and Outreach Committee) and overall direction and management (the Executive Committee) for the development of a comprehensive Central Valley salinity management plan.

### ***Drainage Reduction and Reuse Program***

DWR's Drainage Reduction and Reuse Program offers technical assistance, information, and other resources to growers and irrigators for applying irrigation water efficiently to reduce both excessive deep percolation and drainage water from the immediate on-farm source, while maintaining salt balance in the root zone.

The program objective is achieved through continued on-farm demonstration projects, studies, research, training, and workshops on scheduling irrigation management, advances in irrigation technologies, evaluating irrigation systems, reusing drainage water, and managing salinity.

### ***Environmental Services***

DWR's South Central Region Office's Environmental Compliance Section investigates and reports on IFDM and other systems used for disposal and management of drainage water. Environmental activities include RRR research projects that involve biological monitoring activities required in accordance with waste discharge requirements permits. In 2013, the Environmental Compliance Section began the CEQA process for future studies to be performed at the RRR study area. CEQA compliance is expected to be completed in 2014.

### ***San Joaquin River Water Quality Improvement Program***

DWR's Agricultural Drainage Program, in collaboration with other agencies, continues to make significant efforts to improve water quality in the San Joaquin River to benefit the State and SWP water contractors. These efforts are intended to control salinity and selenium discharges upstream of Vernalis. They include promoting on-farm and regional water management activities to reduce subsurface drainage, real-time water quality management to maximize



the assimilative capacity of the San Joaquin River, and efforts to time wetlands discharges when there is assimilative capacity in the San Joaquin River.

Specific efforts include the West Side Regional Plan, Reclamation's San Luis Drainage Feature Reevaluation to provide drainage service to the San Luis Unit of the Central Valley Project, and the IFDM program maintained by DWR and collaborating agencies.

**On-farm and Regional Drainage Management Activities.** Agricultural Drainage Program staff continued working with the Grassland Area Farmers to help reduce subsurface agricultural drainage water discharges into the San Joaquin River. Drainage management activities involving source control and drainage reuse have proven effective in reducing salt loads in the San Joaquin River. Since the Grassland Area Farmers implemented the Grassland Bypass Project, drainage discharges have decreased from 58,000 af to less than 14,000 af, and salt loads have been reduced from 210,000 tons to about 57,000 tons. The reductions were possible due to the San Joaquin River Improvement Project, an important Grassland Bypass Project component, funded by DWR through Propositions 13 and 50. It consists of 6,000 acres of land dedicated for reuse of subsurface drainage water generated by Grassland Area Farmers to grow salt-tolerant crops. DWR continued to provide technical assistance to improve and develop this part of the Grassland Bypass Project.

**Real-time Water Quality Monitoring Program.** The RTWQMP collects flow, electrical conductivity, and temperature data from several satellite-linked and web-accessible stations on the mainstem of the San Joaquin River and its tributaries. The information provided can be used by San Joaquin River water managers and stakeholders to improve management and coordination of

east side reservoir releases and agricultural and wetland drainage flows to achieve water quality objectives at the San Joaquin River compliance points. In the early stages, RTWQMP was funded by Reclamation and then by CALFED. Currently, DWR has assumed responsibility for funding most of the RTWQMP.

Forecasting flow and salinity conditions on the San Joaquin River allows decision makers to take advantage of the assimilative capacity of the river when available. Data collected from the network of monitoring stations is used with the San Joaquin River Input-Output Day model to generate biweekly forecasts of salinity and flow conditions on the river near Vernalis and other upstream stations. DWR publishes the information weekly on its website.

The RTWQMP has been collaborating with Reclamation, the SWRCB, and the University of California, Merced, to develop and implement a replacement forecasting model. The Watershed Analysis Risk Management Framework model, which was partially funded by Proposition 204, is a more robust model that can provide more accurate modeling of salinity conditions in the San Joaquin River. It is anticipated that the Watershed Analysis Risk Management Framework model will replace the current model in 2014 or 2015.

## Water Conservation Bond Laws

To help local agencies obtain financing for their water management programs, California voters have approved eight bond laws between 1984 and 2006 authorizing DWR to provide grants and low-interest loans to fund project feasibility studies or construction activities. The bond laws are summarized below:

- The Clean Water Bond Law of 1984 (Proposition 25) authorized \$10.5 million for water conservation projects.

- The Water Conservation and Water Quality Bond Law of 1986 (Proposition 44) authorized \$75 million for water conservation and groundwater recharge projects.
- The Water Conservation Bond Law of 1988 (Proposition 82) authorized \$60 million for water conservation, groundwater recharge, and new local water supply improvements.
- The Safe, Clean, Reliable Water Supply Act (Proposition 204), approved in 1996, authorized \$55 million for water conservation, groundwater recharge, and local water supply projects.
- The Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act (Proposition 13), approved in 2000, authorized \$535 million for agricultural and urban water conservation, groundwater recharge, infrastructure rehabilitation, groundwater storage, and interim reliable water supply projects and studies.
- The Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Proposition 50) authorized \$500 million for the IRWM Grant Program to be implemented jointly by DWR and the SWRCB.
- The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84) authorized \$1 billion to continue the IRWM Grant Program. Under this program, grants and construction loans are available with repayment periods of up to 20 years at reduced interest rates for most programs.
- The Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E) authorized \$300 million for IRWM Stormwater Flood Management.

## Propositions 25, 44, 82, and 204

Funding is fully obligated for Propositions 25, 44, 82, and 204.

## Proposition 13

Agricultural water conservation loan funding is still available under Proposition 13.

All loan and grant funds for the Groundwater Recharge, Infrastructure Rehabilitation, Urban Water Conservation, Groundwater Storage, and Interim Reliable Water Supply programs have been obligated.

## Integrated Regional Water Management Grant Program

The IRWM Grant Program is funded by Propositions 50, 84, and 1E.

### Proposition 50

All Proposition 50 funds have been obligated.

### Propositions 84 and 1E

Proposition 84 Local Government Assistance grants provide local public agencies with up to \$250,000 to conduct groundwater studies or carry out groundwater monitoring and management activities. In 2013, \$4.7 million was awarded to 26 water districts and local public agencies.

In 2013, \$91.8 million was awarded in Proposition 1E Round 2 Stormwater Flood Management grants. Awards were made to 10 agencies to help fund \$238 million in projects across the State.





## **Chapter 6**

# **Legislation and Litigation**

*San Luis Reservoir.*

## Significant Events in 2013

Significant legislation related to funding for construction projects related to safe drinking water, State agency contracting, flood protection, and habitat and endangered species protection passed in 2013.

*Information for this chapter was provided by the Legislative Affairs Office and the Office of the Chief Counsel.*



The Department of Water Resources (DWR) monitors State and federal legislation that affects management of the State Water Project (SWP). Legislative bill tracking involves reviewing legislation at its introduction, evaluating amendments in State Assembly and Senate committee hearings, and monitoring its enactment into law. The DWR Assistant Director for Legislation monitors proposed legislation. The Office of the Chief Counsel tracks State and federal litigation that impacts management of the SWP. The DWR Chief Counsel also manages legal cases that involve SWP operations.

## Legislation

### State Legislation

#### ***AB 115 (Perea; Chapter 630, Statutes of 2013)—Safe Drinking Water State Revolving Fund***

Assembly Bill (AB) 115 expands the eligibility for grants from the Safe Drinking Water State Revolving Fund by allowing multiple agencies to collaborate and jointly submit grant applications when at least one of the communities served by the construction project will meet safe drinking water standards.

#### ***AB 118 (Committee on Environmental Safety and Toxic Materials; Chapter 631, Statutes of 2013)—Safe Drinking Water***

AB 118 authorizes a drinking water system serving a severely disadvantaged community to be eligible for a grant, instead of a loan, from the Safe Drinking Water State Revolving Fund. It would also allow the grant to cover the full cost of a project.

#### ***AB 906 (Pan; Chapter 744, Statutes of 2013)—Personal Services Contracts***

This bill restricts State agencies' use of personal services contracts, except when "a clear and imminent danger, requiring immediate action to prevent or mitigate the loss or impairment of life, health, property, or essential public services" is present. It specifically prohibits a State agency from

executing a contract until it has contacted all organizations that represent State employees who perform the type of work to be contracted.

#### ***AB 1259 (Olsen; Chapter 246, Statutes of 2013)—Sacramento-San Joaquin Valley***

AB 1259 clarifies the exceptions to an existing prohibition relating to the approval of development in areas subject to deep flooding—namely, the exception for situations where adequate "urban level" flood protection has been achieved. Existing law currently prohibits local governments from approving development in areas subject to deep flooding unless (1) the area is protected by adequate State and federal levees, (2) the construction of adequate flood protections is underway, or (3) building standards are in place to protect from flooding.

#### ***SB 102 (Budget and Fiscal Review Committee; Chapter 397, Statutes of 2013)—State Employees, Memoranda of Understanding***

Senate Bill (SB) 102 approves side letter agreements recently entered into between the administration and State Bargaining Units 1, 3, 4, 5, 7, 11, 12, 15, 17, 18, 19, and 20. These agreements amend existing memoranda of understanding but do not constitute new agreements. This bill would take effect immediately. DWR's analysis addresses only Section 4 of the bill relating to Bargaining Unit 12, which includes employees of DWR. Among other things, the

provisions of this agreement are intended to help DWR retain highly skilled employees to operate the State Water Project.

### **SB 749 (Wolk; Chapter 387, Statutes of 2013)—Habitat Protection: Endangered Species: Land Management**

SB 749 extends accidental take protection, requires independent scientific review of endangered species status reports, and provides that revenue collected from agricultural leases be used in maintaining and operating the properties that generate it. This bill would also require the water transfer guide that is prepared by DWR to include specific fish and wildlife information.

### **SB 753 (Steinberg; Chapter 639, Statutes of 2013)—Central Valley Flood Protection Board**

This bill clarifies and expands the authority of the Central Valley Flood Protection Board to engage in enforcement actions against persons or public agencies that interfere with, obstruct the performance, maintenance, or operation of, or otherwise adversely affect facilities of, the State Plan of Flood Control, designated floodways, or streams that are regulated by the board.

## **Federal Legislation**

There was no significant federal legislation in 2013 affecting management of the SWP.

## **Litigation**

As of December 31, 2013, DWR was involved in, or closely monitored, a number of court cases and other actions related to the management of the SWP.

### **Sacramento-San Joaquin Delta Delta Smelt**

**Delta Smelt Consolidated Cases (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-407).** *San Luis & Delta-Mendota Water Authority, et al. v. Salazar, et al.* (U.S. Dist. Ct., Eastern

Dist. Cal., No. 1:09-cv-00407); *State Water Contractors v. Salazar, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00480); *Coalition for a Sustainable Delta, et al. v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00422); *Metropolitan Water District of Southern California v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00631); *Stewart and Jasper Orchards, et al. v. United States Fish and Wildlife Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-00892); *Family Farm Alliance v. Kenneth Salazar, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-01201).

Litigation stemming from a coalition of environmental groups' challenge to the 2005 biological opinion (BiOp) on Delta Smelt issued by the U.S. Fish and Wildlife Service (USFWS) continued. USFWS issued the BiOp in 2005, and after judicial review, the 2005 BiOp was found to be unlawful and USFWS was ordered to prepare a new one. On December 15, 2008, USFWS issued a new BiOp. State and federal water contractors, along with DWR, challenged the BiOp in court alleging that the BiOp violated the National Environmental Policy Act (NEPA), the federal Endangered Species Act (ESA), and the Administrative Procedure Act (APA.) After a hearing, the federal district court found USFWS had not complied with the ESA and APA in developing the new BiOp, and once again ordered USFWS to issue a new BiOp in line with the court's ruling. The district court also ruled that the Bureau of Reclamation needed to comply with NEPA prior to implementing the BiOp. (Further details of this litigation are described in earlier bulletins.)

The parties appealed the district court's ruling to the Ninth Circuit Court of Appeals. On September 10, 2012, the United States Court of Appeals for the Ninth Circuit heard oral argument and took the matter under submission. In 2013, the Ninth Circuit did not issue a ruling. However, the Eastern

District Court granted the request of the water and federal fish agencies to extend the deadline in order to implement an adaptive management program.

## Salmon

***The Consolidated Salmon Cases (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053).*** *San Luis & Delta-Mendota Water Authority, et al. v. Gary F. Lock, as Secretary of the United States Department of Commerce, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053); *Stockton East Water District, et al. v. National Oceanic and Atmospheric Administration, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1090); *State Water Contractors v. Gary F. Locke, Secretary, etc., et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1053); *Kern County Water Agency, et al. v. United States Department of Commerce, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1520); *Oakdale Irrigation District, et al. v. United States Department of Commerce, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1580); *The Metropolitan Water District of Southern California v. National Marine Fisheries Service, et al.* (U.S. Dist. Ct., Eastern Dist. Cal., No. 1:09-cv-1625).

Litigation stemming from a challenge to the 2004 BiOp issued by the National Marine Fisheries Service (NOAA Fisheries) continued. In August 2005, a coalition of environmental groups challenged the 2004 BiOp in federal district court. On April 16, 2008, the court held that the 2004 BiOp violated the ESA and APA and ordered NOAA Fisheries to prepare a new BiOp. NOAA Fisheries issued a new BiOp in June 2009. In September 2009, federal and State water contractors challenged the issuance and adoption of the BiOp on the grounds that the federal defendants failed to comply with NEPA, the ESA, and the APA. DWR joined the litigation in January 2010.

On September 20, 2011, the district court issued a memorandum of decision finding in favor of the plaintiffs in part and the defendants in part on the ESA issues. The court instructed NOAA Fisheries to prepare a new BiOp by February 1, 2016. The parties appealed the decision to the Ninth Circuit Court of Appeals and briefs were filed in 2012 and 2013. In 2013, the Ninth Circuit did not issue a ruling. However, the Eastern District Court granted the request of the water and federal fish agencies to extend the deadline for a rewrite of the NOAA Fisheries BiOp by one year in order to implement an adaptive management program.

***California Water Impact Network, California Sportfishing Protection Alliance, and AquAlliance v. California State Water Resources Control Board and California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2010-80000653).*** The conservation groups allege that permit approvals and enforcement failure by the State Water Resources Control Board (SWRCB) has allowed DWR to cause extensive damage to the Bay-Delta Estuary and the fish and wildlife that live there. The administrative record was prepared.

There was no new activity or developments to report for this case in 2013.

## Longfin Smelt

***State Water Contractors v. California Department of Fish and Game, Donald Koch, Director of the California Department of Fish and Game, California Department of Water Resources, Lester Snow, Director of the California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2009-80000203).*** This case, which challenges Incidental Take Permit No. 2081-2009-001-03 issued by the Department of Fish and Wildlife, remains stayed pending completion of the federal litigation challenging the BiOps for Delta Smelt and salmonids. (For details about this litigation, see Bulletin 132-12 and earlier bulletins.)



In 2012, the parties agreed to another stay of the matter. The basis for the continued stay is the upcoming potential federal listing of the Longfin Smelt, potential federal BiOp, and the ongoing Bay Delta Conservation Plan process.

There were no new developments to this case in 2013.

### **Bay Delta Conservation Plan**

***Property Reserve, Inc. v. The Superior Court of San Joaquin County; Department of Water Resources, real party in interest: The Carolyn Nichols Revocable Living Trust v. The Superior Court of San Joaquin County; Department of Water Resources, real party in interest (C067765) Coordinated Proceedings Special Title (Rule 3.550) (C067758, writ denied).***

In earlier lower-court litigation, 24 Delta property owners declined to grant DWR's request to gain temporary entry onto their properties to perform environmental and geological surveys. DWR sought orders for temporary entry onto the respondents' properties under Code of Civil Procedure Section 1245.010 et seq.

The court granted DWR's request for environmental surveys. However, in April 2011, the court denied DWR's request for geotechnical surveys on the grounds that the proposed surveys were a taking and beyond the scope of studies allowed under Code of Civil Procedure Section 1245.010 et seq.

The Delta landowners appealed the environmental order and DWR filed an appeal from the order denying the geotechnical surveys. After the Third District Court of Appeal denied the landowners' appeal, the landowners took their petitions to the Supreme Court. The Supreme Court granted the petitions and directed the Third District Court of Appeal to reconsider the matter. The Third District Court of Appeal then granted the landowners' request for stay and consolidated the appeals.

With consolidation of the matters on appeal, briefing continued throughout 2012. A hearing was set for October 25, 2013, but no ruling was issued by the end of the year.

### **Jones Tract**

***Armando P. Vanni, et al. v. Rindge Land Reclamation District #2039 (Super. Ct. San Joaquin County, No. C072383, app. pending).***

Three consolidated lawsuits alleging damages arising out of the levee breach on Upper Jones Tract in 2004 went to trial from August 22 to December 29, 2011.

In April 2012, the court entered judgment in favor of DWR. The court found that the plaintiffs failed to show a causal connection between the levee failure and State Water Project operations. The plaintiffs appealed, and briefing occurred throughout 2013.

### **State Water Resources Control Board Hearing**

SWRCB Water Right Decision 1641 contains a water quality objective requiring DWR to annually maintain 0.7 millimhos per centimeter electrical conductivity at three compliance points within the South Delta, from April 1 through August 31, beginning in 2005. In response to allegations that the water quality objective was not being met and would not be met, the SWRCB issued a cease and desist order, which was final on May 16, 2006, requiring DWR and Reclamation to take corrective actions to eliminate the threat of noncompliance.

After a period of negotiations, the SWRCB issued a final order in 2010, modifying its 2006 order, which extended the schedule to implement measures to meet the water quality objectives pending completion of the SWRCB's review and potential modification of the salinity objectives. The order also required DWR, along with Reclamation, to undertake studies to assess the feasibility of implementing various measures to meet the salinity objectives.

In 2011, DWR began working with the SWRCB and the Delta Watermaster to facilitate lasting solutions to the issues raised in the order. Studies conducted pursuant to the cease and desist order indicate that the salinity experienced in the southern Delta is attributable, in large part, to local sources and not to DWR or Reclamation activities. Through continued coordination with the Delta Watermaster, additional studies were underway in 2012 to determine the sources of this local salinity and explore options for reducing those sources. There was no new activity on this case in 2013.

## Hydropower

### *Hyatt-Thermalito*

***Alameda County Flood Control & Water Conservation District, Zone 7 et al. v. State of California Department of Water Resources (C065522)***. In 2005, 14 Northern California State Water Contractors sued DWR alleging that the method used by DWR to allocate the costs and revenues of Hyatt-Thermalito power at Oroville violated the long-term water supply contracts. The Metropolitan Water District of Southern California and other southern State Water Contractors intervened in the case as defendants in support of DWR's determination concerning the interpretation of the long-term water supply contract provisions. The trial court found that DWR properly allocated revenue from Hyatt-Thermalito power generation and ruled in favor of DWR.

The plaintiffs filed an appeal on July 8, 2010, and on February 15, 2013, the Court of Appeal issued its decision upholding the trial court's decision. The plaintiffs did not appeal to the California Supreme Court, and the litigation has come to an end.

### ***Oroville Relicensing—Federal Energy Regulatory Commission Project No. 2100***

***Butte County et al. v. Department of Water Resources (C071785, app. pending)***. DWR is seeking renewal of the Federal Energy

Regulatory Commission (FERC) license for its hydroelectric generation facilities at Oroville (Project No. 2100). DWR filed its relicensing application in 2005. The original 50-year FERC license expired on January 31, 2007. In February 2008, FERC authorized continued operation by issuing an annual license—under the same terms and conditions—that renews each year until FERC issues a new license. (Details of the license renewal negotiations and litigation are described in previous bulletins.)

In January 2012, the court denied the petitioner's requests to set aside the EIR prepared by DWR and upheld the award to DWR of \$675,087 in charges for the administrative record required to proceed with the suit. The court found that the EIR was legally adequate and noted that the record preparation complied with the California Environmental Quality Act (CEQA) and was reasonable and necessary. The petitioners, Butte and Plumas counties, appealed the judgment, and the appellate briefs were filed in 2013. No hearing date had been set for oral argument by the end of the year.

## Other Cases

### ***The Monterey Amendment***

***Central Delta Water Agency et al. v. California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2010-80000561) (Central Delta I); Central Delta Water Agency et al. v. Kern County Water Agency et al., DWR et al., real parties in interest (Super. Ct. Kern County, No. S-1500-CV-270965) (Central Delta II); Rosedale-Rio Bravo Water Storage District and Buena Vista Water Storage District v. DWR (Super. Ct. Kern County, No. S-1500-CV-270635-KCT) (Rosedale-Rio Bravo)***. Legal challenges were brought against the 1995 Monterey Amendment and the EIR adopted by DWR in 2010. (The Monterey Amendment, litigation challenging the amendment and the first EIR, the settlement of that litigation, development of the second EIR, and



litigation prior to consolidation of the cases in Sacramento County Superior Court are described in earlier bulletins.)

In April 2012, the court granted DWR's request to try the CEQA claims, time-bar affirmative defense, and reverse validation/mandate claims separately. The trial was set for November 2, 2012.

In December 2012, DWR prevailed on its challenge to the plaintiffs' validation causes of action (including the validity of the Kern Fan Element transfer) on the grounds that they were not timely filed. This leaves only the plaintiffs' CEQA compliance challenge, unless the plaintiffs appeal and are successful in their appeal to reinstate the validation causes of action. The remaining cause of action, a CEQA challenge to the sufficiency of the 2010 EIR, has been set for a hearing on the merits on January 31, 2014. The Central Delta and Rosedale-Rio Bravo cases have been consolidated for the hearing.

### **Water Diversions**

***Cortopassi Partners, a California limited partnership and Reclamation District 2086 v. The State of California (Super. Ct. San Joaquin County, No. CV034843)***. Plaintiffs allege that DWR has created and maintained a nuisance in the Sacramento-San Joaquin Delta by artificially diverting water through the Delta for the SWP.

Although the trial for this case was originally set for early 2012, due to a change in attorneys at the Attorney General's office, the court moved the trial to January 28, 2013. A 27-day trial was held in early 2013. On May 16, 2013, the court found that the plaintiffs had failed to meet their burden of proof and that DWR's operation of the SWP did not violate the North Delta Water Agency contract or cause a private nuisance.

### **Breach of Contract Arbitration**

***State of California acting by and through the Department of Water Resources v. Whitaker Contractors, Inc., a California corporation; Whitaker Contractors, Inc., a California corporation v. State of California acting by and through the Department of Water Resources (OAH No. A-0031-07)***. This breach of contract claim arose out of the Tehachapi East Afterbay completion construction project. The contractor failed to perform work according to contract requirements and was terminated. After lengthy arbitration proceedings, on August 11, 2011, the superior court entered a final judgment upholding the termination of the contractor and awarding DWR \$16.4 million. Whitaker appealed the court's judgment, and as of December 2013, the parties had completed filing their appellate briefs. The court is expected to schedule oral arguments soon. In the meantime, DWR continued its efforts to collect on the judgment.

### **Colorado River**

**Quantification Settlement Agreement Cases ((2011) Cal.App.4th 758)**. These nine claims, which have been coordinated into a single proceeding before the Sacramento County Superior Court, challenge the Quantification Settlement Agreement (QSA) and associated actions taken to implement the QSA—a collection of 38 agreements that resolve disputes among water users in Southern California regarding their rights to California's shrinking share of Colorado River water. (The QSA and earlier litigation activities are described in bulletins from 2007 through 2011.)

In 2012, the respondents 2011 request for Supreme Court Review of this case was denied. On remand from the Court of Appeal, the Sacramento County Superior Court heard oral arguments in November 2012 on how water agencies will share supplies of water from the Colorado River. In June 2013, the Superior Court validated the

QSA agreements related to large transfers of Colorado River water and approved CEQA review.

### ***Area of Origin***

***Solano County Water Agency, Napa County Flood Control and Water Conservation District, City of Yuba City, and County of Butte v. California Department of Water Resources and Does 1–50 (Super. Ct. Sacramento County, No. 34-2008-00016338).*** In July 2008, four SWP water supply contractors—Solano County Water Agency, Napa County Flood Control and Water Conservation District, City of Yuba City, and County of Butte—sued DWR claiming priority to delivery of SWP water and protections from water shortages based on area and watershed of origin statutes, and because they signed SWP water supply contracts. Fourteen SWP contractors located south of the Delta and outside the area of origin have intervened.

The parties negotiated agreements in principle for settlement. On June 17, 2013, the parties filed a stipulation and proposed order of stay until the court approves the settlement agreement.

### ***Perris Dam***

***Metropolitan Water District; Coachella Valley Water District; Desert Water Agency, Real Parties; Albert Thomas Paulek v. California Department of Water Resources (Super. Ct. Riverside County, No. RIC1120142).*** On December 21, 2011, Paulek filed a writ petition challenging DWR’s approval of the Perris Dam remediation program final EIR. The petition raises numerous challenges, including that the EIR does not adequately address and mitigate for impacts on the endangered Stephen’s Kangaroo Rat or on various species covered by a multispecies habitat conservation plan.

On October 1, 2013, the Superior Court denied the writ, holding Paulek had standing to sue under CEQA, but that his substantive arguments lacked merit. The plaintiff has appealed.

## Environmental Review Acts

The National Environmental Policy Act (NEPA) (Title 42 United States Code Sections 4321–4347 [1970]) and the California Environmental Quality Act (CEQA) (California Public Resources Code Sections 21000–21177 [1970]) require government agencies to document and consider environmental consequences of their actions in their decision-making processes. NEPA states that it is the goal of the federal government to use all practicable means consistent with other considerations of national policy to protect and enhance the quality of the environment. All federal agencies must prepare an environmental impact statement (EIS), including a discussion of mitigation measures and alternatives, for federal actions that could significantly affect environmental quality.

CEQA is patterned after NEPA. Under CEQA, State and local agencies are required to (1) disclose, through an environmental impact report (EIR), the significant impacts a proposed project would have on the environment, and (2) identify ways to reduce or avoid environmental damage.

CEQA applies to projects directly undertaken, funded, or approved by State or local agencies. NEPA applies to projects directly undertaken, funded, or approved by federal agencies. The Department of Water Resources (DWR) conducts many projects in cooperation with federal agencies. In these cases, both CEQA and NEPA must be followed.

NEPA requires that mitigation measures and alternatives be disclosed to the public in the EIS, but it does not generally require federal agencies to adopt such mitigation measures or alternatives. CEQA does impose substantive duties on all California government agencies approving projects with significant environmental impacts to adopt alternatives or mitigation measures that they find to be feasible to substantially lessen these impacts, unless there are overriding reasons they cannot. When a project is subject to both CEQA and NEPA, both laws encourage agencies to cooperate in planning the project and preparing joint environmental documents.

The environmental review process allows citizens to learn about a proposed project and its potential significant effects and to participate in the decision-making process by providing feedback on agency information. The review process requires agencies to:

- describe the proposed project and the purpose or need for it;
- identify the lead and cooperating agencies involved in the project;
- invite interested parties to participate in the process;
- determine the scope of study with input from responsible agencies and the public;
- prepare and distribute a draft EIS or EIR;
- respond to comments received on the draft;
- prepare the final EIS or EIR;
- make findings and adopt feasible alternatives or mitigation measures to avoid significant effects, if applicable;

## Environmental Review Acts

- adopt a monitoring plan to ensure compliance with mitigation measures; and
- prepare a list of permits required to implement the project if it is approved.

The scoping phase, which occurs early in the review process, is particularly important because it enables government agencies to identify issues and topics to be considered or addressed in the EIS or EIR.

Information gathered in the scoping phase helps agencies identify and evaluate reasonable alternatives, identify potential environmental impacts of the project, determine data and information needed, develop a work schedule, and allocate resources for preparing and distributing the draft environmental document for public review and comment.

NEPA requires a lead agency to involve the public during scoping, while CEQA does not. CEQA, however, does encourage public involvement, and agencies often opt to conduct activities that provide for wide public involvement. Members of the public may raise issues and identify additional alternatives, environmental effects, methods of assessment, and mitigation measures during the scoping phase and continue to participate in the review process for the draft environmental document. Thus, the CEQA process may lead to changes in a project through the development, consideration, and adoption of alternatives or enforceable mitigation measures to avoid or reduce any potential significant adverse effects on the environment.

If the project is approved, the lead agency publishes a document discussing all the factors considered in reaching its decision to proceed with the proposed action. It also discusses whether all practical means to avoid or minimize environmental harm have been adopted, and if not, the reasons they were not.







## **Chapter 7**

# **Water Supply Development and Reliability**

*Thermalito Diversion Dam and Pool.*

## Significant Events in 2013

In 2013, Yuba County Water Agency (Yuba) delivered 60,000 acre-feet (af) of Component 1 water, 15,000 af of Component 2 water, 37,544 af of Component 3 water, and 64,730 af of Component 4 water for a total of 177,274 af provided to the Department of Water Resources (DWR) and the Bureau of Reclamation (Reclamation) under the 2007 DWR/Yuba Water Purchase Agreement to help augment State Water Project (SWP) and Central Valley Project (CVP) water supply reliability. Half of the water was shared among DWR and some of the SWP contractors, and the other half was shared among Reclamation and some of its CVP contractors.

On September 1, 2013, the Delta Stewardship Council (DSC) issued its legally enforceable *Delta Plan* required under the *Sacramento-San Joaquin Delta Reform Act of 2009* (Delta Reform Act). The *Delta Plan* creates new rules and recommendations to further the State's coequal goals for the Delta: to improve statewide water supply reliability; and to protect, restore, and enhance the Delta ecosystem.

On December 17, 2013, as the State was experiencing one of the driest periods on record, the Governor directed the California Department of Food and Agriculture, the State Water Resources Control Board (SWRCB), DWR, and the Office of Emergency Services to immediately convene an interagency Drought Task Force to meet weekly and review expected allocations, California's state of preparedness, and whether conditions warrant declaration of a statewide drought.

*Information in this chapter was contributed by the State Water Project Analysis Office, the Division of Integrated Regional Water Management, the Division of Statewide Integrated Water Management, and the Bay-Delta Office.*



The Department of Water Resources (DWR) is working to improve the reliability of State Water Project (SWP) supplies and the long-term water contract annual Table A water allocations delivered to SWP water contractors. Staff is engaged in planning activities to develop additional water supplies and storage capacity.

Developing new water supplies and storage projects that are economically, environmentally, and technically sound, while satisfying institutional requirements and political concerns, presents significant challenges. Many concerns center on possible adverse effects that additional storage and delivery facilities may have locally and on the Sacramento-San Joaquin Delta. In the SWP conveyance system, the Delta is the critical link between water supplies in the Sacramento Valley and deliveries to the rest of the Central Valley and Southern California.

DWR works with the State and federal governments, local agencies, and public interest stakeholder groups to ensure water supply reliability now and in the future. To meet SWP water contractors' needs for sufficient water supplies, DWR is engaged in planning, developing, and providing local assistance with the objective of augmenting future SWP water supplies.

## Supply Development and Reliability

Some of the activities DWR is engaged in to augment future SWP supplies include:

- facilitating transfers between SWP long-term contractors and other agencies, including Central Valley Project (CVP) contractors;
- funding studies on the Giant Garter Snake, a protected species known to inhabit rice growing regions of the Sacramento Valley, and rice

evapotranspiration, to better understand issues related to the transfer of water made available by crop idling;

- assisting with developing and implementing local and regional conjunctive use programs in the Sacramento Valley;
- constructing, operating, and maintaining a groundwater monitoring and subsidence monitoring network to detect potential impacts caused by groundwater substitution transfers;
- managing the Feather River watershed above Lake Oroville to reduce sedimentation in the lake and preserve storage capacity; and
- investigating and evaluating storage projects.

## Water Conveyance Through the SWP

DWR encourages and facilitates temporary transfers of water using SWP conveyance facilities for long-term SWP water contractors and other agencies to help meet local, State, and environmental water supply needs. As a practical matter, SWP facilities are often needed to convey transfer water from the existing place of use to the place of use of the transferee. State law requires DWR to make unused SWP capacity available for transfers upon payment of fair compensation, provided that (1) no legal user of water will be injured; (2) there will be no unreasonable effect on fish, wildlife, or other instream beneficial uses; and (3) there will be no unreasonable effect on the overall economy or the environment of the county

from which the water is being transferred (California Water Code [CWC] Section 1810). Water transfers can involve transfers and exchanges among SWP long-term water contractors, between SWP water contractors and non-SWP entities, or between two or more non-SWP entities.

### ***Transfer and Exchange Evaluations***

An important element of any water transfer is determining what quantity of water, if any, is transferable.

The transferability of water depends on many factors including the source of the water being transferred, what is being done to make water available, when the water can be made available, and the type of water right the existing user holds. Several CWC provisions authorize temporary transfers of water rights issued by the State Water Resources Control Board (SWRCB) (appropriative water rights issued after 1914) and put conditions on the transfers to protect those not involved in them.

Short-term transfers, of less than one year, are authorized under Sections 1725–1732. Long-term transfers, for periods greater than one year, are authorized by Sections 1735–1737. Other CWC sections specify conditions under which water can be transferred and legal protections for those transferring water.

Transfers based on water rights obtained before 1914 are not under the jurisdiction of the SWRCB but must comply with the requirements of the California Environmental Quality Act (CEQA) and possibly the National Environmental Policy Act (NEPA).

The CWC sections noted above contain provisions intended to protect other legal users of water and fish and wildlife from the possible adverse effects of a water transfer. These provisions reflect the concept that changes can be made to the authorized place and purpose of use or point of diversion of a water supply as long as there is no injury

to others as a result of the change (the “no injury rule”). The no injury rule in State water law is intended to protect other legal users from the potential expansion of water use beyond what would have been consumed by the original users in the absence of the transfer. Hence, under the no injury rule, only “new water” is transferable (i.e., water added to the downstream water supply only as a result of the transfer). To protect other users, a transfer would not be authorized to the extent that it would reduce the amount or timing of water that would have been available to downstream users, regardless of the water right priority of those users.

CWC Section 1810(d) requires DWR to consider potential impacts of a transfer on legal users, instream uses, and the economy of the area from which the water would be transferred. DWR must determine whether to allow use of any surplus water conveyance capacity for a transfer. DWR reviews each request to transfer water through SWP facilities to assure that only new water will be transferred. This requirement applies to transfers based on both pre-1914 and post-1914 water rights.

Transfer water is most commonly developed through four methods: surplus water released from storage facilities, substitution of groundwater for transferred surface water, idling agricultural land, and undertaking conservation activities that develop new water. Transfers may result in direct impacts and third-party impacts (impact to parties not involved in the transfer). Certain CWC provisions were enacted to limit potential impacts. For example, additional groundwater pumping from a groundwater substitution program can potentially affect other groundwater users in the area. CWC Section 1745.10 generally requires that transfers of surface water in which groundwater will be pumped to make up for the transferred surface water: (1) be consistent with a groundwater management plan adopted pursuant to State law for the

affected area, or (2) not create or contribute to conditions of long-term overdraft in the affected groundwater basin.

Injury can also occur due to stream depletion induced by increased pumping from wells for groundwater-based transfers. The amount of water depleted from the stream must be deducted from the total groundwater pumped for the transfer or the net surface water flows will not increase as assumed. Consequently, to evaluate possible impacts from groundwater substitution transfers, DWR assesses a streamflow depletion factor, which represents an estimate of the effects of the additional groundwater pumping on the surface water system. Each type of transfer has its own set of potential impacts that must be evaluated to protect parties not involved in the transfer.

With the exception of short-term transfers under CWC Section 1725, which provides for an expedited process for water rights issued by the SWRCB, water transfers are subject to compliance with CEQA and, possibly, NEPA. The CEQA/NEPA and SWRCB processes provide opportunities for public review and comment on water transfer proposals.

Staff in the State Water Project Analysis Office, Division of Operations and Maintenance, Division of Integrated Regional Water Management, and the Office of the Chief Counsel evaluate proposed water transfers to determine whether the transfers will impact the SWP, other water users, the environment, or the area from which the water will be transferred.

## SWP Delivery Reliability Report

To assist local agencies with assessing their overall water supplies, DWR provided current data on the SWP's ability to deliver water under 2013 conditions (existing) and for projected conditions in 2033 (future) in a biennial report entitled *The State Water Project Draft Delivery Reliability Report 2013*.

The 2013 report is expected to be finalized in 2014, and the next update of this report is expected in March 2015.

Delivery reliability depends on three factors:

- (1) the availability of water at the source;
- (2) the ability to convey water from the source to the desired point of delivery; and
- (3) the level of demand.

Information in the 2013 report includes both existing conditions and projected conditions, which account for the forecast effects of climate change. In addition, the analysis of the ability to convey water from the source to the point of delivery assumes only SWP facilities, regulations, and permits existing in 2013. In order to provide a conservative estimate of water delivery reliability, no planned facility improvements to the SWP are assumed. Lastly, the level of demand for SWP water assumes the maximum Table A delivery amount is requested and reflects current trends in demand from SWP water contractors.

Detailed information on the assumptions, data, and results of existing and future condition studies for annual Table A water deliveries can be found in the 2013 reliability report available on DWR's website.

## SWP Future Water Supply Program

The Future Water Supply Program provides technical support within DWR for the Lower Yuba River Accord (Yuba Accord) and monitors and assesses conditions of the Sacramento Valley groundwater basin that may affect the yield of the SWP. The Future Water Supply Program's goal is to improve and protect the water supply reliability of the SWP while protecting the environment and other legal users of water. The four primary objectives of the Future Water



Supply Program are to: (1) collect, analyze, and report on data to determine the effects of groundwater substitution transfers on the SWP; (2) analyze and evaluate groundwater substitution transfers using the SWP; (3) monitor groundwater management and planning efforts that may affect the yield of the SWP; and (4) further develop and implement analytical tools to support effective groundwater management in the Sacramento Valley.

The Upper Feather River watershed management component of the program evaluates the Feather River watershed above Lake Oroville with respect to watershed management and restoration actions being planned or implemented. These actions are intended to improve the ecological and hydrologic functions of watersheds, thus affecting base flow, improving flood attenuation, and reducing erosion and sedimentation.

DWR continued collaborative efforts with local stakeholders in 2013 to implement and enhance monitoring activities for assessing the immediate and long-term hydrologic effects of these actions. The Thompson Creek Meadow Water Budget Study was included in these activities.

## Sacramento Valley Water Management Program

The precursor to the current Future Water Supply Program was DWR's work to incorporate conjunctive-use projects in the Sacramento Valley into the SWP to increase SWP dry-year yield. Similar projects were proposed to be implemented by the Sacramento Valley Water Management Agreement, which was signed by stakeholders in early 2003.

For more information on issues surrounding the Sacramento Valley Water Management Agreement, see Bulletins 132-02, 132-03, and 132-04, available on DWR's website.

## SWP Water Rights Activities

### Water Right Permits

SWP operations are governed by the terms and conditions contained in DWR's water right permits and licenses along with other State and federal regulatory restrictions, including biological opinions (BiOps) for the protection of endangered species. DWR holds water right permits authorizing SWP operations at each of the SWP facilities, including the Oroville and Delta facilities (which include the North Bay Aqueduct), for water supply purposes. Each permit specifies the authorized quantities of direct diversion and diversion to storage, place of use, purpose of use, and time within which the permitted quantities must be put to beneficial use. A change in any of the terms and conditions contained in the water right permits and licenses, including a change in the place or purpose of use or point of diversion, requires SWRCB approval.

Diversion and use of SWP water throughout the SWP service area has increased since initial operations in the 1960s. However, due to a number of factors, including operational and regulatory constraints, the beneficial use of water has not yet reached the maximum quantities anticipated for full development of the SWP.

Pursuant to CWC Section 1725, on July 1, 2013, the SWRCB approved a temporary change in the authorized place of use of (1) the Bureau of Reclamation (Reclamation) license and permits to include the SWP authorized place of use downstream of Banks Pumping Plant; and (2) the DWR permit to include the CVP authorized place of use downstream of Jones Pumping Plant to facilitate several exchanges between SWP and CVP contractors. The SWRCB order approved a maximum total exchange amount of 196,000 acre-feet (af) from July 1, 2013, through June 30, 2014, for six exchanges including (1) Santa Clara Valley Water District; (2) Oak Flat Water District/

Del Puerto Water District; (3) Kern County Water Agency/Kern-Tulare Water District; (4) Castaic Lake Water Agency/San Luis Water District; (5) Arvin-Edison Water Storage District/The Metropolitan Water District of Southern California; and (6) Kern County Water Agency/Westlands Water District. A total of 23,993 af were exchanged under the order in 2013. Additional water may be exchanged under the order in 2014.

### **Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary**

The Delta and Suisun Marsh are located where California's two major river systems, the Sacramento and the San Joaquin, converge and flow westward to meet incoming seawater tides flowing through the San Francisco Bay. The watershed of the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Estuary) is a critical source of water supply for much of California. The watershed is a source of drinking water for two-thirds of the State's population; it supplies some of the State's most productive agricultural areas; and it provides water for fish, wildlife, and other public trust uses of water within and upstream of the estuary.

Water originating in the Bay-Delta watershed is delivered to areas within the watershed and to areas south and west of the estuary. The largest water distribution systems that release stored water into the Delta and directly divert water from the Delta are the SWP, operated by DWR, and the federal CVP, operated by Reclamation. Numerous other water storage and diversion projects influence Bay-Delta Estuary inflows, outflows, water quality, and other hydrologic characteristics.

The SWRCB regulates both the quality of water in the Bay-Delta Estuary and the diversion and use of water released into and diverted from the estuary for water supply.

The SWRCB coordinates its regulatory authorities under State laws governing water quality and water rights, ensuring that water quality is protected for all beneficial uses when water is diverted from the estuary.

In 1999, the SWRCB adopted Water Right Decision 1641 (later modified by Order WR 2000-02) modifying the terms and conditions of a number of water right permits and licenses, primarily those for the SWP and CVP, to implement the objectives of the 1995 water quality control plan.

Under its authority to protect beneficial uses of water, the SWRCB adopted the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) on December 13, 2006 (Resolution No. 2006-0098). The Bay-Delta Plan contains objectives for flow, salinity, dissolved oxygen levels, and other parameters necessary for protection of various beneficial uses such as municipal and industrial, agricultural, and fish and wildlife. The SWRCB implements these objectives in part or in whole, depending on the circumstances, through conditions on water right permits and licenses.

### **SWRCB Bay-Delta Proceedings—2013 Activities**

In 2013, SWRCB proceedings examined a number of issues in the Bay-Delta Estuary relating to water quality, protection of beneficial uses for agriculture and fish and wildlife, and salinity issues, among others, which have the potential to affect Delta water supply and reliability.

### **2006 Bay-Delta Plan Review**

Water Code Section 13240 requires that the water quality control plan be periodically reviewed. Federal Clean Water Act Section 303(c) (33 U.S.C. Section 1313(c)) requires a triennial review of State water quality "standards," as defined in the act.

A workshop on October 8, 2008, formally began a review of the 2006 Bay-Delta Plan.

The review and amendment process for the 2006 Bay-Delta Plan consists of:

- identifying elements that may need amendment or new elements that may need to be added;
- preparing any amendments or revisions to the entire water quality control plan; and
- SWRCB's adoption of some or all of the amendments or revisions.

SWRCB information-gathering activities may affect the scope of the Bay-Delta Plan review and may include evidentiary hearings on critical issues concerning the Delta's ecology. The Bay Delta Conservation Plan environmental review may provide some of the analyses needed for the comprehensive Bay-Delta Plan review.

In 2013, SWRCB continued its review and update of the 2006 Bay-Delta Plan. The work consists of a four-phased process to develop and implement updates to the Bay-Delta Plan and flow objectives for priority tributaries to the Delta to protect beneficial uses in the Bay-Delta watershed. Phase 1 includes review and potential modification of the San Joaquin River flow objectives for the protection of fish and wildlife beneficial uses, the southern Delta water quality objectives for the protection of agricultural beneficial uses, and the program of implementation for those objectives. Phase 2 involves other comprehensive changes to the Bay-Delta Plan to protect beneficial uses not addressed in Phase 1. Phase 3 involves changes to water rights and other measures to implement changes to the Bay-Delta Plan from Phases 1 and 2. Phase 4 involves developing and implementing flow objectives for priority Delta tributaries outside of the Bay-Delta Plan updates.

Phase 2 was initiated with three public workshops in 2012. The workshops gathered information and discussed the scientific and technical basis for considering potential changes to the 2006 Bay-Delta Plan. Topics included ecosystem changes and the low-salinity zone; Bay-Delta fishery resources (focusing on pelagic fishes and salmonids); and analytical tools for evaluating the water supply, hydrodynamic, and hydropower effects of the Bay-Delta Plan.

In June 2013, SWRCB received the *Comprehensive (Phase 2) Review and Update to the Bay-Delta Plan: Final Bay-Delta Plan Workshops Summary Report*, which discusses these topics.

For more information about water quality objectives and compliance monitoring in the South Delta, see Chapter 4, Water Quality Programs.

## Delta Stewardship Council Activities

On September 1, 2013, the Delta Stewardship Council issued its legally enforceable *Delta Plan* required under the *Sacramento-San Joaquin Delta Reform Act of 2009* (Delta Reform Act). The *Delta Plan* creates new rules and recommendations to expand the State's coequal goals for the Delta: to improve statewide water supply reliability; and to protect, restore, and enhance the Delta ecosystem, all in a manner that preserves, protects, and improves the unique agricultural, cultural, and recreational characteristics of the Delta.

The *Delta Plan* is founded on cooperation and coordination among affected agencies and is enforceable through regulatory authority that requires State and local agencies to be consistent with the *Delta Plan*.



## Storage Program

DWR is the State lead agency for the Storage Program, which consists of surface storage studies and groundwater programs and projects. The Storage Program began under the CALFED Bay-Delta Program. (For background on the CALFED Bay-Delta Program, see Bulletins 132-95 through 132-11.)

The Storage Program is a comprehensive program with potential benefit for the SWP consisting of actions related to surface and groundwater storage. DWR's Division of Statewide Integrated Water Management and Division of Integrated Regional Water Management have been working with State and federal agencies to enhance storage and conjunctive-use programs that support local project development via loans and grants. The Storage Program is part of an ongoing evaluation of how storage, both groundwater conjunctive use and surface storage, can help meet California's urban, agricultural, and environmental water supply reliability, ecosystem restoration, and water quality needs.

## Surface Storage Investigations

Surface storage investigations are developing environmental documentation and feasibility studies for four of the five surface storage projects identified for further study in the CALFED record of decision.

### *Los Vaqueros Reservoir Expansion Project*

Contra Costa Water District owns and operates the 100,000 af Los Vaqueros Reservoir just southwest of the Sacramento-San Joaquin Delta. The Los Vaqueros Reservoir Expansion Project involves analysis of increasing reservoir storage by as much as 175,000 af, for a potential storage capacity of up to 275,000 af.

The project objectives are: (1) to develop water supplies for environmental water

management; (2) to increase water supply reliability within the San Francisco Bay Area; and (3) to the extent possible, improve the quality of water deliveries to municipal and industrial customers without impairing the project's ability to meet the first two objectives.

The Contra Costa Water District Board certified a final environmental impact report and approved an expansion from 100,000 af to 160,000 af on March 31, 2010. The expansion was completed and dedicated July 13, 2012.

With additional funding, local, State, and federal partners may choose to continue to study the feasibility of a 275,000 af expansion alternative in the context of other Delta initiatives to improve Delta conveyance and better protect Delta fisheries, including long-term programs being explored in the Bay Delta Conservation Plan.

### *Shasta Lake Water Resources Investigation*

Reclamation, in coordination with other agencies, is studying the feasibility of expanding Shasta Dam and Lake, primarily to promote increased survival of anadromous fish populations in the upper Sacramento River and to increase water supply reliability. An enlargement of Shasta Dam would inundate additional lands around the existing reservoir and affect a portion of the McCloud River. California Public Resources Code Section 5093.542(c), the Wild and Scenic Rivers Act, states that, "except for participation by the Department of Water Resources in studies involving the technical and economic feasibility of enlargement of Shasta Dam, no department or agency of the state shall assist or cooperate with, whether by loan, grant, license, or otherwise, any agency of the federal, state, or local government in the planning or construction of any dam, reservoir, diversion, or other water

impoundment facility that could have an adverse effect on the free-flowing condition of the McCloud River, or on its wild trout fishery.”

The State budget does not include funding for DWR to continue participating in this study. However, Reclamation’s planning is ongoing. In June 2013, Reclamation released a draft environmental impact statement.

### **North-of-the-Delta Offstream Storage Investigation**

DWR and Reclamation are working in partnership with local, State, and federal agencies to further study north-of-the-Delta offstream storage opportunities. The North-of-the-Delta Offstream Storage Investigation focuses on potential projects on the west side of the Sacramento Valley, including Sites Reservoir.

Storing water in offstream reservoirs during excess flow periods could provide opportunities to increase water storage in an environmentally sensitive manner. The stored water can then be made available to enhance water management flexibility in the Sacramento Valley and the Bay-Delta Estuary, reducing water diversions on the Sacramento River during critical fish migration periods, increasing the reliability of supplies for the Sacramento Valley and statewide, and providing storage and operational flexibility to support environmental enhancement actions and adapt to climate change.

North-of-the-Delta Offstream Storage Investigation studies were ongoing in 2013.

### **Upper San Joaquin River Basin Storage Investigation**

DWR and Reclamation, in coordination with other State and federal agencies, are evaluating opportunities for increased storage in the upper San Joaquin River watershed. The objectives of the Upper San

Joaquin River Basin Storage Investigation are to: (1) increase water supply reliability and operational flexibility in the CVP’s Friant Division, other San Joaquin Valley areas, and other regions, and (2) enhance water temperature and flow conditions in the San Joaquin River in support of San Joaquin River restoration efforts. Other opportunities include additional hydropower generation, reduction of flood damages, water quality improvements, and recreation site development.

In May 2009, Reclamation and DWR released a plan formulation report for the Upper San Joaquin River Basin Storage Investigation that described the alternative formulation, evaluation, and comparison activities that led to selection of Temperance Flat RM 274 Reservoir for detailed feasibility-level evaluation. The report described the progress of the study to date and included additional information on the economics, operations, and costs of Upper San Joaquin River Basin Storage Investigation alternatives. It also defined a set of alternative plans to be considered in the study’s feasibility report and environmental impact statement/ environmental impact report.

The study continued in 2013 with draft and final feasibility studies and environmental documents scheduled for 2014 and 2015.

## **Delta Conveyance Program**

The Conveyance Program previously consisted of projects proposed in the North and South Delta. As a result of the efforts associated with Bay Delta Conservation Plan and the Delta Stewardship Council’s *Delta Plan*, many of these efforts were suspended as staff was redirected to work on the SWP Delta Compliance Program. The remaining projects are discussed briefly below; more detailed information about the Delta can be found in Chapter 2, Delta Resources.



## SWP Delta Compliance Program

The SWP obtained take authorization for federal and California Endangered Species Act listed species through the December 2008 U.S. Fish and Wildlife Service BiOp for Delta Smelt; the February 2009 Department of Fish and Wildlife incidental take permit (ITP) for Longfin Smelt; and the June 2009 National Marine Fisheries Service (NOAA Fisheries) BiOp for salmon, steelhead, and Green Sturgeon. Many of the regulatory requirements will require studies and projects, which are currently underway.

### *Ad Hoc Studies*

In January 2012, a joint stipulation was filed in the consolidated salmonid cases litigation regarding the 2009 NOAA Fisheries BiOp. The 2012 Stipulation Study was undertaken to gain more information about the effects of SWP and CVP export operations on juvenile steelhead and fall-run Chinook salmon; gain a better understanding of Old River and Middle River reverse flows on steelhead route selection and survival in the South Delta; and pilot an approach to manage water export risks to Endangered Species Act listed salmonids. The study was successfully planned and completed and was the first of its kind to utilize real-time data to inform in-season management and water operations.

During 2013, a data analysis plan was prepared and approved by an interagency technical team. The analysis was completed and a draft technical report was prepared for review.

## North Delta

With the North Delta Flood Control and Ecosystem Restoration Project, solutions to improve flood management and the ecosystem are being considered, including setback levees, detention basins, dredging, and levee degradation for floodplain expansion. For more information about this project, see Chapter 2, Delta Resources.

## South Delta

Actions in the South Delta include the South Delta Improvements Program (SDIP), implementing flood control and ecosystem improvements in the lower San Joaquin River, completion of an intertie between the SWP California Aqueduct and CVP's Delta-Mendota Canal, and continuation of DWR's Temporary Barriers Program.

SDIP is a two-stage project. Stage 1 proposes to reduce the movement of San Joaquin River watershed Central Valley fall-run and late fall-run juvenile Chinook Salmon into the South Delta via Old River and to maintain adequate water levels and water quality for agricultural diversions in the South Delta. Stage 2 would increase water deliveries and delivery reliability to SWP and CVP contractors south of the Delta and increase the maximum permitted level of diversion through the existing intake gates at Clifton Court Forebay.

The SDIP final environmental impact report/environmental impact statement (2006) evaluated alternatives and proposed proceeding with SDIP Stage 1. This component involves constructing permanent operable gates and channel dredging in the South Delta. DWR is proposing installation of these permanent gates to replace temporary rock barriers currently installed and removed each year under DWR's Temporary Barriers Program.

Reclamation and DWR's 2008 biological assessment for the SWP and CVP Long-term Operations Criteria and Plan included operation of the SDIP permanent operable gates.

The U.S. Fish and Wildlife Service BiOp, issued in December 2008, concluded that coordinated operations of the CVP and SWP would jeopardize Delta Smelt. The U.S. Fish and Wildlife Service provided a reasonable and prudent alternative under which SDIP could move forward.

The NOAA Fisheries BiOp, issued in June 2009, concluded that CVP and SWP operations would jeopardize a number of anadromous species, in particular Chinook Salmon. NOAA Fisheries provided no reasonable and prudent alternative for SDIP. DWR initiated discussion with NOAA Fisheries in late 2009 to establish what actions could lead to a reasonable and prudent alternative under which SDIP could move forward; however, NOAA Fisheries stated an interest in holding off on further discussion until completion of an on-going multiyear South Delta Temporary Barriers Program predation study. The study field data collection has been completed, and data analysis is in progress. Data from the study will be useful in considering permanent barrier design options and operation strategies to minimize predation.

Any action regarding SDIP Stage 2 will require further study and public input. Stage 2 planning continued to be suspended in 2013.

For additional information about the Temporary Barriers Program, see Chapter 2, Delta Resources.

## Lower Yuba River Accord

The Yuba Accord's purpose is to resolve instream flow issues and protect and enhance lower Yuba River fisheries and local water supply reliability. The Yuba Accord provides revenues for local flood control and water supply projects; water to enhance SWP and CVP water supply reliability by offsetting Delta export reductions for protection and restoration of Delta fisheries; and improvements in statewide water supply management, including dry year supplies for participating SWP and CVP contractors.

The Yuba Accord is based on three agreements, as follows:

- a water purchase agreement with DWR;
- conjunctive use agreements with Yuba County Water Agency (Yuba) member units; and
- a fisheries agreement.

Three amendments were executed in 2009 and 2010 to address a technical refill issue and groundwater substitution pricing issues.

Amendment No. 4 was executed in 2012 between DWR and Yuba, and between DWR and 22 participating contractors, to streamline the process for addressing groundwater substitution pricing issues from 2012 through 2015. The parties pursued the negotiation process provided in Amendment No. 4, but did not agree on the price for groundwater substitution transfers in 2012.

The water purchase agreement transfers water to help offset Delta export reductions annually and provides dry-year transfer water for SWP and CVP contractors from surface and groundwater substitution sources.

In 2013, Yuba transferred a total of 177,274 af to DWR under the 2007 DWR-Yuba Water Purchase Agreement. A total of 60,000 af of Component 1 water was shared equally between DWR and Reclamation to help offset Delta export reductions to benefit fish. The Component 2, 3, and 4 dry-year water deliveries were 15,000 af, 37,544 af, and 64,730 af, respectively, and were shared equally among some of the SWP contractors and some of the CVP contractors.

The 2013 deliveries were comprised of 112,544 af of storage releases (surface flows) and 64,730 af of groundwater substitution water provided in 2012. An additional 17,518 af of Yuba releases was backed into

Lake Oroville during balanced conditions from October 1 through November 16, 2013, and is being held for release in 2014, provided it can be exported. From October 17 through December 31, 2013, Yuba released an additional 12,071 af of surface water that could not be backed into Lake Oroville because releases to the Yuba River were at minimum allowable flows during that period; those releases were therefore lost as transfer water.

For additional details about the Yuba Accord, see Chapter 9, Water Contracts and Deliveries.





## Chapter 8 Water Supply

*Snow gauges in Alpine County.*



## Significant Events in 2013

**W**ater year 2012–2013 proved to be a dry year, with less than average precipitation and mountain snowpack. The State received precipitation at 79 percent of average in water year 2012–2013 compared to 77 percent of average in water year 2011–2012. Though a below-average water year, the Northern Sierra 8-Station Precipitation Index (8SI) had the ninth wettest December and fourth driest February on record. More than 66 percent of the water year precipitation in the 8SI fell during November and December 2012. The statewide mountain snowpack peaked at 60 percent of its April 1 average in mid-March.

Statewide river runoff totaled 60 percent of average in the 2012–2013 water year. The Feather River runoff totaled 69 percent of average. Water year runoff totals for the Sacramento River Region (SRR), San Joaquin 4 Rivers (SJR), and Tulare Lake Region (TLR) were well below average at 67, 51, and 36 percent of average, respectively.

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were “dry” and “critical,” respectively, based on observed data for water year 2012–2013.

*Information in this chapter was contributed by the Division of Flood Management and the Division of Operations and Maintenance.*

The Department of Water Resources (DWR) monitors precipitation, estimates mountain snowpack, calculates river runoff, and operates storage facilities during each water year. The official California water year runs from October 1 through September 30. DWR continually updates hydrologic data and information. If your research requires more current data than was available at the time of publication, please consult the most recent edition of Bulletin 120, Bulletin 132, and/or contact DWR staff in the Hydrology and Flood Operations Office.

## California's Hydrology

DWR divides California into 10 hydrologic regions (see Figure 8-1). Each hydrologic region corresponds to the State's major water drainage basins. Annual precipitation, mountain snowpack, and runoff data is collected and analyzed for the hydrologic regions and used to determine water year type classifications and forecasts for the State's water supply outlook.

The State's precipitation is measured using two primary indices, the Northern Sierra 8-Station Precipitation Index (8SI) and the San Joaquin 5-Station Index. For more information, see the sidebar, Precipitation and Runoff Estimates.

Runoff estimates are determined for the Sacramento River Region (SRR), the San Joaquin 4 Rivers (SJR), and the Tulare Lake Region (TLR). For more information, see the sidebar, Precipitation and Runoff Estimates.

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index), are used to derive the water year classification for the Sacramento Valley and the San Joaquin Valley, respectively, and are used by various water agencies to formulate water supply decisions. For more information, see the sidebar, Water Supply Indices.

## Water Year 2012–2013

### Precipitation

California experienced below-average rainfall and mountain snowpack during water year 2012–2013. The State received precipitation at 79 percent of average in 2012–2013, compared to 77 percent of average in water year 2011–2012. Figure 8-1 presents water year precipitation for the various regions of the State. The 8SI finished the water year with 46.2 inches of precipitation, which was 92 percent of average. The statewide average snow water equivalent, based on snow sensors, reported for April 1, was 13.2 inches, or 47 percent of average. Historically, April 1 is the average annual date of peak snow accumulation. This water year, the statewide mountain snowpack peaked in mid-March at 17.1 inches.

Table 8-1 presents monthly precipitation totals for water year 2012–2013 at various gauges located throughout the State, listed north to south. Statewide, the wettest months were November and December. In contrast, January and February were dry. The greatest portion of precipitation for the north fell on two different 7-day periods with the first ending on December 5, 2012, and the second on December 27, 2012.

Eureka Woodley Island on the north coast of California received 34.8 inches of precipitation for a water year total that was 91 percent of average. Precipitation





Figure 8-1 Statewide Precipitation by Hydrologic Region, 2012–2013 Water Year, as Percent of Average

**Table 8-1 Water Year<sup>a</sup> Monthly Precipitation Totals at Various Locations in California, 2012–2013**

Station <sup>b</sup>	Monthly Precipitation (inches)															
	Water Year 2012–2013												Water Year 2013–2014			
	2012			2013									WY			
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Oct	Nov	Dec
Mount Shasta City	1.18	10.71	10.82	0.98	1.55	3.46	0.94	1.06	0.81	0.11	0.02	1.80	<b>33.44</b>	0.79	0.37	0.49
percent of average	50	233	184	15	28	79	33	62	76	44	6	288	<b>93</b>	34	8	8
Eureka Woodley Island	2.72	6.36	10.97	2.57	1.78	3.09	2.44	1.17	0.43	0.00	0.08	3.14	<b>34.75</b>	0.05	1.29	0.56
percent of average	91	115	171	40	34	59	85	65	70	0	33	413	<b>91</b>	2	23	9
Blue Canyon (DWR-2)	5.08	17.76	19.46	1.88	1.15	5.94	1.71	2.03	3.54	0.00	0.04	0.00	<b>58.59</b>	1.18	2.36	2.07
percent of average	135	225	186	15	12	70	34	75	402	0	11	0	<b>93</b>	31	30	20
Sacramento WB City	1.28	3.97	6.15	1.06	0.36	1.59	0.58	0.30	0.22	0.00	0.00	0.55	<b>16.06</b>	0.00	0.82	0.38
percent of average	139	196	193	28	11	67	39	65	169	0	0	262	<b>90</b>	0	40	12
San Francisco WB AP	1.47	4.50	7.11	0.49	0.85	0.97	1.01	0.04	0.15	0.00	0.04	0.39	<b>17.02</b>	0.00	0.91	0.35
percent of average	139	190	191	11	26	35	71	9	100	0	67	205	<b>86</b>	0	38	9
Yosemite Headquarters	1.15	4.90	10.49	1.10	0.37	3.18	1.58	1.07	0.12	0.00	0.00	0.87	<b>24.83</b>	0.65	0.73	1.53
percent of average	67	116	159	16	6	64	49	76	21	0	0	140	<b>68</b>	38	17	23
Fresno WB AP	0.25	1.11	2.03	0.58	0.89	0.65	0.09	0.07	0.00	0.00	0.00	0.01	<b>5.68</b>	0.03	0.54	0.15
percent of average	52	100	115	29	43	35	8	25	0	0	0	7	<b>52</b>	6	49	9
Grant Grove	1.23	3.97	12.52	2.43	1.21	1.72	0.89	0.46	0.00	0.32	0.21	0.21	<b>25.17</b>	1.82	0.29	0.92
percent of average	63	77	160	32	17	23	21	39	0	533	300	39	<b>58</b>	93	6	12
Los Angeles WSO AP	0.15	1.31	2.82	1.30	0.20	0.66	0.06	0.39	0.00	0.03	0.00	0.00	<b>6.92</b>	0.02	0.69	0.30
percent of average	39	93	134	48	7	35	7	279	0	300	0	0	<b>54</b>	5	49	14
San Diego NWS Lindbergh Field	0.70	0.28	2.19	1.21	0.63	1.22	0.01	0.26	0.00	0.05	0.00	0.00	<b>6.55</b>	0.25	1.48	0.46
percent of average	167	25	115	59	33	76	1	124	0	250	0	0	<b>63</b>	60	131	24

<sup>a</sup> Water Year = October 1–September 30

<sup>b</sup> AP = Airport; NWS = National Weather Service; WB = Weather Bureau; WSO = Weather Service Office

for the station was above normal for 3 months of the 2012–2013 water year. December accumulated the largest quantity of precipitation for the water year, with 11.0 inches (171 percent of average).

Blue Canyon experienced above-normal precipitation for 4 months of water year 2012–2013. The station totals for the water year were 58.6 inches and 93 percent of average. The month of December accumulated the largest precipitation and percent of normal for the water year—19.5 inches, which was 186 percent of average.

Areas of the Central Valley received above-normal precipitation for the months of

November and December. Precipitation totals during those months for Sacramento were 4.0 and 6.2 inches (196 and 193 percent of average) and for Fresno 1.1 and 2.0 inches (100 and 115 percent of average). For the water year, Sacramento received 90 percent of its annual precipitation average while Fresno received only 52 percent of its annual average, emphasizing the precipitation gradient from north to south.

In the San Joaquin and Tulare Lake watersheds, water year total precipitation was well below average. The largest amounts of precipitation fell in these watersheds during the months of November and December, which is similar to what transpired in Northern California. More than

## Precipitation and Runoff Estimates

### Precipitation

Northern Sierra 8-Station Precipitation Index (8SI)

In the northern Sierra Nevada, precipitation is indexed by averaging rain gauge totals at eight representative stations, creating what is known as the Northern Sierra 8-Station Precipitation Index. The index provides a representative sample of the major watersheds (upper Sacramento, Feather, Yuba, and American rivers) and serves as a wetness index for the Sacramento River hydrologic region.

The rain gauge stations are:

- |                       |                                |
|-----------------------|--------------------------------|
| (1) Mount Shasta City | (5) Brush Creek                |
| (2) Shasta Dam        | (6) Sierraville Ranger Station |
| (3) Mineral           | (7) Blue Canyon                |
| (4) Quincy            | (8) Pacific House              |

San Joaquin 5-Station Precipitation Index (5SI)

In the central Sierra Nevada, precipitation is indexed by averaging rain gauge totals at five representative stations, creating what is known as the San Joaquin 5-Station Precipitation Index. The index provides a representative sample of the major watersheds (Stanislaus, Tuolumne, Merced, and San Joaquin rivers) and serves as a wetness index for the San Joaquin River hydrologic region.

The rain gauge stations are:

- |                            |                               |                     |
|----------------------------|-------------------------------|---------------------|
| (1) Calaveras Big Trees    | (3) Yosemite Headquarters     | (5) Huntington Lake |
| (2) Hetch Hetchy Reservoir | (4) North Fork Ranger Station |                     |

### Runoff

Unimpaired runoff represents the natural water production in a river basin, unaltered by upstream diversions, storage, or export of water to or import of water from other basins.

Sacramento River Region (SRR)

SRR is the sum of unimpaired flow in million acre-feet (maf) at designated gauging stations:

- (1) Sacramento River above Bend Bridge
- (2) Feather River at Oroville (inflow to Lake Oroville)
- (3) Yuba River near Smartville
- (4) American River below Folsom Lake

San Joaquin 4 Rivers (SJR)

SJR is the sum of unimpaired flow in maf at designated gauging stations:

- (1) Stanislaus River below Goodwin Dam (inflow to New Melones Reservoir)
- (2) Tuolumne River below La Grange (inflow to New Don Pedro Reservoir)
- (3) Merced River below Merced Falls (inflow to Lake McClure)
- (4) San Joaquin River inflow to Millerton Lake

Tulare Lake Region (TLR)

TLR is the sum of unimpaired flow in maf at designated gauging stations:

- (1) Kings River below Pine Flat Reservoir
- (2) Kaweah River below Terminus Reservoir
- (3) Tule River below Lake Success
- (4) Kern River below Lake Isabella



## Water Supply Indices

### Sacramento Valley 40-30-30 Index

State Water Resources Control Board (SWRCB), Water Right Decision 1641 (D-1641) defines the Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index), a water supply forecasting tool used to derive the water year type for the Sacramento Valley. SWRCB first introduced the Sacramento Valley 40-30-30 Index in the 1991 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan), and continued using it with the 1995 Bay-Delta Plan. D-1641 implements portions of the 1995 Bay-Delta Plan with respect to the operation of the State Water Project and the Central Valley Project.

The Sacramento Valley 40-30-30 Index is used to determine the Sacramento Valley water year type for the purpose of implementing water quality objectives defined in D-1641. It also provides an estimate of the potential water supply originating in the basin from rainfall and snowmelt runoff, groundwater accretion, and reservoir carryover storage. The index incorporates seasonal differences in water contribution for the year and includes the prior year's conditions in order to establish a more reliable index of water availability. The 40-30-30 factors represent the percentage weight given to the following:

- (1) 40%—the current year's April through July Sacramento Valley unimpaired runoff;
- (2) 30%—the current year's October through March Sacramento Valley unimpaired runoff; and
- (3) 30%—the previous year's index with a cap of 10 million acre-feet (to account for required flood control reservoir releases during wet years).

The water year type is determined by the index value on a scale specific to the Sacramento Valley (as defined in D-1641).

Classification	Index (million acre-feet)
Wet	Equal to or greater than 9.2
Above Normal	Greater than 7.8 and less than 9.2
Below Normal	Equal to or less than 7.8 and greater than 6.5
Dry	Equal to or less than 6.5 and greater than 5.4
Critical	Equal to or less than 5.4

Water year type forecasts are made beginning in December. The Sacramento Valley 40-30-30 Index May 1 forecast (at the 50 percent exceedance level) determines the "official" water year type for implementing water quality and flow requirements contained in D-1641. The D-1641 objectives are conditioned by water year type and generally become less stringent during dryer years.

### San Joaquin Valley 60-20-20 Index

D-1641 uses a similar method to determine the water year type for the San Joaquin Valley. The San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) uses (1) the current year's April through July San Joaquin Valley unimpaired runoff (60 percent); (2) the current year's October through March San Joaquin Valley unimpaired runoff (20 percent); and (3) the previous year's San Joaquin Valley 60-20-20 Index (20 percent, with a cap of 4 maf to account for required flood control reservoir releases during wet years).

The water year type is determined by the index value on a scale specific to the San Joaquin Valley (as defined in D-1641).

Classification	Index (million acre-feet)
Wet	Equal to or greater than 3.8
Above Normal	Greater than 3.1 and less than 3.8
Below Normal	Equal to or less than 3.1 and greater than 2.5
Dry	Equal to or less than 2.5 and greater than 2.1
Critical	Equal to or less than 2.1

The San Joaquin Valley 60-20-20 Index May 1 forecast (at the 75 percent exceedance level) determines the "official" water year type for D-1641 San Joaquin River Vernalis flow standards.

62 percent of the water year precipitation fell during these months for Yosemite Headquarters and Grant Grove. Water year precipitation totals at those two sites were below average with 68 and 58 percent of their respective annual averages.

Further south, the cities of Los Angeles and San Diego were also below average, totaling 54 and 63 percent of their annual averages for the water year, respectively. San Diego received 2.2 inches of precipitation in December, which is 115 percent of the monthly average and about 33 percent of the total precipitation falling during the 2012–2013 water year.

The monthly totals for the 8SI for the water year are presented in Table 8-2. Precipitation totaled 46.2 inches, which was 92 percent of average. November and December were wet, registering 13.0 and 17.2 inches, respectively, and 206 and 205 percent of the monthly average, respectively. The total accumulated precipitation from December 1 through February 28, typically the wettest period in the Sierra Nevada, only amounted to 20.5 inches. The 17.2 inches in December

ranked as the ninth wettest month on record for the index. January and February were extremely dry months and ranked as the sixth and fourth driest months on record for the index, respectively. January and February combined were the driest on record for this period.

Taking the entire water year into consideration, approximately 66 percent of the water year total precipitation fell during November and December. The precipitation in November and December was primarily the result of a series of atmospheric river events.

### Mountain Snowpack

The precipitation that fell during water year 2012–2013 resulted in a mountain snowpack well below average throughout the State’s mountainous regions. Monthly statewide snowpack for the water year is shown in Table 8-3. Snow water equivalents shown in the table were obtained from daily snow sensor reports corresponding to the first day of each month. The statewide average snow water equivalent reported for April 1 was 13.2 inches or 47 percent of average. April 1 is typically the average annual date of peak snow accumulation. In 2013, however, mountain snowpack peaked during the second week of March at approximately 17.1 inches of snow water content.

### River Runoff

Statewide river runoff totaled 60 percent of average in the 2012–2013 water year. The monthly runoff totals for the SRR, the SJR, the TLR, and the Feather River are shown in Table 8-4. As shown, the water year runoff totals for all of these areas were well below average.

From a water supply perspective, the most closely monitored period is April through July. By the end of July, the April–July runoff was 47, 44, and 30 percent of average, for the three respective regions.

**Table 8-2 Northern Sierra 8-Station Precipitation Index for Water Year 2012–2013**

	Month	Precipitation (inches)	Percent of Monthly Average
2012	October	2.50	83
	November	13.00	206
	December	17.20	205
2013	January	1.40	23
	February	0.80	10
	March	3.70	54
	April	2.00	51
	May	1.30	62
	June	1.70	170
	July	0.00	0
	August	0.00	0
	September	1.50	167
<b>Total</b>		<b>46.20</b>	<b>92</b>

**Table 8-3 Statewide Mountain Snowpack for Water Year 2012–2013**

	Date	Snow Water Equivalent (inches)	Percent of Average	Percent of April 1 Average <sup>a</sup>
2012	October 1	0.0	0	0
	November 1	0.8	91	3
	December 1	4.2	91	15
2013	January 1	14.0	137	49
	February 1	15.2	87	54
	March 1	15.7	64	56
	April 1	13.2	47	47
	May 1	3.6	17	13
	June 1	0.1	0	0
	July 1	0.0	0	0
	August 1	0.0	0	0
	September 1	0.0	0	0

<sup>a</sup> April 1 is the average date of peak statewide mountain snowpack. This table is based on snow pillow (a device for measuring mountain snowpack at automated reporting stations) data.

## Water Supply Indices

The Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index) and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) were “dry” and “critical,” respectively, based on observed data for water year 2012–2013.

For more information, see the sidebar, Water Supply Indices.

## Water Year 2013–2014 October through December Water Conditions

The last three months of calendar year 2013 mark the beginning of a new water year, 2013–2014. October was a cool, dry month.

Statewide, the average precipitation for the month was 26.8 percent of the long-term average based on the California Data Exchange Center gauges. November was warm and dry with below normal precipitation. The 8SI registered 1.50 inches compared to an average value of 6.3 inches. December was another dry month. The 8SI registered 0.8 inches compared to an average of 8.4 inches. Statewide, the October through December precipitation was about 27 percent of normal.

At the end of December, water year runoff totals were 33 percent of average for the SRR, 16 percent of average for the SJR, and 29 percent of average for the TLR.

**Table 8-4 Unimpaired Runoff for Water Year 2012–2013 (million acre-feet)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
SRR runoff	0.38	1.14	3.61	1.14	0.91	1.35	1.34	0.77	0.54	0.36	0.32	0.33	12.19
percent of average	75	129	211	45	37	47	56	34	43	61	78	83	67
SJR runoff	0.02	0.09	0.48	0.20	0.16	0.37	0.68	0.66	0.26	0.07	0.04	0.01	3.05
percent of average	39	69	200	46	35	59	80	46	24	16	29	25	51
TLR runoff	0.02	0.04	0.09	0.08	0.07	0.13	0.23	0.24	0.10	0.04	0.02	0.02	1.09
percent of average	44	52	86	47	38	47	59	33	16	15	23	30	36
Feather River runoff	0.07	0.28	0.95	0.27	0.23	0.42	0.35	0.17	0.14	0.09	0.08	0.07	3.13
percent of average	65	137	243	47	41	58	54	28	42	61	78	79	69
Statewide runoff													
percent of average	64	105	195	40	31	45	62	38	30	35	58	72	60

SRR: Sacramento River Region  
Sacramento River above Bend Bridge, Feather River at Oroville, Yuba River near Smartville, American River below Folsom Lake

SJR: San Joaquin 4 Rivers  
Stanislaus River below Goodwin Dam, Tuolumne River below La Grange, Merced River below Merced Falls, San Joaquin River below Millerton Lake

TLR: Tulare Lake Region  
Kings River below Pine Flat Reservoir, Kaweah River below Terminus Reservoir, Tule River below Lake Success, Kern River below Lake Isabella

WY: Water Year (October 1–September 30)

## Storage

### Statewide Storage

Monthly storage totals for the major Sierra reservoirs are shown in Table 8-5. Water year 2012–2013 began at 95 percent of average reservoir storage following a dry 2011–2012 water year. The percent of average storage increased through December, which ended at 110 percent of average. Then, the average decreased each month through July, which ended with 79 percent of average. August and September had the same percent of average.

### State Water Project Storage

The State Water Project (SWP) operates a complex system of dams, canals, and reservoirs to collect and store water for future deliveries. Lake Oroville is the first of two primary SWP conservation facilities. Lake Oroville inflow comes from tributaries of the Feather River.

The San Luis Reservoir is the second primary SWP conservation facility. This Central California joint-use facility derives its inflow from pumping at the Gianelli Pumping-Generating Plant. San Luis is an off-stream storage reservoir. Most of the water is pumped into the reservoir from late fall to early spring. This water is temporarily stored, then released into the California

**Table 8-5 Monthly Reservoir Storage for Water Year 2012–2013 (thousand acre-feet)**

Reservoir	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta	2,466	2,564	3,318	3,474	3,611	3,711	3,788	3,363	2,938	2,434	2,101	1,906
percent of average	92	95	117	113	109	102	97	86	81	75	73	70
Oroville	1,826	1,862	2,525	2,692	2,848	2,982	3,040	2,812	2,558	2,144	1,783	1,633
percent of average	86	87	116	116	116	111	106	94	89	83	77	75
Folsom	396	404	584	566	552	601	682	734	665	525	429	361
percent of average	80	86	123	112	102	96	93	89	82	76	70	65
San Luis	674	807	1,098	1,212	1,221	1,299	1,110	785	425	319	465	504
percent of average	62	66	79	75	70	70	61	49	33	32	54	53
Pardee	181	186	180	174	166	171	184	192	197	195	195	190
percent of average	105	107	102	97	92	94	100	101	102	103	106	105
New Melones	1,477	1,503	1,594	1,636	1,600	1,554	1,457	1,334	1,253	1,159	1,087	1,047
percent of average	110	111	115	115	109	103	97	88	82	79	78	78
Don Pedro	1,184	1,190	1,327	1,373	1,399	1,408	1,471	1,473	1,390	1,253	1,135	1,077
percent of average	90	90	99	99	97	95	99	95	86	81	79	79
Millerton	280	263	298	312	325	316	330	403	405	363	304	317
percent of average	143	120	110	94	95	86	90	100	97	111	129	151
Pine Flat	202	214	257	293	324	363	435	484	358	189	153	154
percent of average	59	58	63	62	61	64	71	67	52	37	40	46
Kaweah	12	14	18	26	27	46	78	96	58	27	19	14
percent of average	106	109	117	126	109	114	102	80	55	53	100	112
Success	5	5	10	16	21	26	29	30	28	22	6	5
percent of average	58	53	82	92	85	79	66	55	56	64	32	40
Isabella	85	84	84	83	82	87	96	106	86	71	62	56
percent of average	52	54	53	48	45	44	42	35	28	26	29	30
Statewide												
percent of average	95	97	110	105	101	98	96	88	82	79	79	79

Aqueduct to meet SWP water contractor peaking demands in the summer months. The remaining SWP dams and reservoirs regulate the stored water supply with delivery patterns that are designed to fit local water demands.

**2013 Storage Totals in Major SWP Reservoirs**

End-of-year storage on December 31, 2013, in major SWP reservoirs and the State's share of joint-use reservoirs was 2.2 million acre-feet (maf) or 41 percent of maximum storage, compared to 2.3 maf or 44 percent of maximum storage at the end of 2012. The average end-of-month total storage in major SWP reservoirs for 2013 was 3.1 maf.

**Lake Oroville**

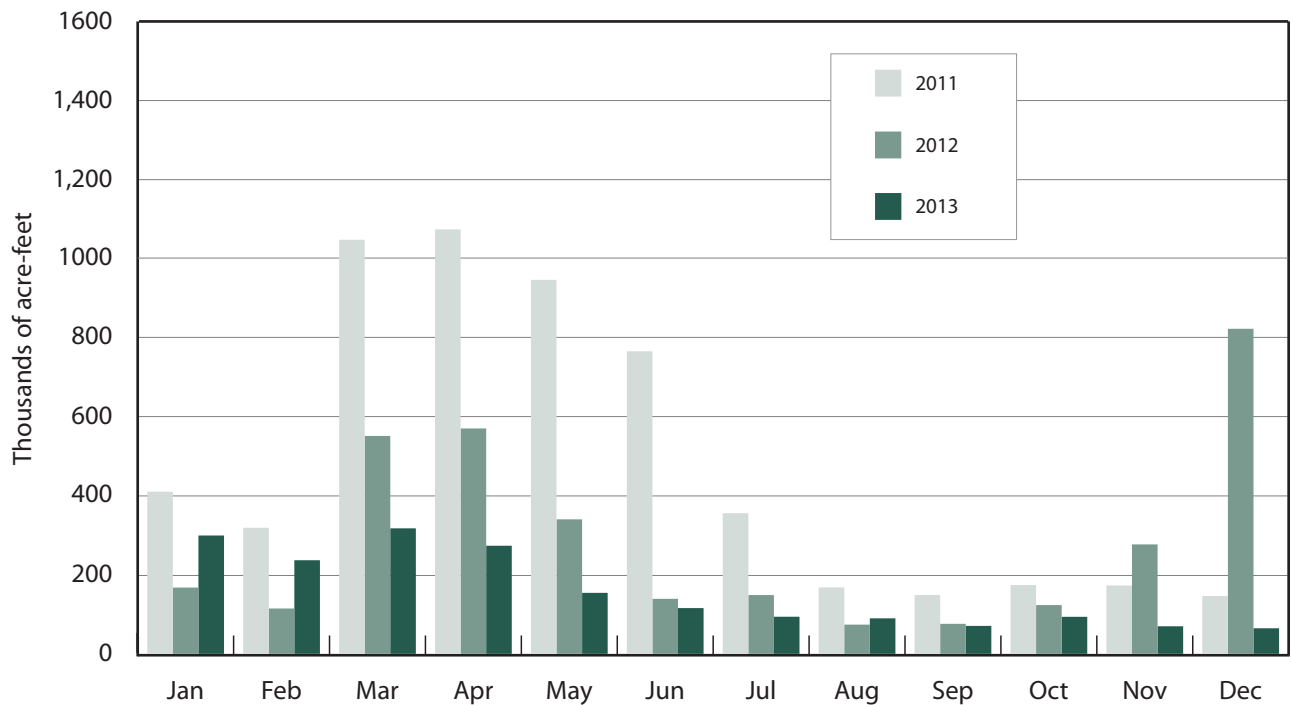
Lake Oroville has a maximum water storage capacity of 3,537,580 acre-feet (af). Runoff from the upper Feather River drainage is collected and stored in this reservoir and released to the Sacramento-San Joaquin

Delta through Oroville Dam, Thermalito Diversion Dam, and Thermalito Afterbay.

**2013 Inflow.** Lake Oroville inflow for 2013 totaled about 1.8 maf, which was 48 percent of the average (3.79 maf) over the last 30 years. Maximum daily inflow occurred on March 21 at 19,694 af. Minimum daily inflow occurred on December 10 at 170 af. Peak monthly total inflow occurred in March at 311,607 af, 17 percent of the 2013 total. The maximum total in the last 30 years (1984–2013) was in 1995 at 8,996,242 af. The minimum total for the same period was in 1994 at 1,566,352 af.

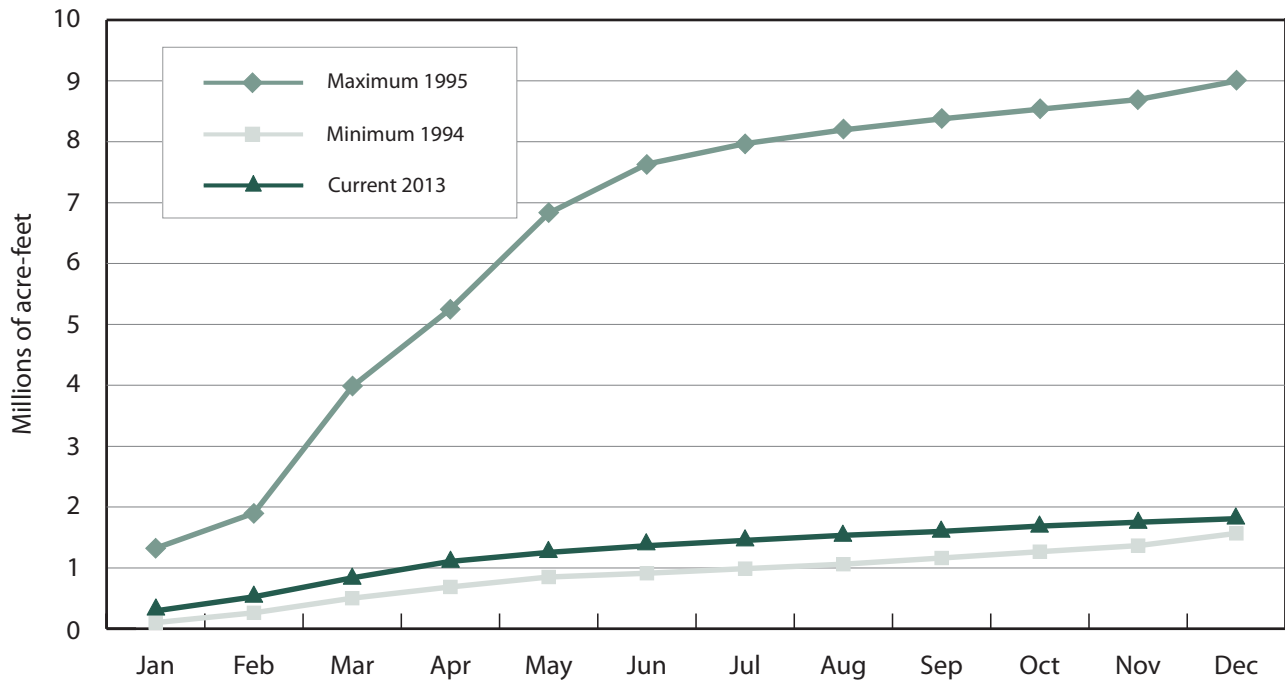
Figure 8-2 shows monthly Lake Oroville inflow for 2011, 2012, and 2013. Total Lake Oroville inflow for 2013 was 1,805,113 af.

Figure 8-3 shows historical (over the last 30 years) maximum and minimum cumulative Lake Oroville inflow (1995 and 1994, respectively) and the current cumulative inflow for 2013.



**Figure 8-2 Monthly Inflow into Lake Oroville from the Feather River, 2011–2013**





**Figure 8-3 Lake Oroville Cumulative Inflow over the Last 30 Years—Current and Historical Maximum and Minimum**

**2013 Storage.** Minimum storage occurred on December 31 at 1,286,039 af, 36 percent of lake capacity. Maximum storage occurred on April 23 at 3,111,046 af, 88 percent of lake capacity. End-of-year Lake Oroville storage was 1,286,039 af. Figure 8-4 shows storage in Lake Oroville for 2012 and 2013.

**2013 San Luis Reservoir Operations**

San Luis Reservoir is operated jointly by DWR and the Bureau of Reclamation pursuant to operating procedures adopted in June 1981. San Luis Reservoir has a normal operating capacity of 2,027,840 af. The SWP share of this capacity is 1,062,183 af.

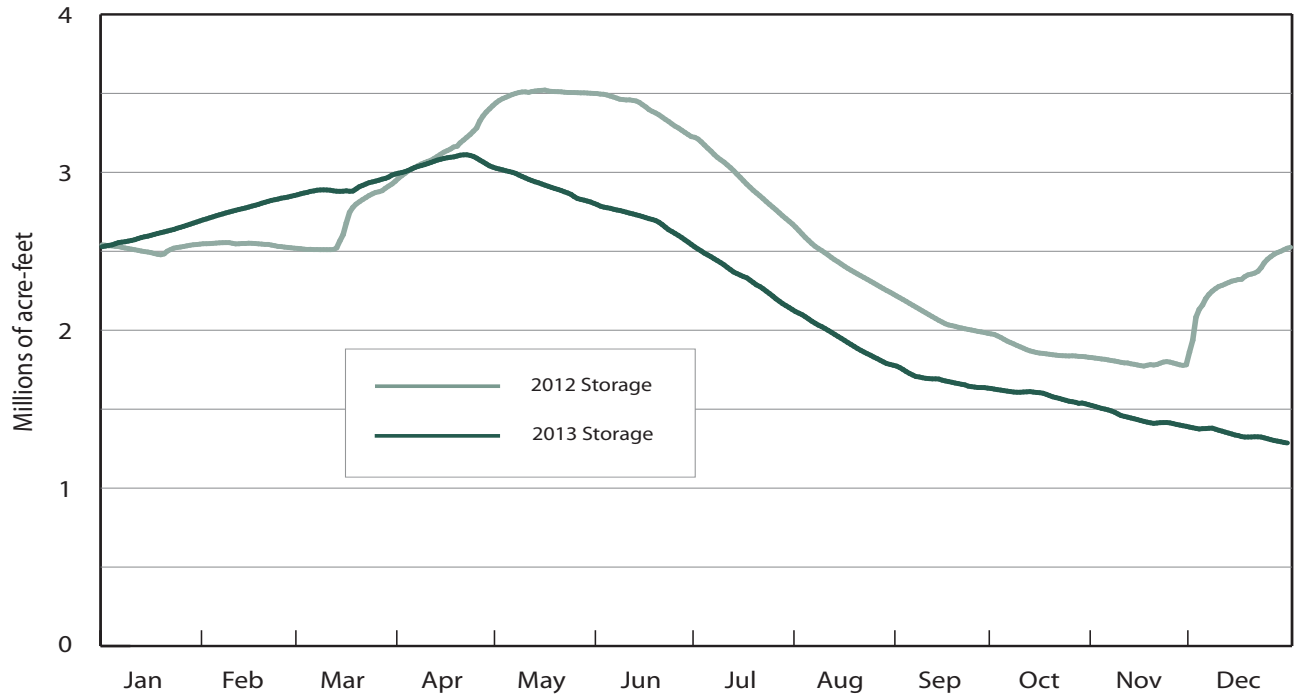
San Luis Reservoir reached its maximum storage on April 1 at 1,299,152 af, 64 percent of its normal maximum operating capacity. At the beginning of 2013, San Luis Reservoir contained 1,098,379 af, 54 percent of its capacity. The SWP storage share was

426,312 af. The highest end-of-month SWP share of water storage occurred on March 31 at 520,433 af. Figure 8-5 shows SWP shares of storage and total storage in San Luis Reservoir for 2012 and 2013.

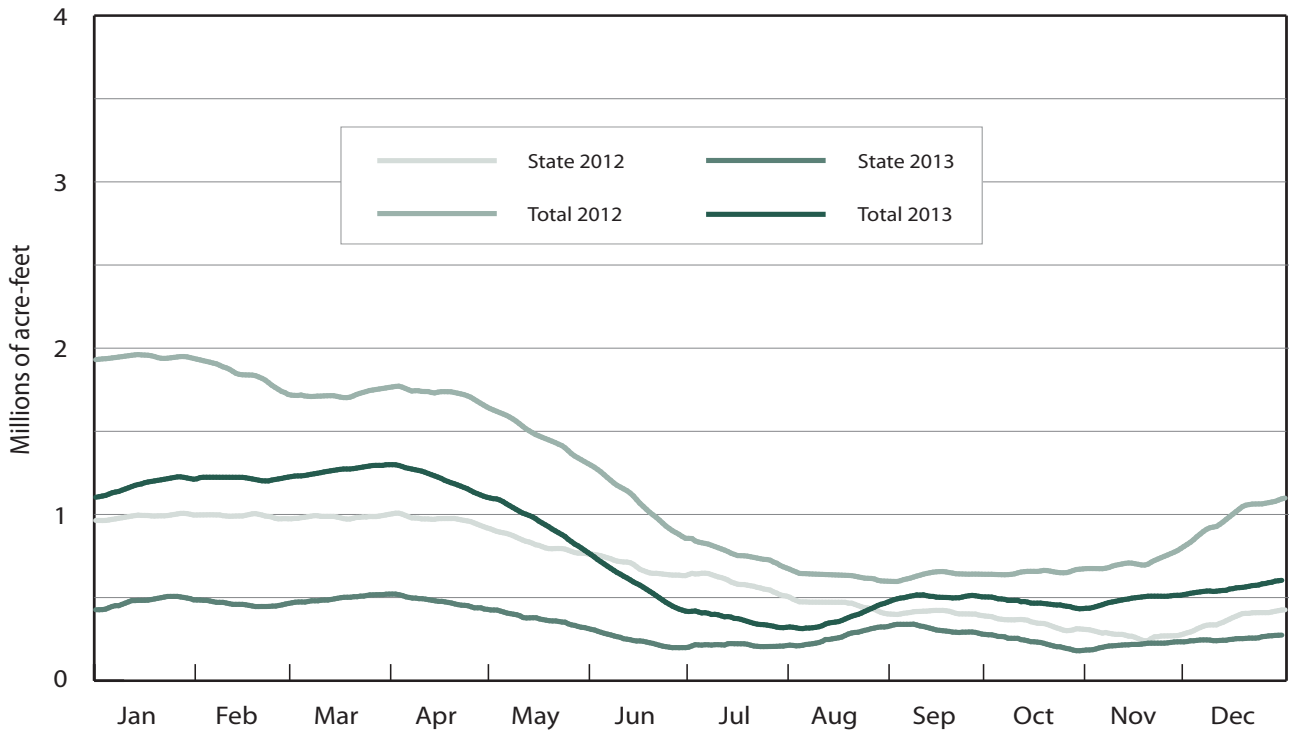
**2013 Lake del Valle Operations**

Lake del Valle, located off the South Bay Aqueduct, functions primarily as a storage facility for water delivery to Santa Clara and Alameda counties. At the beginning of 2013, Lake del Valle held 35,308 af, which was about 46 percent of its maximum capacity of 77,111 af. Its highest storage occurred on May 27 at 40,511 af. Its lowest storage occurred on December 29 at 29,694 af.

On December 31 storage in Lake del Valle was 29,712 af, 39 percent of its maximum capacity. There was 1,431 af of natural inflow into Lake del Valle, and 6,319 af of inflow from the South Bay Aqueduct. There were



**Figure 8-4 Storage in Lake Oroville, 2012 and 2013**



**Figure 8-5 Daily Storage in San Luis Reservoir, 2012 and 2013**

no releases to Arroyo Valle, and releases for 2013 to the South Bay Aqueduct from Lake del Valle totaled 10,868 af.

### **2013 Southern Reservoir Operations**

During normal operating conditions, DWR maintains its four southern reservoirs—Pyramid, Castaic, Silverwood, and Perris—at or near full operating capacity to ensure uninterrupted delivery of water to Southern California SWP water contractors.

At the beginning of 2013, these reservoirs held 598,653 af, which is 87 percent of their combined normal maximum operating capacity of 689,021 af. At the end of 2013, the reservoirs held 597,785 af, 87 percent of combined normal maximum operating capacity.

## **Diversions from the Delta**

The SWP diverts water from the Sacramento-San Joaquin Delta, through the Barker Slough and Banks pumping plants, for delivery to SWP water contractors' storage facilities. The SWP diverts water from Barker Slough Pumping Plant to the North Bay Aqueduct. Water is delivered from Banks Pumping Plant to the South Bay Area through the South Bay Aqueduct, and to the San Joaquin Valley, Central Coastal, and Southern California areas through the California Aqueduct. The Central Valley Project (CVP) diverts water to similar areas from the Delta through Jones Pumping Plant and Contra Costa Pumping Plant.

In 2013, the North Bay Aqueduct received 49,557 af of water from the Barker Slough Pumping Plant.

Figure 8-6 shows the amounts of water pumped each month for 2013 at Banks Pumping Plant, totaling 1,814,837 af. Of this amount, the SWP diverted 1,757,573 af. There was 19,311 af pumped for the Cross Valley Canal and 37,953 af of wheeling

for the CVP. All of the Cross Valley Canal and CVP pumping at Banks Pumping Plant occurred in April, July, August, and September.

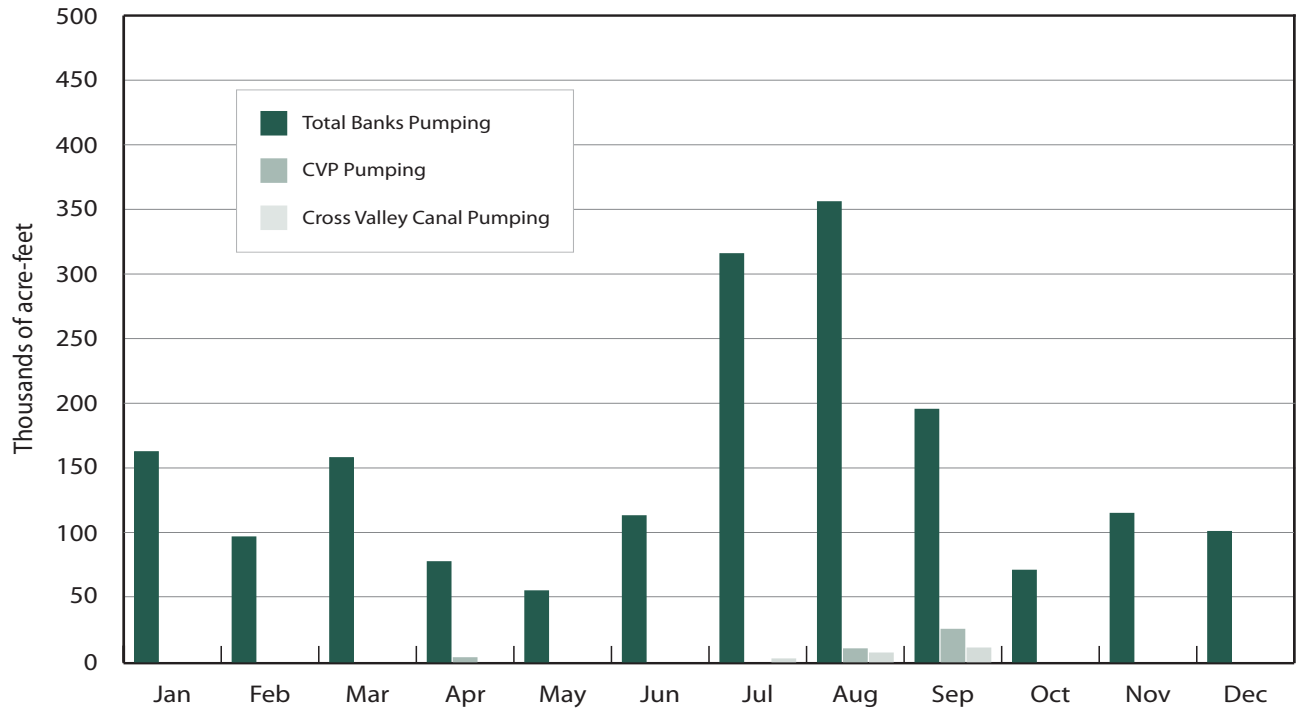
The CVP diverted 1,492,615 af at Jones Pumping Plant and 154,643 af at Contra Costa Pumping Plant in 2013.

The combined Delta exports include all of these plants. Figure 8-7 shows the monthly amounts of water diverted from the Delta in 2013 by the SWP and CVP. Maximum daily Delta exports occurred on August 25 at 23,631 af. Combined SWP and CVP monthly Delta exports in 2013 varied from a low of 105,901 af in April, to a high of 608,691 af in August. Delta exports totaled approximately 3.46 maf in 2013.

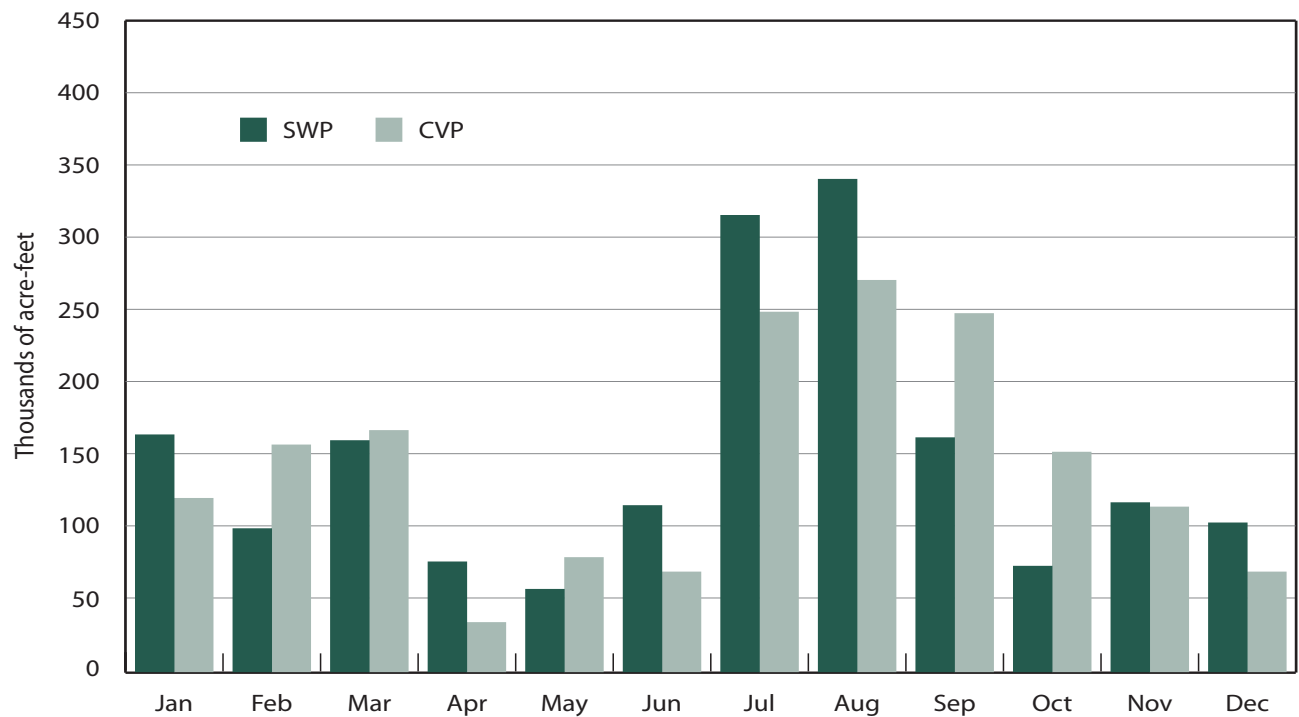
Figure 8-8 shows monthly total amounts pumped at Dos Amigos Pumping Plant for 2013. Dos Amigos Pumping Plant diverts water from O'Neill Forebay to the California Aqueduct. Dos Amigos pumped the largest amount in July 2013 at 404,274 af.

Figure 8-9 shows the amount of water pumped each month in 2013 at Edmonston Pumping Plant. Water pumped through the Edmonston Pumping Plant for delivery to Southern California totaled 1,216,034 af.

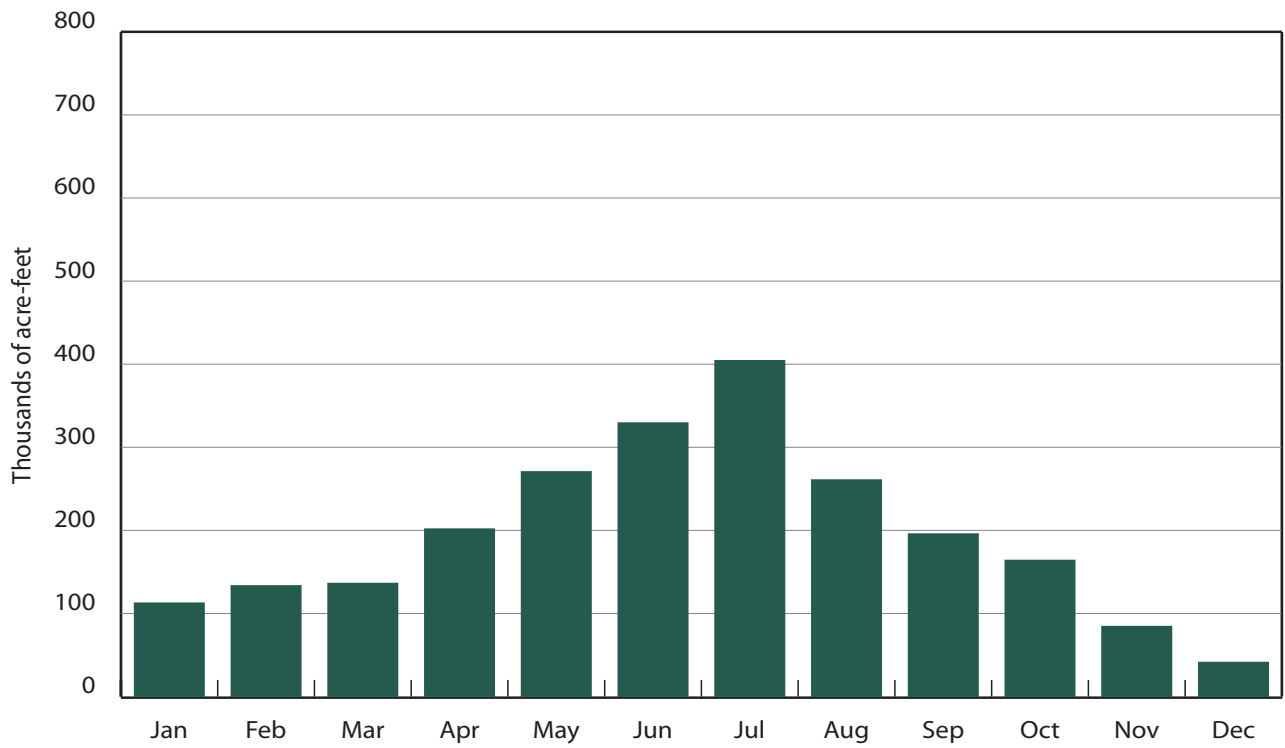
Additional water supply information can be found on DWR's website.



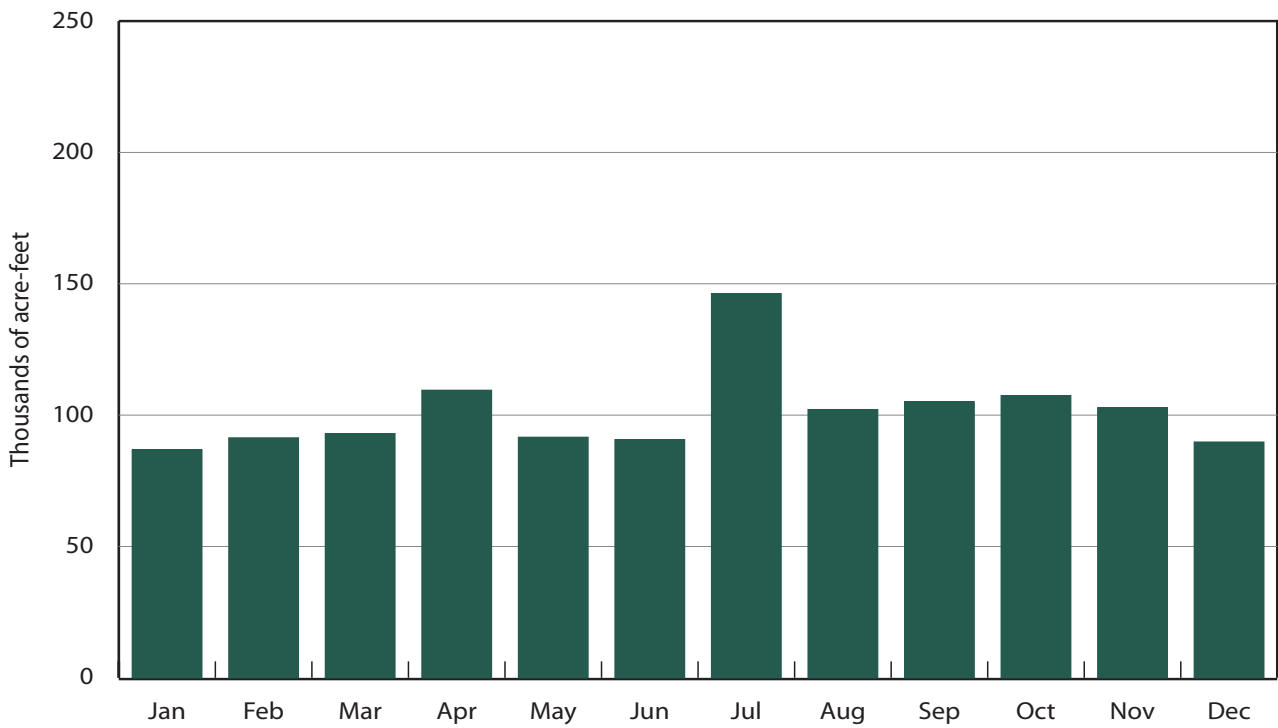
**Figure 8-6 Water Pumped at Banks Pumping Plant, 2013**



**Figure 8-7 Sacramento-San Joaquin Delta Exports by State Water Project and Central Valley Project, 2013**



**Figure 8-8 Water Pumped at Dos Amigos Pumping Plant, 2013**



**Figure 8-9 Water Pumped at Edmonston Pumping Plant, 2013**





## Chapter 9

# Water Contracts and Deliveries

*View of Pyramid Lake.*

## Significant Events in 2013

In 2013, a total of 3,371,000 acre-feet (af) of State Water Project (SWP) and non-SWP water was delivered to 29 long-term SWP water contractors and 23 other agencies. The portion delivered to SWP water contractors was 2,108,416 af; the portion to non-SWP agencies was 1,262,584 af.

The hydrologic conditions in the Sacramento and San Joaquin river watersheds were classified as “dry” and “critically dry.” As a result, DWR approved only 35 percent of the SWP water contractors’ Table A allocation requests.

One SWP water contractor stored 5,933 af of water in a banking program and six SWP water contractors recovered approximately 170,000 af of water from storage in 2013.

*Information for this chapter was provided by the State Water Project Analysis Office.*

The long-term water supply contracts between the Department of Water Resources (DWR) and 29 public agencies and local water districts provide for water service from the State Water Project (SWP) and are the basis for the SWP's construction and on-going operations. The State provides SWP financing, capital construction, improvements, and all operations and maintenance of SWP facilities, and the agencies and local districts have contractually agreed to repay all associated costs.

The water supply contracts also set forth the maximum amount of water a contractor may request each year from the SWP, and these water amounts are written within the contracts in a list format known as Table A. "Table A" or "Table A water" represents a portion or all of the annual Table A requested by SWP water contractors and approved for delivery by DWR based on various factors including hydrologic conditions, current reservoir storage, and combined requests from the SWP water contractors. Under certain conditions, DWR is not able to deliver the quantity of water requested by contractors. In these years, a proportional amount is allocated and delivered according to the long-term water supply contracts by prorating the amount in proportion to each SWP water contractor's annual Table A amount. Table A amounts may also be used as a factor to allocate other available water supplies to each contractor. Approved Table A amounts may also be referred to in this chapter as "approved amounts," "approved water," or "allocated water."

The long-term water supply contracts are amended as needed.

DWR also enters into agreements with SWP water contractors and other agencies, which may be amended periodically, to convey SWP and non-SWP water through the California Aqueduct and to approve the construction, operation, and maintenance of SWP facilities and turnouts/turn-ins. These agreements are also listed in this chapter.

The State Water Project Analysis Office (SWPAO) developed a numbering system for contracts, amendments, and agreements executed by DWR. These numbers, referred to as SWPAO numbers, are designated in Chapter 9 text as "SWPAO #XXXXX" and are located in parentheses after each contract, amendment, or agreement description. These numbers can be used as an identifier for anyone who contacts DWR staff for more detailed information on a particular document.

## Amendments to Long-term SWP Water Supply Contracts

All the original long-term water supply contracts signed by DWR, public agencies, and local water districts have been previously amended to incorporate mutually desired changes. Most amendments fall under the following general categories:

- (1) permanent transfers of Table A amounts from one SWP water contractor to another;
- (2) allocation of costs and benefits for the addition or enlargement of SWP facilities;
- (3) purchase of excess capacity in the California Aqueduct; and
- (4) provisions to implement Monterey Agreement principles.



## State Water Project Long-term Water Supply Contracts

The first water supply contract was signed with The Metropolitan Water District of Southern California (Metropolitan) on November 4, 1960. The contract was negotiated by the Department of Water Resources (DWR) and Metropolitan according to terms of the contracting principles for water service contracts announced by the Governor on January 20, 1960.

The Metropolitan contract became the prototype for all long-term water supply contracts. By the end of 1967, 31 agencies had contracted for water. In addition, a water supply contract was executed with the City of West Covina in December 1963, but it was terminated in August 1965; the city's Table A amount was transferred to Metropolitan through an amendment to the district's long-term contract with DWR. Long-term contracts with Hacienda Water District and Devil's Den Water District were also terminated when those districts transferred their Table A amounts, through contract amendments, to Tulare Lake Basin Water Storage District (1981) and Castaic Lake Water Agency (1992), respectively. Today the State Water Project (SWP) has long-term water supply contracts with 29 agencies. Those contracts have been amended periodically and as needed to incorporate mutually agreed upon modifications.

All water contracts signed in the 1960s included an estimate of the date water would initially be delivered and a schedule of the amount of water the agency could expect to be delivered annually (annual Table A amounts). That amount was designed to increase gradually until the maximum amount of annual Table A was reached. The total combined maximum annual Table A amount for all water contracting agencies was initially 4,230,000 acre-feet (af), assuming full development of the SWP.

The contracts were executed for 75 years or until all bonds sold as part of the California Water Resources Development Bond Act were repaid, whichever period was longer. As a result of amendments to contracts in the 1990s, the current combined maximum annual Table A amount totals 4,172,786 af, and the contracts are in effect for the longest of the following periods: (1) the project repayment period, which extends to 2035; (2) 75 years from the date of the contract; or (3) the period ending with the latest maturity date of any bond used to finance the construction costs of project facilities.

### 2013 Amendments to Long-term Water Supply Contracts

#### *Settlement with Four North-of-Delta Contractors*

DWR executed Amendment No. 21 to the water supply contract between the County of Butte (Butte) and DWR on December 31, 2013. The amendment incorporates provisions in the *Solano County Water Agency et al., v. DWR*

Settlement Agreement, Sacramento County Superior Court Case No. 34-2008-00016338 CU-BC-GDS, dated December 31, 2013, and provides for future allocations for Butte to lease some of its SWP supply. (SWPAO #13024)

DWR executed Amendment No. 20 to the water supply contract between Solano County Water Agency (Solano) and DWR on December 31, 2013. The amendment

incorporates provisions in the *Solano County Water Agency et al., v. DWR Settlement Agreement*, Sacramento County Superior Court Case No. 34-2008-00016338 CU-BC-GDS, dated December 31, 2013, including allocations and provides for future allocations for Solano and an Advanced Table A program. (SWPAO #13025)

DWR executed Amendment No. 24 to the water supply contract between Napa County Flood Control and Water Conservation District (Napa) and DWR on December 31, 2013. The amendment incorporates provisions in the *Solano County Water Agency et al., v. DWR Settlement Agreement*, Sacramento County Superior Court Case No. 34-2008-00016338 CU-BC-GDS, dated December 31, 2013, and provides for future allocations for Napa and an Advanced Table A program. (SWPAO #13026)

DWR executed Amendment No. 9 to the water supply contract between the City of Yuba City (Yuba) and DWR on December 31, 2013. The amendment incorporates provisions in the *Solano County Water Agency et al., v. DWR Settlement Agreement*, Sacramento County Superior Court Case No. 34-2008-00016338 CU-BC-GDS, dated December 31, 2013, and provides for future allocations for Yuba and an Advanced Table A program. (SWPAO #13027)

### **Decrease in Table A Amount**

DWR executed Amendment No. 20 to the water supply contract between Butte and DWR on September 11, 2013. The amendment provides for the reduction of Butte's Table A amounts retroactively for 2010 and 2011 to 1,731 acre-feet (af) and 2,548 af, respectively. (SWPAO #12018)

### **Permanent Transfer of Table A Amounts**

DWR executed Amendment No. 27 to the water supply contract between Dudley Ridge Water District (Dudley Ridge) and DWR on August 21, 2013. The amendment

provides for the permanent transfer of 1,993 af to decrease Dudley Ridge's annual Table A amount effective January 1, 2014. (SWPAO #13006)

DWR executed Amendment No. 35 to the water supply contract between Tulare Lake Basin Water Storage District (Tulare) and DWR on August 21, 2013. The amendment provides for the permanent transfer of 1,451 af to decrease Tulare's annual Table A amount effective January 1, 2014. (SWPAO #13007)

DWR executed Amendment No. 23 to the water supply contract between Antelope Valley-East Kern Water Agency (AVEK) and DWR on August 21, 2013. The amendment provides for the permanent transfer of 1,993 af to increase AVEK's annual Table A amount effective January 1, 2014. (SWPAO #13008)

DWR executed Amendment No. 24 to the water supply contract between AVEK and DWR on August 21, 2013. The amendment provides for the permanent transfer of 1,451 af to increase AVEK's annual Table A amount effective January 1, 2014. (SWPAO #13009)

## **Monterey Amendments**

The Monterey Amendments increase the reliability of existing water supplies, and increase water management flexibility, providing more tools for local water agencies to maximize use of existing facilities.

The Monterey Amendments include changes in allocation of Table A water, the transfer of Table A amounts and land, financial restructuring, and increased operational flexibility. The Monterey Amendments are discussed in detail in Chapter 1, Summary of Significant Events, Bulletin 132-95, found on the DWR website.



Plumas County Flood Control and Water Conservation District (Plumas) and Empire West Side Irrigation District (Empire) remain the only long-term SWP water contractors who have not signed the Monterey Amendments.

In accordance with the terms of the May 5, 2003, Monterey Settlement Agreement, the SWP continued to operate pursuant to the Monterey Amendments while the new environmental impact report (EIR) was being prepared. The draft EIR was released in October 2007 and is available on DWR's website. The final EIR was released in February 2010, and a notice of determination to proceed with the project was filed in June 2010. DWR continued to operate the SWP under the existing Monterey Amendments pursuant to the SWP long-term water supply contracts, including the Kern Water Bank transfer, and under the settlement agreement entered in the *Planning and Conservation League v. DWR* lawsuit. DWR was challenged by two groups of plaintiffs on issues relating to the adequacy of the EIR and the validity of the Monterey Amendments. The cases are currently being heard by the trial court. Final resolution of the issues is likely to take a number of years.

The settlement agreement is discussed in detail in Bulletin 132-04, Chapter 9, Water Contracts and Deliveries, available on DWR's website.

See Chapter 6, Legislation and Litigation, for the current status of the Monterey Amendment litigation.

## Miscellaneous Agreements with Long-term SWP Water Contractors

### 2013 Water Conveyance and Exchange Agreements

Water conveyance and exchange agreements that were executed or pending execution with long-term SWP water contractors during 2013 are described below.

#### *Castaic Lake Water Agency*

Castaic Lake Water Agency (Castaic Lake) entered into two separate change in point of delivery agreements to facilitate the exchange of Castaic Lake's SWP supplies. In 2007, Castaic Lake and Buena Vista Water Storage District (Buena Vista) entered into an agreement which allowed for Castaic Lake to acquire up to 11,000 af per year of high flow Kern River water from Buena Vista and store the water in the Rosedale-Rio Bravo Water Storage District (Rosedale-Rio Bravo) Groundwater Banking Program. Castaic Lake has stored in excess of 33,000 af of its Buena Vista water in Rosedale-Rio Bravo as follows:

- (1) A change in point of delivery agreement among DWR, Castaic Lake, and San Luis Water District (San Luis), a Bureau of Reclamation (Reclamation) contractor, executed August 13, 2013, approved the delivery of up to 11,000 af of Castaic Lake's approved SWP supplies to San Luis. In exchange, a like amount of Castaic Lake's Buena Vista water will be treated as Castaic Lake's SWP supplies in Rosedale-Rio Bravo for later use only within Castaic Lake's service area. The agreement terminates on June 30, 2014. During 2013, a total of 6,000 af of Castaic Lake's Table A water was delivered to San Luis. (SWPAO #13017)
- (2) A change in point of delivery agreement among DWR, Castaic Lake, and Kern County Water Agency (Kern) was executed September 25, 2013, and

approved the delivery of 22,000 af of Castaic Lake's approved SWP supplies to Kern. In exchange, a like amount of Castaic Lake's Buena Vista water will be treated as Castaic Lake's SWP supplies in Rosedale-Rio Bravo for later use only within Castaic Lake's service area. The agreement terminates on December 31, 2014. During 2013, a total of 11,000 af of Castaic Lake's SWP water was delivered to Kern, of which 7,177 af was Table A water and 3,823 af was Article 56(c) carryover water. (SWPAO #13018)

### ***Coachella Valley Water District***

A change in point of delivery and conveyance agreement among DWR, Coachella Valley Water District (Coachella), and Kern, executed July 30, 2013, provides for the annual delivery of up to 16,500 af of water acquired by Coachella through December 31, 2035. Glorious Land Company, LLC and Rosedale-Rio Bravo, a member unit of Kern, executed an agreement in 2005 to provide a water supply from Rosedale-Rio Bravo to Glorious Land Company's development project in Riverside County. Glorious Land Company is not yet ready to receive the water to which it is entitled under the 2005 Rosedale-Rio Bravo/Glorious Land Agreement. In 2012, Glorious Land Company and Coachella executed an assignment agreement, which allows Coachella to annually acquire up to 16,500 af of Rosedale-Rio Bravo's water under the 2005 Rosedale-Rio-Bravo/Glorious Land Agreement (Assigned Water). This change in point of delivery agreement allows for the delivery of the Assigned Water to Coachella by (1) a change in point of delivery of a portion of Rosedale-Rio Bravo's allocation of Kern's Table A water as an exchange for a like amount of Assigned Water, and (2) conveyance of the Assigned Water to Coachella under Article 55 of Coachella's long-term water supply contract by direct pump-in of the water into the California Aqueduct. In 2013, a total of 16,500 af of Kern's Table A water was delivered to Coachella. (SWPAO #12023)

### ***Crestline-Lake Arrowhead Water Agency***

A letter agreement among DWR, Crestline-Lake Arrowhead Water Agency (Crestline), and San Gorgonio Pass Water Agency (San Gorgonio), dated September 9, 2013, and executed September 13, 2013, provided for the delivery of up to 2,000 af of Crestline's Table A water stored in San Luis Reservoir to San Gorgonio. In exchange, San Gorgonio will return 1,300 af of its future Table A water to Crestline by December 31, 2023. There are no monetary payments between Crestline and San Gorgonio for this exchange. During 2013, a total of 2,000 af of Crestline's Article 56(c) carryover water was delivered to San Gorgonio under this agreement. (SWPAO #13021)

### ***Dudley Ridge Water District***

A letter agreement among DWR, Dudley Ridge, and Santa Clara Valley Water District (Santa Clara), dated June 28, 2013, and executed July 12, 2013, approved the conveyance of up to 3,100 af per year, minus Delta carriage water losses, on a 50/50 basis, of nonproject water to Dudley Ridge and Santa Clara through December 31, 2024. This nonproject water was made available by Browns Valley Irrigation District. During 2013, a total of 1,085 af was delivered to Dudley Ridge and 1,085 af was delivered to Santa Clara under this agreement. (SWPAO #13020)

A letter agreement among DWR, Dudley Ridge, and Westlands Water District (Westlands) dated November 22, 2013 and executed December 3, 2013, approved the transfer of up to 500 af of Dudley Ridge's 2013 Table A water to Westlands on behalf of Don Jackson, a landowner with farms in both Dudley Ridge's and Westlands' service areas. During 2013, a total of 500 af of Dudley Ridge's Table A water was delivered to Westlands under this agreement. (SWPAO #13023)

### ***Empire West Side Irrigation District***

A contract between DWR and Empire executed January 3, 2013, approved the delivery of unscheduled water to Empire in 2013 at times when SWP water is not needed for fulfilling Table A deliveries or for meeting project operational commitments. No unscheduled water was available for delivery to Empire during 2013. (SWPAO #13001)

### ***Kern County Water Agency***

An amendment between DWR and Kern, dated October 23, 2013, and executed on November 4, 2013, approved the delivery of up to 5,794 af of Kern's Table A water to Westlands' service area outside of Kings County for 2013–2014. The original agreement (SWPAO #06013) provided for the return of the water to be delivered only in the Kings County portion of Westlands' service area, which is within the SWP place of use. DWR filed a petition and received approval from the State Water Resources Control Board (SWRCB) to deliver SWP water outside the SWP place of use. The SWRCB order, adopted on July 1, 2012, approved the consolidation of the SWP and the Central Valley Project (CVP) places of use to meet urgent water needs. During 2013, a total of 2,144 af of Kern's Table A water was delivered to Westlands under this agreement. (SWPAO #06013-B and SWPAO #06013)

A change in point of delivery agreement among DWR, Kern, and Westlands was executed August 13, 2013, to facilitate the transfer of pre-1914 Kern River Lower River water rights water from the Nickel Family, LLC to Westlands. This agreement provided for the delivery of up to 15,946 af of Kern's 2013 Table A water to Westlands, and in exchange, Kern will retain a like amount of Nickel's pre-1914 water rights water for later use within its service area. This agreement is in effect through June 30, 2014. In 2013, a total of 8,393 af of water was delivered to Westlands. (SWPAO #13019)

### ***The Metropolitan Water District of Southern California***

A multiyear exchange and change in point of delivery agreement among DWR, Dudley Ridge, Kern, and The Metropolitan Water District of Southern California (Metropolitan), executed December 16, 2013, provides for the delivery of up to 8,700 af of Dudley Ridge's SWP supplies to Metropolitan by December 31, 2017. In exchange, Metropolitan will return a portion of its future SWP supplies equal to 50 percent of the total amount of water delivered to Dudley Ridge by December 31, 2022. This agreement allows for the delivery of a portion of Dudley Ridge's SWP supplies to either Metropolitan's service area and/or to Kern's turnouts for storage in Rosedale Rio-Bravo for later use by Metropolitan in its service area. No water was delivered under this agreement in 2013. (SWPAO #13012)

### ***Santa Clara Valley Water District***

An amendment to a letter agreement among DWR, Santa Clara, and Kern, dated January 7, 2013, and executed February 14, 2013, approves an additional point of delivery for the return of CVP water to Santa Clara in Reach 3 of the California Aqueduct. The original agreement (SWPAO #06012) provided for the conveyance of a portion of Santa Clara's CVP water for storage in the Semitropic Groundwater Banking Program and the future return of stored water to Santa Clara in Reach 9 of the South Bay Aqueduct by December 31, 2035. Under this agreement, 6,000 af was recovered by Santa Clara in 2013. (SWPAO #06012-A)

### ***Tulare Lake Basin Water Storage District***

A letter agreement among DWR, Tulare, and Kern, dated January 16, 2013, and executed March 15, 2013, approved the transfer of up to 10,000 af of Tulare's 2013 Table A water to Kern on behalf of JG Boswell Company, a landowner with farms in both Tulare's and Kern's service areas. This transfer allowed Boswell to augment its Kern water supply to meet crop requirements. No water was



delivered to Kern under this agreement in 2013. (SWPAO #13003)

A letter agreement among DWR, Tulare, and Westlands, dated February 1, 2013 and executed March 28, 2013, approved the transfer of up to 4,000 af of Tulare's 2013 Table A water to Westlands on behalf of Westlake Farms Incorporated, with farms in both Tulare's and Westlands' service areas. During 2013, a total of 1,121 af was delivered, completing this agreement. (SWPAO #13004)

A letter agreement among DWR, Tulare, and Kern, dated March 27, 2013, and executed May 8, 2013, approved the transfer of up to 7,500 af of Tulare's 2013 Table A water to Kern. The transfer was made on behalf of a landowner, Sandridge Partners Incorporated, with farms in both Tulare's and Kern's service areas. No water was delivered to Kern under this agreement in 2013. (SWPAO #13011)

A letter agreement between DWR and Tulare, dated May 31, 2013, and executed June 7, 2013, approved the conveyance of up to 10,000 af of Friant Recirculation Water in association with the San Joaquin River Restoration Program to Tulare. This nonproject water was made available by Lower Tule River Irrigation District to Tulare in exchange for a comparable amount of Tulare's local river supplies. Reclamation made this nonproject water available at O'Neill Forebay for DWR to convey to Tulare under Article 55 of Tulare's long-term water supply contract. This agreement terminates February 28, 2014. During 2013, a total of 5,000 af was conveyed to Tulare under this agreement. (SWPAO #13016)

A letter agreement between DWR and Tulare, dated February 21, 2013, and executed on February 26, 2013, approved the conveyance of up to 5,300 af of nonproject water to Tulare under Article 55 of Tulare's long-term water supply contract. This nonproject water

was made available by Fresno Slough Water District (4,000 af) and Mercy Springs Water District (1,300 af) for delivery to Angiola Water District, a member unit of Tulare. This agreement terminates February 28, 2014. No water was delivered under this agreement in 2013. (SWPAO #13002)

## Water Conveyance and Exchange Agreements Prior to 2013

### County of Butte

Three agreements were executed in 2012 among DWR, Butte, and several participating SWP contractors. The long-term water supply contract for Butte provides for a maximum Table A amount of 27,500 af per year. Butte determined that up to 24,000 af per year of its Table A water was not needed to meet its in-county demands for 2012 and 2013 and requested a transfer of up to 24,000 af per year of water to Palmdale Water District (Palmdale), Dudley Ridge, and Kern. Butte also determined that the difference of 3,500 af per year (27,500 af minus 24,000 af) may not be fully utilized by Butte for its in-county needs and requested a portion of the 3,500 af per year be available on a percentage basis to Palmdale, Dudley Ridge, and Kern (Additional Water). The three agreements terminate December 31, 2013. In 2013, Butte's allocated Table A water was transferred as follows:

- (1) An agreement among DWR, Butte, and Palmdale, executed August 3, 2012, approved the delivery of up to 10,000 af of Butte's allocated Table A water plus a portion of the Additional Water, if it becomes available, to Palmdale in 2012 and 2013. During 2013, a total of 3,256 af of Butte's Table A water was delivered to Palmdale under the agreement. (SWPAO #12015)
- (2) An agreement among DWR, Butte, and Dudley Ridge, executed August 3, 2012, approved the delivery of 14.34 percent of the water derived from the 14,000 af of Butte's allocated Table A water plus

a portion of the Additional Water, if it becomes available, to Dudley Ridge in 2012 and 2013. During 2013, a total of 727 af of Butte's Table A water was delivered to Dudley Ridge under the agreement. (SWPAO #12016)

- (3) An agreement among DWR, Butte, and Kern, executed August 3, 2012, approved the delivery of 85.66 percent of the water derived from the 14,000 af of Butte's allocated Table A water plus a portion of the Additional Water, if it becomes available, to Kern for four of its member units (Belridge Water Storage District, Berrenda Mesa Water Storage District, Lost Hills Water District, and Wheeler Ridge-Maricopa Water Storage District) in 2012 and 2013. During 2013, a total of 4,342 af of Butte's Table A water was delivered to Kern under the agreement. (SWPAO #12017)

### **County of Kings**

A long-term change in point of delivery agreement among DWR, County of Kings (Kings), and Tulare, executed March 10, 2006, approves the delivery of up to 200 af of Kings' annual Table A water to Westlands' turnouts. The water was conveyed to GWF Energy LLC for use within Kings' service area. This agreement is effective through December 31, 2035. During 2013, 10 af of Kings' Article 56(c) carryover water was delivered to Westlands' turnouts. (SWPAO #02031)

A long-term change in point of delivery agreement among DWR, Kings, and Westlands, executed March 24, 2004, approves the delivery of up to 5,000 af of Kings' annual Table A water through Westlands' turnouts for use at Lemoore Naval Air Station. The agreement is effective through December 31, 2035. During 2013, DWR delivered a total of 1,995 af to Westlands' turnouts, which included 581 af of Article 56(c) carryover water and 1,414 af of Table A water. (SWPAO #04005)

A long-term change in point of delivery agreement among DWR, Kings, and Westlands, executed May 6, 2008, provides for Kings' approved SWP supplies to be conveyed to specific Westlands' turnouts in the California Aqueduct. Kings requested the water for use on Westlands' agricultural lands within Kings' service area. This agreement is effective through December 31, 2035. During 2013, DWR conveyed a total of 6 af of Turn-Back Pool A water to Westlands' turnouts. (SWPAO #07010)

### **Dudley Ridge Water District**

A multiyear same landowner transfer agreement among DWR, Dudley Ridge, and Kern, executed June 13, 2011, provides for the delivery of a portion of Dudley Ridge's approved Table A water for same landowner transfers to Kern without any expected return through December 31, 2020. During 2013, a total of 6,941 af of Dudley Ridge's Table A water was delivered to Kern, of which 2,000 af was Article 56(c) carryover water and 4,941 af was Table A water. (SWPAO #10030)

A multiyear exchange agreement among DWR, Dudley Ridge, and San Gabriel Valley Municipal Water District (San Gabriel), executed September 14, 2010, approves the conveyance of Dudley Ridge's approved SWP supplies to San Gabriel effective January 1, 2010, through December 31, 2020. San Gabriel will provide for the return of its approved SWP water in future years through December 31, 2030. Terms and conditions of this agreement also covered Dudley Ridge's Table A water deliveries to San Gabriel during 2008. During 2013, a total of 672 af of Dudley Ridge's Table A water was conveyed to San Gabriel. (SWPAO #10013)

A letter agreement among DWR, Dudley Ridge, and San Gabriel, executed October 2, 2006, approved the delivery of a portion of Dudley Ridge's 2005 and 2006 approved SWP water supplies to San Gabriel's service area for groundwater recharge. This transaction helps both agencies in the management



of their water supplies, especially Dudley Ridge, whose main water source is the SWP. San Gabriel will return a like amount of its Table A water to Dudley Ridge by December 31, 2016. During 2013, a total of 1,500 af of San Gabriel's Table A water was delivered to Dudley Ridge's turnout at Reach 8D. (SWPAO #05017)

A multiyear exchange agreement among DWR, Dudley Ridge, and Tulare, executed September 7, 2012, approves multiyear water exchanges and same landowner transfers between Dudley Ridge and Tulare through December 31, 2035. This agreement allows for the delivery of up to 15,000 af per year for the years 2012–2035 of Dudley Ridge's and/or Tulare's approved Table A water for same landowner transfer to the other party without any expected return. During 2013, a total of 8,099 af of Tulare's Table A water was delivered to Dudley Ridge under this agreement. (SWPAO #12011)

### ***Empire West Side Irrigation District***

A long-term change in place of use agreement among DWR, Empire, and Westlands, executed March 3, 2011, approved annual delivery of up to 2,000 af of Empire's Table A water to Westlands through April 1, 2027. This transfer was made on behalf of two landowners, Brooks Farms and Newton Brothers, that farm in both Empire's and Westlands' service areas. DWR petitioned the SWRCB for a temporary change in place of use. The SWRCB issued an order authorizing the long-term change in place of use on November 21, 2011. During 2013, a total of 972 af of Empire's Table A water was delivered to Westlands. (SWPAO #10008)

### ***Kern County Water Agency***

A letter agreement between DWR and Kern, dated July 9, 2012, and executed July 18, 2012, approved the conveyance of up to 55,300 af of Kern-Tulare Water District's (Kern-Tulare) 2012 and 2013 CVP water to Kern under Article 55 of Kern's long-term

water supply contract. In exchange, Kern-Tulare will receive an equal amount of Kern's Table A water. This agreement terminates February 28, 2014. During 2013, a total of 6,660 af was delivered to Kern under this agreement. (SWPAO #12010)

A letter agreement between DWR and Kern, dated November 15, 2010, and executed November 19, 2010, approved the conveyance of up to 50,000 af of Westlands' 2010–2011 CVP water to Semitropic Water Storage District (Semitropic), a member unit of Kern, for storage and future return of a like amount of water to Westlands by December 31, 2021. Reclamation will make Westlands' CVP water available at O'Neill Forebay for conveyance by DWR to Semitropic under Article 55 of Kern's long-term water supply contract. In 2013, a total of 856 af of Kern's Table A water was provided to Reclamation at O'Neill Forebay for subsequent delivery to Westlands. (SWPAO #10022)

A long-term change in point of delivery agreement between DWR and Kern, executed June 8, 2000, approved the delivery of a portion of Kern's annual Table A water to Western Hills Water District (Western Hills). In exchange, Kern will receive a like amount of local water acquired by Western Hills in the Pioneer Groundwater Bank. The SWRCB approved Western Hills' service area to be included within the authorized SWP place of use on April 21, 2000. During 2013, a total of 1,156 af of Kern's Table A water was delivered to Western Hills. (SWPAO #01001)

### ***Mojave Water Agency***

The 1997 agreement (SWPAO #97003) among DWR, Mojave Water Agency (Mojave), and AVEK, executed on November 13, 1997, and an amendment (SWPAO #97003-A) executed on January 12, 2012 approved the delivery of up to 4,800 af per year of Mojave's approved SWP supplies to AVEK's turnouts through December 31, 2035. The agreement and the amendment

provide for the delivery of up to 1,800 af per year for use by a solar power generating plant, operated by Luz Solar Partners, Ltd. III-VII, and provide for the delivery of up to 3,000 af into AVEK's groundwater basin as a backup water supply to the plant in the event of an outage on the SWP. During 2013, DWR delivered 33 af of Mojave's Table A water to AVEK's turnout in Reach 19 of the California Aqueduct. (SWPAO #97003 and #97003-A)

### ***Napa County Flood Control and Water Conservation District***

A change in point of delivery agreement among DWR, Napa, and Solano, executed October 11, 2010, approved the conveyance of up to 500 af per year of the City of Vallejo's nonproject water from Solano's service area to Napa's service area under Article 55 of Napa's long-term water supply contract. The City of Vallejo, a member agency of Solano, has water rights to this nonproject water originating from Cache Slough and Lindsay Slough, tributaries of the Sacramento River. This agreement provides for the delivery of City of Vallejo's nonproject water through Reach 3B of the North Bay Aqueduct, located within Napa's service area. This agreement is effective through December 31, 2035. During 2013, a total of 500 af of water was conveyed under this agreement. (SWPAO #10005)

A change in point of delivery agreement among DWR, Napa, and Solano, executed December 26, 2001, approved the delivery of up to 628 af of Napa's annual Table A water to the City of Vallejo's Water Treatment Plant in Solano's service area. This water is further conveyed to the City of American Canyon, a member agency of Napa. The agreement is effective until December 31, 2035. A total of 60 af of Napa's 2013 Table A water was delivered to Solano's turnouts. (SWPAO # 00029)

### ***Palmdale Water District***

A letter agreement among DWR, Palmdale, and AVEK, dated May 1, 2012, and executed November 13, 2012, approved the delivery

of up to 10,000 af of Palmdale's 2011 SWP water supplies to AVEK. In exchange, AVEK will return 50 percent of the total amount delivered to AVEK, up to 5,000 af, of its future SWP supplies to Palmdale by December 31, 2021. During 2013, a total of 8 af of Palmdale's Article 56(c) carryover water was delivered to AVEK. (SWPAO #11020)

### ***Santa Barbara County Flood Control and Water Conservation District***

A letter agreement among DWR, Santa Barbara County Flood Control and Water Conservation District (Santa Barbara), and Kern, dated May 21, 2008, and executed July 24, 2008, approved the delivery of up to 1,000 af of Santa Barbara's 2008 Table A water to Kern. In exchange, Kern will return up to 500 af of its future allocated Table A water to Santa Barbara by May 1, 2013. In 2013, a total of 277 af of Kern's Table A water was delivered to Santa Barbara under this agreement. (SWPAO #08008)

A letter agreement among DWR, Santa Barbara, and Palmdale, dated February 28, 2011, and executed May 16, 2011, approved the exchange of up to 7,000 af of Santa Barbara's 2010 carryover water with Palmdale's future Table A water. To prevent the potential loss in the event that San Luis Reservoir would spill, Santa Barbara's 2010 carryover water was provided to Palmdale at O'Neill Forebay and subsequently delivered to Kern to facilitate a partial return of a previous water exchange between Palmdale and West Kern Water District, a member unit of Kern (SWPAO #07029, Bulletin 132-09). Palmdale will return all water to Santa Barbara by December 31, 2021. During 2013, a total of 362 af of Palmdale's Table A water was delivered to Santa Barbara. (SWPAO #11006)

A letter agreement (SWPAO #11019) among DWR, Santa Barbara, and Dudley Ridge, dated November 10, 2011, and executed

November 28, 2011, and an amendment (SWPAO #11019-A) dated April 6, 2012, and executed April 16, 2012, approved the delivery of up to 3,000 af of Santa Barbara's 2011 SWP supplies to Dudley Ridge. The water would be delivered at Dudley Ridge's turnouts in Reach 8D or to Kern's turnouts in Reaches 12E and 13B of the California Aqueduct for storage under a 2008 change in point of delivery agreement among DWR, Dudley Ridge, and Kern (SWPAO #08050). In exchange, Dudley Ridge will return two-thirds, less losses, of its future approved SWP supplies to Santa Barbara by December 31, 2021. In 2013, a total of 1,090 af of Dudley Ridge's Article 56(c) carryover water was delivered to Santa Barbara. (SWPAO #11019 and #11019-A)

A letter agreement (SWPAO #11018) among DWR, Santa Barbara, and Kern, dated November 10, 2011, and executed January 16, 2012, and an amendment (SWPAO #11018-A) dated June 18, 2012, and executed August 2, 2012, approved the delivery of up to 17,000 af of Santa Barbara's 2011 SWP supplies to Kern. In exchange, Kern will return two-thirds, less losses, of its future approved SWP supplies to Santa Barbara by December 31, 2021. During 2013, a total of 804 af of Kern's SWP supplies was delivered to Santa Barbara under this agreement. (SWPAO #11018 and #11018-A)

### **Solano County Water Agency**

A settlement agreement among DWR, Solano, and the cities of Fairfield, Vacaville, and Benicia, which includes conveyance service by Solano, was executed May 19, 2003. The agreement provides for delivery through December 31, 2035, of up to 31,620 af per year of settlement water to Solano for delivery through the North Bay Aqueduct to the three cities to help meet their current and future municipal and industrial water needs. During 2013, a total of 1,752 af of settlement water was delivered to Solano for conveyance to the three cities. (SWPAO #03017)

### **Tulare Lake Basin Water Storage District**

A letter agreement between DWR and Tulare, dated July 30, 2012, and executed July 31, 2012, approved the conveyance of up to 5,300 af of CVP water stored in San Luis Reservoir to Angiola Water District, a member unit of Tulare. This nonproject water was made available by Fresno Slough Water District (4,000 af) and Mercy Springs Water District (1,300 af). DWR conveyed this nonproject water from O'Neill Forebay to Tulare under Article 55 of Tulare's long-term water supply contract. The agreement terminated February 28, 2013. During 2013, a total of 1,054 af was conveyed to Tulare under this agreement. (SWPAO #12020)

A long-term change in place of use agreement among DWR, Tulare, and Westlands, executed January 7, 2011, approved the delivery of up to 8,000 af per year of Tulare's Table A water to Westlands' turnouts through April 1, 2027. The transfer was made on behalf of two landowners, Hansen Ranches and Newton Farms, that farm in both Tulare's and Westlands' service areas. DWR petitioned the SWRCB for a temporary change in place of use. The SWRCB issued an order authorizing the long-term change in place of use on November 21, 2011. In 2013, a total of 6,509 af was delivered to Westlands. (SWPAO #10006)

### **Introduction of Local Water Agreement**

An introduction of local water agreement between DWR and Kern, executed January 17, 2013, approved the introduction of Kern's local water into the California Aqueduct at Reach 12E (Cross Valley Canal Turnout No. 2) at Milepost 238.05. During 2013, no water was moved under this agreement. (SWPAO #12012)



## Turnout Agreements

### *Antelope Valley-East Kern Water Agency*

On August 21, 2013, DWR executed an amendment to the existing agreement with AVEK for modification, operation, and maintenance of the 294th Street West Turnout. The amendment allowed the connection and installation of a 24-inch steel pipeline within DWR's right of way for delivery of SWP water approximately 2,000 feet northwest to adjacent Tejon Ranch land for water banking purposes. The turnout, located at Milepost 308.05 of the California Aqueduct, maintains a maximum design capacity of 18 cubic feet per second.

### *San Luis Obispo County Flood Control and Water Conservation District*

On May 16, 2013, DWR executed an agreement with the San Luis Obispo County Flood Control and Water Conservation District (San Luis Obispo) and Central Coast Water Authority for construction, operation and maintenance of the Shandon Turnout. The turnout, to be located at Milepost 38.23 of the California Aqueduct's Coastal Branch, has a maximum design capacity of 3.5 cubic feet per second, depending on the operating conditions of the SWP.

## Activities Related to the Monterey Amendments

### *Storage of Water Outside SWP Contractor Service Areas*

Pursuant to Article 56(c) of the Monterey Amendments, seven SWP water contractors have separate agreements with DWR to convey approved water supplies outside their service areas for storage in existing and operational groundwater storage programs and for future recovery of water to use within their service areas. These change in point of delivery agreements are listed in Table 9-1. These agreements include provisions for conveyance to and from storage, and recovery methods by exchange and/or

pump-in to the California Aqueduct. During 2013, a total of 5,933 af was conveyed to storage, including losses, and 169,786 af was recovered from storage.

### *Turn-Back Water Pool Program*

Pursuant to Article 56(d) of the Monterey Amendments, the Turn-Back Water Pool Program for 2013 was initiated through "Notice to State Water Project Contractors, No. 13-04," dated February 12, 2013. All SWP water contractors who signed the Monterey Amendments were permitted to participate in the program. The program allowed SWP water contractors to offer a portion of their approved 2013 Table A water for sale in a turn-back pool for use by interested SWP water contractors. The program has two pools to buy and sell water: Pool A and Pool B. Based on Table A supply and demand, the turn-back water pool water was allocated among the purchasing contractors.

Initial offers for sales of Pool A of the Turn-Back Water Pool Program occurred in February 2013, with 4,110 af purchased under Pool A. Pool A turn-back water sold for \$23.17 per af (50 percent of the 2013 Delta Water Rate). There were no participants in Pool B of the program. The 2013 Turn-Back Water Pool Program closed on June 1, 2013. Notices to State Water Project Contractors describing the Turn-Back Water Pool Program are available online at DWR's website.

Table 9-2 lists SWP water contractors who participated in Pool A of the 2013 Turn-Back Water Pool Program.

**Area of Origin.** The Area of Origin Settlement Agreement in 2013 allowed County of Butte to reduce its 2010 Table A amount from 27,500 af to 1,731 af and its 2011 Table A amount from 27,500 af to 2,548 af. The Table A reductions were based on County of Butte's actual annual water demands and retroactively eliminated their ability to participate in 2010 and 2011 Turn-Back Water Pool Program activities.

**Table 9-1 Storage of Water Outside SWP Contractor Service Areas in 2013 (acre-feet)<sup>a</sup>**

Contractor	Contract Status	Storage Provider	To Storage (include losses, if any)	From Storage	Return By
<b>Alameda-Zone 7</b>					
SWPAO #99018	Continuing	Semitropic	0	4,000	2035
SWPAO #00037 <sup>b</sup>	Continuing	Semitropic	0	0	2035
SWPAO #01035 <sup>b</sup>	Continuing	Semitropic	0	0	2035
SWPAO #02010 <sup>b</sup>	Continuing	Semitropic	0	0	2035
SWPAO #03008 <sup>b</sup>	Continuing	Semitropic	0	0	2035
SWPAO #04017	Continuing	Semitropic	0	0	2035
SWPAO #06010	Continuing	Cawelo <sup>c</sup>	0	0	2035
<b>Alameda County</b>					
SWPAO #99017	Continuing	Semitropic	0	4,000	2035
SWPAO #00030	Continuing	Semitropic	0	0	2035
SWPAO #07005	Continuing	Semitropic	0	0	2035
SWPAO #10009	Continuing	Semitropic	0	0	2035
<b>Castaic Lake</b>					
SWPAO #02015 <sup>b</sup>	Continuing	Semitropic	0	0	2022
SWPAO #03060 <sup>b</sup>	Continuing	Semitropic	0	0	2024
SWPAO #05016	Continuing	Rosedale-Rio Bravo	0	0	2035
<b>Dudley Ridge</b>					
<i>SWP Water</i>					
SWPAO #08050	Continuing	Kern Water Bank	0	3,365	2035
SWPAO #09002	Continuing	Semitropic	0	0	2035
<i>Non-SWP Water</i>					
SWPAO #09040	Continuing	Kern Water Bank	0	0	2020
SWPAO #03053	Continuing	Cawelo	0	874	2035
<b>Metropolitan</b>					
SWPAO #95010	Continuing	Semitropic	0	47,179	2035
SWPAO #01013	Continuing	Arvin-Edison <sup>d</sup>	5,933	33,205	2035
SWPAO #03019	Continuing	Kern Delta <sup>e</sup>	0	10,000	2035
SWPAO #03057	Continuing	Mojave	0	0	2015
SWPAO #11011	Continuing	Mojave	0	20,663	2035
SWPAO #11022	Continuing	Rosedale-Rio Bravo	0	0	2017
<b>San Bernardino</b>					
SWPAO #11015	Continuing	Kern Delta	0	1,500	2035
<b>Santa Clara</b>					
<i>SWP Water</i>					
SWPAO #99016	Continuing	Semitropic	0	26,967	2035
SWPAO #00031	Continuing	Semitropic	0	12,033	2035
SWPAO #06011	Continuing	Semitropic	0	0	2035
SWPAO #10012	Continuing	Semitropic	0	0	2035
<i>Non-SWP Water</i>					
SWPAO #06012	Continuing	Semitropic	0	6,000	2035
SWPAO #10029	Continuing	Semitropic	0	0	2035
SWPAO #11012	Continuing	Semitropic	0	0	2035
<b>Total<sup>f</sup></b>			<b>5,933</b>	<b>169,786</b>	

<sup>a</sup> Storage amounts in this table may differ from the amounts in Table 9-9 due to water-type reclassification.

<sup>b</sup> Indicates amendments to agreement.

<sup>c</sup> Cawelo Water District

<sup>d</sup> Arvin-Edison Water Storage District

<sup>e</sup> Kern Delta Water District

<sup>f</sup> Total acre-feet indicates all water recovered from various water banks. Some of the recovered water may be temporarily stored in SWP facilities. Amounts include losses, if any.



**Table 9-2 2013 Turn-Back Water Pool Program (acre-feet)**

Contractor	Sold	Purchased
<b>Pool A</b>		
Ventura <sup>a</sup>	4,110	
Alameda-Zone 7 <sup>b</sup>		96
Alameda County <sup>c</sup>		50
Coachella		164
Kings		11
Desert <sup>d</sup>		66
Dudley Ridge		60
Kern (Agricultural)		1,165
Santa Clara		119
Metropolitan		2,267
Tulare		105
Oak Flat <sup>e</sup>		7
<b>Total</b>	<b>4,110</b>	<b>4,110</b>

<sup>a</sup> Ventura County Watershed Protection District

<sup>b</sup> Alameda County Flood Control and Water Conservation District, Zone 7

<sup>c</sup> Alameda County Water District

<sup>d</sup> Desert Water Agency

<sup>e</sup> Oak Flat Water District

A total of \$470,600 was returned to DWR resulting from County of Butte’s retroactive elimination from the 2010 and 2011 Turn-Back Water Pool Program.

During the 2010 Turn-Back Water Pool Program, County of Butte sold 1,283 af of Pool A water and 10,088 af of Pool B water. County of Butte received a total of \$120,479 for their 2010 Turn-Back Water Pool Program activities. Pool A water and Pool B water proceeds were \$24,441 and \$96,038, respectively.

Additionally, County of Butte sold 14,296 af of Pool A water and 4,765 af of Pool B water under the 2011 Turn-Back Water Pool Program. County of Butte received a total of \$349,581 for their 2011 Turn-Back Water Pool Program activities. Pool A water and Pool B water proceeds were \$299,644 and \$49,937, respectively.

### *Multiyear Water Pool Demonstration Program*

The experimental 2013–2014 Multiyear Water Pool Demonstration Program was initiated through an informational letter sent to all SWP contractors dated May 23, 2013. The program’s purpose was to demonstrate the feasibility of a multiyear water purchase program. All SWP water contractors were permitted to participate in the program as either buyers or sellers in either one or both years, 2013 and 2014. The program allowed SWP water contractors to offer portions of their approved 2013 Table A and Article 56(c) water for sale in a water pool for use by interested SWP water contractors. Based on Table A supply and demand, the pool water was allocated among the purchasing contractors into one of the two Buyer pools. The “69 Percent Pool” consisted of water purchased by Metropolitan and Kern, which together take up 69.36 percent of the total SWP Table A amount. The remaining 30.64 percent of the SWP Table A amount was available for the other SWP water contractors to purchase in the “31 Percent Pool.”

Initial offers for sales of water in the 2013 Multiyear Water Pool Demonstration Program occurred in June 2013, with 94,925 af purchased under this program. Multiyear Water Pool Demonstration Program water sold for \$253.00 per af, for a Table A allocation of 35 percent on June 1, 2013. The 2013 Multiyear Water Pool Demonstration Program closed on June 24, 2013.

Table 9-3 lists SWP water contractors who participated in the 2013 Multiyear Water Pool Demonstration Program.

**Table 9-3 2013 Multiyear Water Pool Demonstration Program (acre-feet)**

Contractor	Sold	Purchased
	<b>Pool MP</b>	
Napa	5,900	
San Luis Obispo	19,404	
Crestline	2,000	
Mojave	64,928	
Santa Barbara	2,693	
Alameda-Zone 7		2,500
Kings		989
Empire		319
Dudley Ridge		5,352
Kern		35,840
Santa Clara		10,630
Metropolitan		30,000
Tulare		8,295
San Geronio		1,000
<b>Total</b>	<b>94,925</b>	<b>94,925</b>

### Article 21 Water Program

Pursuant to the Monterey Amendments, Article 21 water replaces surplus, wet weather, and Article 12(d) water. The Article 21 Water Program allows an SWP water contractor to take delivery of water over the approved and scheduled Table A amounts for the current year. Article 21 water is only available for delivery on a short-term basis as determined by DWR when water is still available after operational requirements for SWP water deliveries, water quality, and Delta requirements are met. During 2013, no Article 21 water was delivered.

### Flexible Storage Program

Pursuant to Article 54 of the Monterey Amendments, the Flexible Storage Program provides SWP water contractors participating in the repayment of the capital costs of Castaic Lake and Lake Perris the option to withdraw water in excess of approved

deliveries. The program objective is to provide additional flexibility to benefit local water management activities. Participating SWP water contractors are given 5 years to replace withdrawn stored water with approved SWP or non-SWP water.

Flexible storage allows for withdrawal of up to 160,000 af at Castaic Lake and 65,000 af at Lake Perris. SWP water contractors participating in the Castaic Lake Flexible Storage Program include Metropolitan, Ventura County Watershed Protection District (Ventura), and Castaic Lake. These contractors are allowed to withdraw up to a maximum of 153,940 af, 1,377 af, and 4,683 af, respectively. Metropolitan is the only SWP water contractor allowed to withdraw water from Lake Perris, up to a maximum of 65,000 af. During 2013, there were no participants in this program.

### Extended Carryover Program

Pursuant to Article 56 of the Monterey Amendments, SWP water contractors can elect to store SWP water outside of their service areas and carry it over to the following year for use within their service areas. Qualified contractors can request the carryover of Table A water for delivery in the following year to the extent that such deliveries do not adversely affect current or future project operations. Factors that influence how much extended carryover water can be delivered include operational constraints of project facilities, filling of SWP conservation storage facilities, flood control releases, and water quality restrictions. If storage requests exceed the available storage capacity, the amount available is allocated among the SWP water contractors requesting storage in proportion to their annual Table A amount for that year. Twenty-three SWP water contractors took delivery of Article 56(c) in the amount of 350,555 af of previously approved Table A water carried over into 2013, as extended carryover.

## 2013 Dry Year Transfers

Due to the critically dry hydrologic conditions in 2013, a number of water supply agencies experienced significant water supply shortages. Two SWP contractors (Kern and Dudley Ridge) executed agreements with the State Water Contractors (SWC) to acquire transfer water to supplement their allocated SWP contract supplies. In addition to the SWC purchases, Alameda County Flood Control and Water Conservation District, Zone 7 (Alameda-Zone 7) received transfer water under a long-term transfer agreement with Byron Bethany Irrigation District (Byron Bethany). The SWP buyers executed water transfer conveyance agreements with DWR and seven agencies on the Feather, Yuba, and Sacramento rivers, the Sutter Bypass, and within the Delta.

San Luis & Delta-Mendota Water Authority (San Luis & Delta-Mendota) representing CVP contractors, purchased water for delivery to a number of its member agencies. In addition, Westlands purchased additional supplemental water supplies in 2013. DWR executed water transfer conveyance agreements with San Luis & Delta-Mendota and eight agencies on the Sacramento River to convey non-Project water through SWP facilities. DWR also executed three water transfer conveyance agreements with Westlands and agencies on the Feather, American, and Merced rivers.

A total of 86,497 af of water was made available to the SWP and CVP water transfer buyers in 2013. Transfer water was made available through crop idling, groundwater substitution, reservoir reoperation and a combination of reservoir release and groundwater substitution. See Table 9-4 for a list of sellers that provided water for transfer in 2013, and see Table 9-5 for a list of the SWP buyer activity. In addition to the water made available for transfer in 2013, a total of 67,079 af of transfer water made available to Kern and Dudley Ridge in 2012 that was stored in Lake Oroville due to SWP operational issues (see Bulletin 132-13,

Chapter 9). The 2012 transfer water was released and exported to Kern and Dudley Ridge in 2013. A total of 109,941 af of 2012 and 2013 transfer water was conveyed for SWP and CVP contractors through the Delta after carriage water losses and aqueduct conveyance losses assessed to non-SWP contractors were deducted. Carriage water losses of 30 percent were assessed for all transfer water originating in the Sacramento River watershed. A carriage water loss of 10 percent was applied to the transfer from the Merced River. All the transfer water was exported from the Delta during July through September.

## Lower Yuba River Accord

The Lower Yuba River Accord (Yuba Accord) was announced in 2005 to settle long-standing litigation over instream flows in the Yuba River in relation to fisheries. The purpose of the Yuba Accord is to resolve instream flow issues associated with the operation of the Yuba River Development Project in a way that protects and enhances lower Yuba River fisheries and local water supply reliability. The Yuba River Development Project provides revenues for local flood control and water supply projects, water to enhance SWP and CVP water supply reliability by offsetting Delta export reductions for the protection and restoration of Sacramento-San Joaquin Delta fisheries, and improvements in statewide water supply management, including dry year water supplies for participating SWP and CVP water contractors.

The Yuba Accord is based on three sets of agreements: a water purchase agreement with DWR, including water to help offset Delta export reductions and dry year water for participating SWP and CVP water contractors; conjunctive use agreements with Yuba member units; and a fisheries agreement resolving minimum flows. The Yuba Accord provides for higher releases into the Yuba River to benefit Chinook Salmon and steelhead, transfer water to help offset Delta export reductions annually, and dry year transfer water for SWP and CVP

**Table 9-4 Dry Year Transfers Seller Activity, 2013 (acre-feet)**

Sellers <sup>a</sup>	Buyers	SWPAO #	Transfer Action	Transfer Water Available
Butte WD	Kern	13-700	Groundwater	3,378
Cordua ID	Dudley Ridge	13-701	Groundwater	6,270
	Kern			
Garden Highway Mutual WC	Dudley Ridge	13-702	Groundwater	3,392
	Kern			
Sacramento Suburban WD	Dudley Ridge	13-703	Groundwater	2,823
	Kern			
Sutter Extension WD	Dudley Ridge	13-704	Groundwater	2,514
	Kern			
Tule Basin Farms, LLC	Dudley Ridge	13-705	Groundwater	2,626
	Kern			
Byron Bethany	Alameda-Zone 7	13-706	Crop Idling	2,238
Anderson Cottonwood ID	San Luis & Delta-Mendota	13-707	Groundwater	2,036
Conaway Preservation Group	San Luis & Delta-Mendota	13-708	Groundwater	5,049
Eastside Mutual WC	San Luis & Delta-Mendota	13-709	Groundwater	798
Glenn-Colusa ID	San Luis & Delta-Mendota	13-710	Groundwater	4,400
Pelger Mutual WC	San Luis & Delta-Mendota	13-711	Groundwater	1,522
Pleasant Grove-Verona Mutual WC	San Luis & Delta-Mendota	13-712	Groundwater	5,134
Reclamation District 1004	San Luis & Delta-Mendota	13-713	Groundwater	6,314
Te Velde Trust	San Luis & Delta-Mendota	13-714	Groundwater	1,247
Placer County WA	Westlands	13-715	Reservoir Reoperation	20,000
Thermalito Water and Sewer District	Westlands	13-716	Reservoir Reoperation	1,754
Merced ID	Westlands	13-717	Reservoir Reoperation	15,000
<b>Total</b>				<b>86,497</b>

<sup>a</sup>WD= Water District; ID= Irrigation District; WC= Water Company; WA= Water Agency

**Table 9-5 Dry Year Transfers Buyer Activity, 2013 (acre-feet)**

Buyers	Water Available to Buyer	Estimated Losses <sup>ab</sup>	Net Water Delivered
Dudley Ridge	1,024	307	717
Kern	19,980	5,994	13,986
San Luis & Delta-Mendota	26,501	8,321	18,180
Alameda-Zone 7	2,238	-	2,238
Westlands	36,754	8,888	27,866
<b>Total<sup>c</sup></b>	<b>86,497</b>	<b>23,510</b>	<b>62,987</b>

<sup>a</sup> Carriage water losses of 30 percent were applied to all transfers except the transfer from Merced Irrigation District in the San Joaquin River watershed which was assessed a 10 percent carriage water loss.

<sup>b</sup> Aqueduct conveyance losses of 2 percent or 3 percent was assessed on deliveries to non-SWP contractors based on the reach to which the water was delivered.

<sup>c</sup> Totals may not sum due to rounding.



water contractors from both surface and groundwater substitution sources.

The required agreements were executed in late 2007 and early 2008, and the SWRCB approved the Yuba Accord on March 25, 2008, setting the flow schedules for the river and authorizing accord-based water transfers through 2025. During that same period, DWR completed the execution of 22 agreements for dry year supplies for participating SWP and CVP water contractors under the accord.

In April 2009, two amendments to the Yuba Accord's water purchase agreement were executed. Amendment Number 1 resolved a technical issue related to refill accounting, and Amendment Number 2 addressed pricing issues for groundwater substitution water.

Amendment Number 3 was executed April 22, 2010, and addressed market pricing issues for groundwater substitution water.

On January 6, 2012, Amendment Number 4 to the Yuba Accord's water purchase agreement was executed. Amendment Number 4 provides for annual negotiations of groundwater substitution water pricing, prioritizing SWP water contractors' Delta export transfer supplies, and optionally suspending certain accounting rules to permit all groundwater substitution water to be classified as Component 4 water.

Under Amendment Number 4, all accrued groundwater substitution water is payable although it may not be exported. The single exception is that DWR and Yuba Accord water contractors will not be required to pay for the portion (if any) of groundwater substitution component water that is released in accordance with the provisions of the Yuba Accord Fisheries Agreement, Section 5.1.8, Supplemental Flows for Groundwater Substitution Programs. When New Bullards Bar Reservoir is releasing extra water due to a wet winter, Yuba may

not reduce releases or accrue groundwater substitution water during the following irrigation season.

A total of 166,086 af was transferred to DWR and participating SWP and CVP water contractors under the accord in 2008, 180,000 af was transferred in 2009, and 141,856 af was transferred in 2010. In 2011, excess conditions in the Delta prevented accounting of Yuba releases as transfer water for the entire summer transfer season.

In 2012, DWR and Reclamation signed an agreement (SWPAO #12300) to share, equally, Component 1 water made available from 2012 through 2015. The 2012 letter agreement between the respective project operations offices replaces a 2008 letter agreement that shared the water differently—namely that the project that experienced the greater export reductions at the Delta pumps would receive the initial share of Component 1 water until the reductions were equally offset; then the water would be shared equally. In the past, the SWP has experienced export reductions greater than the CVP by more than 60,000 af. The SWP has therefore been the beneficiary of the Component 1 water.

The 2012 letter agreement provides that:

- Component 1 water is shared equally from 2012 through 2015;
- as per the Yuba Accord, Component 1 water provided to Reclamation will be delivered at the Marysville gauge on the Yuba River; and
- DWR will provide conveyance at Banks Pumping Plant pursuant to the Joint Point of Diversion Agreement with Reclamation.

On April 17, 2013, DWR executed an annual letter agreement with Yuba setting a per-acre-foot price for Component 4 groundwater substitution water of \$190.00 per af in 2013. Yuba subsequently offered, and DWR purchased, 64,730 af of Component 4 water as part of the total 2013 transfer quantity of 177,274 af.



In May 2013, DWR initiated negotiations with Yuba on Amendment 5, which will address the required repricing of any transfer water that would be moved after September 30, 2015.

In 2013, 177,274 af was transferred, with 60,000 af of Component 1 water shared equally between DWR and Reclamation to help offset Delta export reductions to benefit fish. The Component 2, 3, and 4 dry year water deliveries were 15,000 af, 37,544 af, and 64,730 af, respectively, with half shared among 12 of the 21 participating SWP contractors and the other half shared among certain CVP contractors that are members of San Luis & Delta-Mendota. A total of 81,271 af of 2013 Yuba transfer water was conveyed through the Delta after carriage water losses. Aqueduct conveyance losses assessed to non-SWP contractors were also deducted. Carriage water losses of 30 percent were assessed for all transfer water originating in the Sacramento River watershed. In addition, 17,518 af of Yuba releases was backed into Lake Oroville during balanced conditions from October 1 through November 16, 2013, and was being held for release in 2014, provided it can be exported.

Table 9-6 shows Lower Yuba River Accord water deliveries in 2013.

## Agreements with Non-SWP Agencies

In addition to negotiating agreements with long-term SWP water contractors to provide for specified water deliveries, DWR also enters into agreements with other agencies to provide water conveyance service.

## Reclamation—Joint Point of Diversion

In 2012, DWR renewed the Joint Point of Diversion agreement (JPOD) with Reclamation. Under the JPOD, DWR makes excess SWP conveyance capacity available

to Reclamation for the conveyance of water from the Delta at Banks Pumping Plant. This includes (1) make up for curtailed water exports from Jones Pumping Plant associated with improving conditions for fish in the Delta; (2) replacing water exports foregone during maintenance and repair of CVP facilities between the Delta and O'Neill Forebay; and (3) Reclamation's share of Component 1 water provided under the Yuba Accord. As part of the JPOD, the first 21,000 af conveyed through Banks Pumping Plant for the months of July, August, and September of each year will include a charge for the temporary barriers in the Delta. This agreement is effective March 1, 2012, through February 29, 2016. (SWPAO #12300)

## Reclamation and Byron Bethany Irrigation District—Musco Family Olive Company

A pending agreement among DWR, Byron Bethany and Reclamation provides for the conveyance of up to 800 af of Byron Bethany's CVP water to repayment Reach 2A of the California Aqueduct for use by Musco Family Olive Company. DWR delivered a total of 516 af in 2013 under this pending agreement. (SWPAO #04300)

## Reclamation and Cross Valley Canal Contractors

Through eight, three-party contracts and associated changes in points of delivery (CVC Contracts) with Reclamation and Cross Valley Canal (CVC) water contractors, DWR conveys CVP water for CVC water contractors. The following eight CVP water contractors are defined as CVC water contractors: County of Fresno (Fresno), County of Tulare, Hills Valley Irrigation District (Hills Valley), Kern-Tulare Water District (Kern-Tulare), Lower Tule River Irrigation District (Lower Tule), Pixley Irrigation District (Pixley), Rag Gulch Water District (Rag Gulch), and the Tri-Valley Water District (Tri-Valley). Effective January 1, 2009,

**Table 9-6 Lower Yuba River Accord Water Deliveries, 2013 (acre-feet)<sup>a</sup>**

Participating Contractor	Purchased Water				Water Losses				Water Delivered			
	Allocated Component 2 Water	Allocated Component 3 Water	Allocated Component 4 Water	Total	Component 2 Water Losses	Component 3 Water Losses	Component 4 Water Losses	Total	Component 2 Water Delivered	Component 3 Water Delivered	Component 4 Water Delivered	Total
<b>SWP Contractor</b>												
Metropolitan	4,163	10,421	-	14,584	1,249	3,126	-	4,375	2,914	7,295	-	10,209
Kern	2,140	5,357	23,037	30,534	642	1,607	6,911	9,160	1,498	3,750	16,126	21,374
Alameda-Zone 7	176	440	700	1,316	53	132	210	395	123	308	490	921
Coachella	301	754	1,019	2,074	90	226	306	622	211	528	713	1,452
Kings	20	51	218	289	6	15	65	87	14	36	153	202
Desert	121	304	1,307	1,732	36	91	392	520	85	213	915	1,212
Dudley Ridge	110	274	1,180	1,564	33	82	354	469	77	192	826	1,095
Empire	7	16	70	93	2	5	21	28	5	11	49	65
Oak Flat	12	31	-	43	4	9	-	13	8	22	-	30
San Geronio	38	94	406	538	11	28	122	161	27	66	284	377
Santa Clara	218	545	2,344	3,107	65	164	703	932	153	382	1,641	2,175
Tulare	194	485	2,084	2,763	58	146	625	829	136	340	1,459	1,934
<b>SWP Contractor Total</b>	<b>7,500</b>	<b>18,772</b>	<b>32,365</b>	<b>58,637</b>	<b>2,250</b>	<b>5,632</b>	<b>9,710</b>	<b>17,591</b>	<b>5,250</b>	<b>13,140</b>	<b>22,656</b>	<b>41,046</b>
San Luis & Delta-Mendota	7,500	18,772	32,365	58,637	2,250	5,632	9,710	17,591	5,145	12,878	22,202	40,225
<b>Grand Total</b>	<b>15,000</b>	<b>37,544</b>	<b>64,730</b>	<b>117,274</b>	<b>4,500</b>	<b>11,263</b>	<b>19,419</b>	<b>35,182</b>	<b>10,395</b>	<b>26,018</b>	<b>44,858</b>	<b>81,271</b>

<sup>a</sup> Non-SWP water conveyed by DWR through the California Aqueduct will have a 2 percent conveyance loss, if the delivery point is within Reach 3, and 3 percent if the delivery point is within Reaches 4, 5, 6, or 7.

Rag Gulch consolidated under Kern-Tulare. DWR approved assignment of Rag Gulch's Interim Renewal Contract to Kern-Tulare on April 7, 2009.

During 2013, DWR conveyed a total of 36,975 af of CVP water for CVC water contractors under CVC Contracts as follows:

- Fresno, 18,843 af (SWPAO #12301);
- County of Tulare, 1,062 af (SWPAO #12302);
- Hills Valley, 630 af (SWPAO #12303);
- Kern-Tulare, 4,000 af (SWPAO #13302);
- Lower Tule, 6,220 af (SWPAO #13303); and
- Pixley, 6,220 af (SWPAO #13304).

### **Reclamation and Kern National Wildlife Refuge—U.S. Fish and Wildlife Service**

A letter agreement sent by DWR on September 17, 2012, and accepted by Reclamation on September 21, 2012, provided for DWR to deliver up to 30,500 af of CVP water to the Kern National Wildlife Refuge during the term of June 1, 2012, through September 30, 2028. Under this agreement, DWR conveys CVP water from the end of Reach 7 to Buena Vista's turnouts in Reaches 10A and 12E of the California Aqueduct. DWR conveyed a total of 20,176 af during 2013. (SWPAO #12309)

### **Reclamation and San Joaquin Valley National Cemetery—U.S. Department of Veterans Affairs**

A pending letter agreement among DWR, Reclamation, and the U.S. Department of Veterans Affairs provides for the conveyance of up to 850 af of CVP water to Reach 2B of the California Aqueduct for the U.S. Department of Veterans Affairs' San Joaquin Valley National Cemetery. DWR delivered a total of 247 af to the national cemetery through Reach 2B of the California Aqueduct in 2013 under this pending agreement. (SWPAO #10310)

### **San Luis & Delta-Mendota Water Authority—Oakdale Irrigation District and South San Joaquin Irrigation District**

An agreement among DWR, San Luis & Delta-Mendota Water Authority, Oakdale Irrigation District (Oakdale), and South San Joaquin Irrigation District (South San Joaquin) was executed on April 8, 2013. Oakdale and South San Joaquin agreed to release up to 80,000 af of water from Goodwin Dam, operated by Reclamation, to augment flows in the Stanislaus and San Joaquin rivers to benefit migratory fish between April 5 and May 29, 2013. The agreement also had a coincidental effect of increasing water supply conditions in the Delta to benefit both SWP and CVP operations. (SWPAO #13029)

## **Water Deliveries**

### **Table A Deliveries**

Each year, by October 1, the SWP water contractors submit initial requests for Table A deliveries allocated to them for use in the subsequent calendar year. Initial Table A allocation amounts for the coming year are made by DWR in December. They are based on operations studies that assume 90 percent exceedence of historical water supply (where exceedence refers to the possibility that water supply in the coming year will be exceeded by the historical water supply), current reservoir storage, and total requests by the SWP water contractors. Forecasts for the year are updated as hydrologic conditions change. Table A amounts are increased or decreased depending on both actual and projected hydrologic conditions, though decreases are rare as the 90 percent exceedence criterion is fairly conservative.

On October 1, 2012, SWP water contractors submitted initial requests for 2013 totaling 4.17 million acre-feet (maf).

DWR approved delivery of 1.25 maf on November 29, 2012, resulting in initial Table A amounts of 30 percent of most SWP water contractor requests. DWR increased the 2013 Table A amounts to 1.46 maf, for a final allocation of 35 percent, on March 22, 2013. Table 9-7 lists the changes in Table A amounts that were approved by DWR based on updated hydrologic conditions.

### 2013 SWP Deliveries

The SWP delivers water for a variety of beneficial uses. In addition to delivering Table A water to SWP water contractors, the SWP:

- conveys water to other public and local agencies through special contracts and agreements;
- provides water for wildlife and recreational uses; and
- stores, releases, and delivers local runoff water from SWP facilities to agencies that hold local water rights.

In 2013, 3,371,000 af of SWP and non-SWP water was delivered to 29 long-term SWP water contractors and 23 other agencies.

The portion delivered to the SWP water contractors was 2,108,416 af, categorized as follows:

- 1,084,692 af of Table A water;
- 54,115 af of transferred Table A water;
- 32,329 af of exchanged Table A water;
- 98,732 af of Turn-back Pool A water;

**Table 9-7 2013 Allocated Table A Amounts**

Notice to SWP Contractors No.	Allocation Amount (maf)	Percentage of Requested Water
12-11	1.25	30
12-12	1.67	40
13-09	1.46	35

- 350,555 af of carryover water;
- 326,050 af recovered from water banks and delivery of backup water;
- 1,752 af of settlement water;
- 2 af of SWP water for recreation and fish and wildlife;
- 41,048 af of 2013 Yuba Accord Dry Year Purchase Program water;
- 8,048 af of local water;
- 67,410 af of Other Temporary Transfer Programs;
- 30,299 af of general conveyance water;
- 842 af of operations exchange water;
- 1,085 af of transfer water; and
- 11,457 af of permit water.

The remaining portion was delivered to 23 non-SWP agencies and totaled 1,262,584 af, which was categorized accordingly:

- 1,192,836 af of local water;
- 1,639 af recreation and fish and wildlife; and
- 68,109 af delivered to satisfy agreements between the SWP and CVP.

Figure 9-1 shows amounts of water delivered to various locations during 2013.

Specific information about water deliveries made to SWP water contractors and other agencies during 2013, and historical deliveries from 1962 through 2013, is presented in the following three sections, each with a corresponding table located at the end of the chapter:

- Water Delivered to Long-term SWP Water Supply Contractors in 2013, by Service Area (Table 9-8);
- Total Amounts of Water Delivered in 2013, by Month (Table 9-9); and
- Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2013 (Table 9-10).





**Figure 9-1 Water Delivered in 2013 and Delivery Locations of Long-term Water Supply Contractors and Feather River Area Districts with Water Rights Agreements with DWR**



Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than was available at the time of publication, please consult the most recent edition of Bulletin 132 and/or contact DWR staff in the State Water Project Analysis Office.

### **2013 Water Deliveries to Long-term SWP Water Contractors**

Table 9-8 shows amounts delivered in 2013 by service area. The following information is arranged by column number.

#### ***Table A Water Delivered***

Columns 1 through 6 show a detailed breakdown of Table A water delivered for SWP water contractors in 2013.

#### ***Turn-Back Pool Water***

Column 4 shows 98,732 af of Turn-Back Pool Water delivered to SWP water contractors in 2013.

#### ***Carryover Table A Water Delivered in 2013***

Column 5 shows a total of 350,555 af was carried over from previous years for delivery in 2013.

The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating the contractors to use or lose water by December 31 of each year. The SWP water contractors' long-term contracts and amendments state the criteria for carrying over Table A water from one year to the next under Articles 12(e), 14(b), and 56(c).

#### ***Total Table A Water Delivered***

Column 6 shows all Table A water delivered in 2013—a total of 1,620,423 af.

#### ***Article 21***

Column 7 shows Article 21 water delivered to SWP water contractors. In 2013, no Article 21 water was delivered.

#### ***Other SWP Water***

Column 8 shows 1,752 af of other SWP water. Other SWP water consist of settlement water delivered to Solano.

#### ***Total SWP Water Delivered***

Column 9 shows 1,622,175 af of total SWP water was delivered in 2013. This includes total Table A water, Table A carryover water, Turn-Back Pool Program water, and other SWP water consisting of settlement water.

#### ***Non-SWP Water Deliveries***

Columns 10 and 11 include deliveries of non-SWP water to long-term water contractors. Column 10 shows 326,050 af of water bank recovery water and delivery of previously backed up water. Column 11 shows 160,191 af of other non-SWP water. Other non-SWP water is local and permit water that an SWP water contractor has a water right to, or has purchased from, exchanged with, or transferred from non-SWP agencies.

#### ***Total Deliveries***

Column 12 shows total amounts of water delivered to SWP water contractors. In 2013, the SWP delivered 2,108,416 af of water to 29 long-term contractors.

### **Water Delivered in 2013 by Month**

During 2013, the SWP provided water service to 52 agencies, including 29 long-term SWP water contractors. Those agencies and the amounts of water delivered to them by month are listed in Table 9-9 and are summarized below as SWP water and non-SWP water.

### **SWP Water**

SWP water, as defined in the long-term water supply contracts, includes Article 21 water, carryover Table A water, current year Table A amounts, transfer and exchange of Table A water, and Turn-Back Pools A and B. Detailed information concerning those conveyances for 2013 is found under the “Miscellaneous Agreements with Long-term SWP Water Contractors” section in this chapter.

### **Non-SWP Water**

In 2013, DWR used SWP facilities to convey non-SWP water for various agencies according to the terms of water rights and water transfer and exchange agreements. Detailed information concerning those conveyances is in this chapter.

**Last Chance Creek Water District.** Under the water supply agreement between DWR and Last Chance Creek Water District, dated April 29, 2013, a total of 6,335 af was supplied from Frenchman Lake to Last Chance Creek Water District.

**Water Rights Water.** Water in this category is transported through SWP facilities to agencies with settlement agreements with DWR. Some water passes through SWP transportation facilities; some is stored in SWP reservoirs for release later. In 2013, the following water was delivered to the Feather River, Delta, North Bay, South Bay, and Southern California areas, as summarized below.

**Feather River Area.** Seven non-SWP agencies received 1,153,224 af, under their water right settlement agreements, as follows:

- Western Canal Water District, 356,202 af;
- Joint Water Districts Board, 768,365 af;
- Oswald Water District, 1,312 af;
- Tudor Mutual Water Company, 3,223 af;

- Garden Highway Mutual Water Company, 14,078 af;
- Plumas Mutual Water Company, 9,265 af; and
- Valberde and Ramelli, 779 af.

DWR conveyed local water totaling 7,076 af through SWP facilities on behalf of two non-SWP agencies:

- Thermalito Water and Sewer District (formerly Thermalito Irrigation District), 2,173 af and
- South Feather Water and Power Agency (formerly Oroville-Wyandotte Irrigation District), 4,903 af.

**Delta.** In the Delta, 26,201 af of water was delivered to Byron Bethany pursuant to the May 28, 2003, *Agreement Between the Department of Water Resources of the State of California and the Byron-Bethany Irrigation District Regarding the Diversion of Water from the Delta*.

**North Bay Area.** Deliveries in the North Bay area included 500 af of Vallejo permit water delivered to Solano, and 1,752 af of water delivered pursuant to the May 19, 2003, *Settlement Agreement among DWR, Solano County Water Agency, and the Cities of Fairfield, Vacaville, and Benicia*.

**South Bay Area.** In the South Bay area, a total of 7,960 af of local water was delivered to Alameda-Zone 7 and Alameda County. These two South Bay Aqueduct SWP water contractors hold water rights to runoff from the Lake del Valle watershed.

**Southern California Area.** In the Southern California area, 0 af of local runoff from the Houston Creek watershed was stored and delivered to Crestline-Lake Arrowhead Water Agency (Crestline) under water rights held by DWR on Houston Creek. The authorized place of use is limited to the Crestline Lake Arrowhead area.

## Annual Table A Water and Water Delivered Since 1962

Information about 2013 annual Table A water and water conveyed, by type, for the previous 50 years is contained in Table 9-10. The following discussion of conveyed Table A water is arranged according to column numbers.

### Annual Table A Water

Columns 1 through 7 of Table 9-10 show the amount of SWP water contractors' annual Table A water by area for years 1962 through 2013 as specified in the Table A schedules of the long-term water supply contracts.

In some instances, Table A schedules—projections of each contractor's need for water to 2035—have been amended to meet the needs of individual contractors. The amounts of annual Table A water each SWP water contractor may request for years 1962 through 2035 can be found in Table B-4 in Appendix B in the back of this bulletin.

### Water Delivered

Columns 8 through 16 show water delivered or conveyed, including initial fill water and operational losses and storage changes.

**Table A Water.** Column 8 shows amounts of Table A water delivered each year from 1962 through 2013. In 2013, a total of 1,620,423 af of Table A water was delivered.

### Article 21 and Unscheduled Water.

Column 9 shows amounts of Article 21 water, as defined under SWP deliveries, and unscheduled water delivered from 1962 through 2013. Article 21 and unscheduled water are water in excess of that required to meet all demands for the year's Table A water and water to be stored in SWP reservoirs. In 2013, no Article 21 or unscheduled water was delivered.

**Other Water.** Column 10 includes amounts of water classified as other water delivered in 2013, including non-SWP water conveyed through SWP facilities and regulated delivery of local supply. In 2013, a total of 582,301 af of other water was delivered.

**Feather River Diversions.** Column 11 includes amounts of water from the Feather River delivered according to agreements with non-SWP agencies on the Feather River, including Last Chance Creek Water District. In 2013, a total of 1,166,635 af in this category was delivered to agencies in the Feather River area.

**Recreation Water.** Column 12 shows water conveyed for recreational use or to improve water quality for fish and wildlife. In 2013, a total of 1,641 af of SWP water was conveyed for this purpose.

**Initial Fill Water.** The quantities listed in Column 14 represent the amounts used to initially fill the aqueducts and reservoirs south of the Delta to maximum operating capacities. Initial filling began in 1962, with the filling of the SBA, and was completed in 1979, when Lake Perris reached its maximum operating capacity of 127,000 af. In 1996 and 1997, the Coastal Aqueduct was initially filled.

**Operational Losses.** Column 15 includes the total amounts of water lost through evaporation and seepage, net storage changes in reservoirs south of the Delta, and amounts of inflow from local drainage areas, including inflows into San Luis Canal and from the Kern River Intertie. Negative values are indicated for years when withdrawals and evaporation from reservoirs south of the Delta exceed the amounts of water added to the reservoirs.

**Table 9-8 Water Delivered to Long-term SWP Contractors in 2013, by Service Area (acre-feet)<sup>a</sup>**

SWP Contractor	Table A Water Deliveries							SWP Water			Non-SWP Water		
	2013 Table A Not Transferred, or Exchanged, or Stored [1]	2013 Table A Transferred or Exchanged [2]	2013 Table A Stored [3]	2013 Turn-Back Pools [4]	Carryover Water [5]	Total Table A [6]	2013 Article 21 [7]	Other SWP Water [8]	Total SWP Water [9]	Water Bank Recovery [10]	Other Non-SWP Water [11]	Total Water Delivered [12]	
<b>Feather River</b>													
Butte	908	8,325	-	-	-	9,233	-	-	9,233	-	2	9,235	
Plumas	366	-	-	-	-	366	-	-	366	-	-	366	
Yuba City	3,360	-	-	-	1,490	4,850	-	-	4,850	-	-	4,850	
<b>North Bay</b>													
Napa	2,903	60	-	-	9,075	12,038	-	-	12,038	-	-	12,038	
Solano	5,355	-	-	-	17,805	23,160	-	1,752	24,912	-	11,457	36,369	
<b>South Bay</b>													
Alameda-Zone 7	14,059	-	-	2,596	21,042	37,697	-	-	37,697	4,000	11,119	52,816	
Alameda County	4,241	-	-	50	15,349	19,640	-	-	19,640	4,000	88	23,728	
Santa Clara	9,353	-	-	10,749	16,261	36,363	-	-	36,363	45,000	3,260	84,623	
<b>San Joaquin Valley</b>													
Kings	1,437	1,414	-	1,000	591	4,442	-	-	4,442	-	203	4,645	
Dudley Ridge	-	6,113	-	5,412	9,815	21,340	-	-	21,340	3,365	5,241	29,946	
Empire	32	972	-	16	482	1,502	-	-	1,502	-	65	1,567	
Kern	236,482	11,504	-	37,005	73,303	358,294	-	-	358,294	164,925	90,987	614,206	
Oak Flat	583	-	-	7	2,200	2,790	-	-	2,790	-	30	2,820	
Tulare	12,074	15,729	-	8,400	4,169	40,372	-	-	40,372	-	7,989	48,361	
<b>Central Coastal</b>													
San Luis Obispo	1,178	-	-	-	2,503	3,681	-	-	3,681	-	-	3,681	
Santa Barbara	3,252	-	-	-	12,233	15,485	-	-	15,485	-	-	15,485	
<b>Southern California</b>													
AVEK	37,628	-	-	-	13,386	51,014	-	-	51,014	-	-	51,014	
Castaic Lake	20,143	13,177	-	-	28,434	61,754	-	-	61,754	-	-	61,754	
Coachella	48,423	-	-	164	-	48,587	-	-	48,587	-	17,952	66,539	
Crestline	1,368	-	-	-	2,000	3,368	-	-	3,368	-	-	3,368	
Desert	19,513	-	-	66	-	19,579	-	-	19,579	-	1,212	20,791	
Littlerock	-	-	-	-	-	-	-	-	-	-	-	-	
Metropolitan	613,271	6,592	-	32,267	106,288	758,418	-	-	758,418	103,260	10,209	871,887	
Mojave	4,598	20,696	-	-	2,852	28,146	-	-	28,146	-	-	28,146	
Palmdale	4,197	362	-	-	3,122	7,681	-	-	7,681	-	-	7,681	
San Bernardino	26,159	-	-	-	4,426	30,585	-	-	30,585	1,500	-	32,085	
San Gabriel	8,580	1,500	-	-	-	10,080	-	-	10,080	-	-	10,080	
San Geronimo	2,339	-	-	1,000	3,729	7,068	-	-	7,068	-	377	7,445	
Ventura	2,890	-	-	-	-	2,890	-	-	2,890	-	-	2,890	
<b>Total</b>	<b>1,084,692</b>	<b>86,444</b>	<b>-</b>	<b>98,732</b>	<b>350,555</b>	<b>1,620,423</b>	<b>-</b>	<b>1,752</b>	<b>1,622,175</b>	<b>326,050</b>	<b>160,191</b>	<b>2,108,416</b>	

<sup>a</sup> Please note that the water delivery figures listed are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to long-term water supply contract provisions. If your research requires more current data than was available at the time of publication, please consult the most recent publication of Bulletin 132 and/or contact DWR staff in the State Water Project Analysis Office.

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2013	
													Total Deliveries	
<b>FEATHER RIVER AREA</b>														
<i>SWP Agencies</i>														
City of Yuba City														
Table A	0	0	0	0	42	1,205	1,465	648	0	0	0	0	0	3,360
Carryover Water	0	0	0	0	0	0	0	568	78	536	257	51	1,490	1,490
Yuba Total	0	0	0	0	42	1,205	1,465	1,216	78	536	257	51	4,850	4,850
<i>County of Butte</i>														
Table A	11	5	7	35	30	21	210	250	205	45	55	34	908	908
Table A Transfer to Palmdale, Dudley Ridge, and Kern*	0	0	1,100	0	0	0	5,606	1,377	242	0	0	0	8,325	8,325
<i>Recreation/Fish and Wildlife (SWP)</i>														
Butte Recreation/Fish and Wildlife	0	0	0	0	1	0	0	1	0	0	0	0	2	2
Butte Total (*excluded from total)	11	5	7	35	31	21	210	251	205	45	55	34	910	910
<i>Plumas County Flood Control and Water Conservation District</i>														
Table A	0	0	0	0	31	114	55	55	78	33	0	0	366	366
Plumas Total	0	0	0	0	31	114	55	55	78	33	0	0	366	366
<i>Non-SWP Agencies</i>														
<i>Garden Highway Mutual Water Company</i>														
Regulated delivery of local supply	0	0	0	2,557	2,623	2,971	3,010	752	86	1,994	85	0	14,078	14,078
<i>Joint Water Districts Board</i>														
Regulated delivery of local supply	29,120	0	1,850	41,060	120,452	115,419	121,836	96,738	34,860	49,970	88,680	68,380	768,365	768,365
<i>Last Chance Creek Water District</i>														
Regulated delivery of local supply	0	0	0	0	2,277	2,380	0	1,319	123	188	48	0	6,335	6,335
<i>Oswald Water District</i>														
Regulated delivery of local supply	0	0	82	159	256	206	274	181	154	0	0	0	1,312	1,312
<i>Plumas Mutual Water Company</i>														
Regulated delivery of local supply	0	0	198	1,099	1,724	1,472	1,907	1,354	899	370	185	57	9,265	9,265
<i>South Feather Water and Power Agency</i>														
Regulated delivery of local supply	1	73	94	222	740	762	813	799	684	359	177	179	4,903	4,903
<i>Thermalito Water and Sewer District</i>														
Regulated delivery of local supply	82	68	101	144	240	269	302	275	254	202	121	115	2,173	2,173
<i>Tudor Mutual Water Company</i>														
Regulated delivery of local supply	0	0	78	315	591	511	788	485	391	64	0	0	3,223	3,223
<i>Western Canal Water District</i>														
Regulated delivery of local supply	8,777	0	0	14,418	61,076	52,525	63,673	41,087	7,890	38,819	41,876	26,061	356,202	356,202



**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	2013												Total Deliveries
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Valverde and Ramelli													
Regulated delivery of local supply	0	0	0	22	110	94	129	180	125	119	0	0	779
SWP													
	11	5	7	35	104	1,340	1,730	1,522	361	614	312	85	6,126
Non-SWP	37,980	141	2,403	59,996	190,089	176,609	192,732	143,170	45,466	92,085	131,172	94,792	1,166,635
<b>Feather River Area Total</b>	<b>37,991</b>	<b>146</b>	<b>2,410</b>	<b>60,031</b>	<b>190,193</b>	<b>177,949</b>	<b>194,462</b>	<b>144,692</b>	<b>45,827</b>	<b>92,699</b>	<b>131,484</b>	<b>94,877</b>	<b>1,172,761</b>
<b>NORTH BAY AREA</b>													
SWP Agencies													
Napa County Flood Control and Water Conservation District													
Table A	0	0	0	0	0	500	686	644	541	532	0	0	2,903
Table A Point of Delivery to Solano*	0	0	0	4	13	11	8	16	6	2	0	0	60
Carryover Water	916	913	443	1,215	1,667	987	0	0	0	491	1,254	1,189	9,075
Permit Water	0	0	0	0	0	0	200	200	100	0	0	0	500
Napa Total (*excluded from total)	916	913	443	1,215	1,667	1,487	886	844	641	1,023	1,254	1,189	12,478
Solano County Water Agency													
Table A	0	0	0	0	0	0	62	1,193	624	2,841	596	39	5,355
Table A Point of Delivery from Napa	0	0	0	4	13	11	8	16	6	2	0	0	60
Carryover Water	0	0	0	0	3,326	3,803	3,682	2,587	2,703	385	521	798	17,805
Settlement Water	0	190	169	918	475	0	0	0	0	0	0	0	1,752
Permit Water	0	12	0	111	726	1,047	1,545	1,711	1,517	1,583	1,372	1,333	10,957
Vallejo Permit to Napa*	0	0	0	0	0	0	200	200	100	0	0	0	500
Solano Total (*excluded from total)	0	202	169	1,033	4,540	4,861	5,297	5,507	4,850	4,811	2,489	2,170	35,929
SWP													
	916	1,103	612	2,137	5,481	5,301	4,438	4,440	3,874	4,251	2,371	2,026	36,950
Non-SWP Water	0	12	0	111	726	1,047	1,745	1,911	1,617	1,583	1,372	1,333	11,457
<b>North Bay Area Total</b>	<b>916</b>	<b>1,115</b>	<b>612</b>	<b>2,248</b>	<b>6,207</b>	<b>6,348</b>	<b>6,183</b>	<b>6,351</b>	<b>5,491</b>	<b>5,834</b>	<b>3,743</b>	<b>3,359</b>	<b>48,407</b>
<b>SOUTH BAY AREA</b>													
SWP Agencies													
Alameda County Flood Control and Water Conservation District, Zone 7													
Table A	0	0	444	230	1,289	1,597	2,035	1,801	1,921	567	873	1,236	11,993
Pool Program Water	0	0	0	0	0	0	1,000	1,200	396	0	0	0	2,596
Carryover Water	0	0	0	0	0	0	0	0	0	179	0	0	179
Water Bank Recovery	191	1,909	2,417	2,579	2,849	3,497	2,848	605	195	1,714	1,553	0	20,357

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	2013												Total Deliveries	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Local Water	0	0	0	0	0	0	0	0	0	402	0	0	0	402
Transfer from Byron Bethany ID	181	972	710	292	348	235	240	2,353	3,186	2,489	367	108	0	11,481
Dry Year Purchase Program	0	0	0	0	0	0	1,000	1,000	0	0	0	0	0	2,000
Alameda-Zone 7 Total	372	2,881	3,571	3,101	4,486	5,329	6,123	5,759	5,302	5,351	2,793	1,344	0	46,412
Alameda County Water District														
Table A	0	0	0	0	937	231	658	0	0	0	1,395	1,020	0	4,241
Pool Program Water	0	0	0	0	0	0	50	0	0	0	0	0	0	50
Carryover Water	1,184	1,473	1,751	1,981	493	1,222	778	1,324	2,433	2,474	236	0	0	15,349
Water Bank Recovery	0	0	0	0	1,000	1,000	1,000	1,000	0	0	0	0	0	4,000
Local Water	0	0	0	0	0	0	0	0	0	0	0	88	0	88
Alameda County Total	1,184	1,473	1,751	1,981	2,430	2,453	2,486	2,324	2,433	2,474	1,631	1,108	0	23,728
Santa Clara Valley Water District														
Table A	0	0	0	0	0	0	0	0	0	0	4,938	4,415	0	9,353
Pool Program Water	0	0	0	0	0	0	0	857	2,215	7,637	40	0	0	10,749
Carryover Water	2,213	4,211	3,953	3,110	2,200	0	0	0	0	0	574	0	0	16,261
Water Bank Recovery	0	0	0	4,000	4,221	7,377	9,774	8,996	7,308	1,255	2,069	0	0	45,000
Transfer From Browns Valley ID	0	0	0	0	0	0	1,085	0	0	0	0	0	0	1,085
Dry Year Purchase Program	0	0	0	0	0	0	0	1,000	1,175	0	0	0	0	2,175
Santa Clara Total	2,213	4,211	3,953	7,110	6,421	7,377	10,859	10,853	10,698	8,892	7,621	4,415	0	84,623
<i>Non-SWP Agencies</i>														
Byron Bethany Irrigation District														
Regulated delivery of local supply	49	426	2,221	2,617	4,246	3,909	4,010	3,881	2,726	1,632	359	125	0	26,201
Recreation/Fish and Wildlife (SWP)														
Lake del Valle	2	3	12	11	10	14	25	22	22	10	4	2	0	137
SWP	4,681	7,272	8,750	13,611	14,602	15,191	16,968	16,652	14,033	14,955	12,594	7,528	0	146,837
Non-SWP	196	694	2,937	2,745	4,429	4,513	6,919	6,288	7,206	3,167	745	829	0	40,668
<b>South Bay Area Total</b>	<b>4,877</b>	<b>7,966</b>	<b>11,687</b>	<b>16,356</b>	<b>19,031</b>	<b>19,704</b>	<b>23,887</b>	<b>22,940</b>	<b>21,239</b>	<b>18,122</b>	<b>13,339</b>	<b>8,357</b>	<b>0</b>	<b>187,505</b>
<b>SAN JOAQUIN VALLEY AREA</b>														
<i>SWP Agencies</i>														
County of Kings														
Table A	0	0	0	2	0	1,328	0	107	0	0	0	0	0	1,437
Table A Point of Delivery to Westlands*	0	0	0	0	296	347	0	0	232	242	142	155	0	1,414
Pool Program Water	0	0	0	0	0	5	634	321	34	0	0	0	0	994

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2013 Total Deliveries
Pool Program Water to Westlands*	0	0	0	0	6	0	0	0	0	0	0	0	6
Carryover Water to Westlands*	72	92	142	241	34	0	0	2	2	0	3	3	591
Dry Purchase Program	0	0	0	0	0	0	84	7	0	0	0	0	91
Dry Year Purchase Program to Westlands*	0	0	0	0	0	0	112	0	0	0	0	0	112
Kings Total (*excluded from total)	0	0	0	2	0	1,333	830	435	34	0	0	0	2,634
Dudley Ridge Water District													
Table A Received through Transfer	0	0	0	0	0	2,549	4,500	1,050	0	0	0	0	8,099
Table A Transferred to Kern and Westlands*	0	0	0	0	0	0	4,941	0	0	0	500	0	5,441
Table A from Butte	0	0	0	0	0	0	243	242	242	0	0	0	727
Table A Exchange from Kern	0	0	0	0	291	291	292	0	0	0	0	0	874
Table A Exchange to San Gabriel*	672	0	0	0	0	0	0	0	0	0	0	0	672
Table A Exchange from San Gabriel	0	0	0	1,000	500	0	0	0	0	0	0	0	1,500
Pool Program Water	0	0	0	0	0	0	60	2,942	1,501	909	0	0	5,412
Carryover Water	131	660	512	66	2,434	1,437	11	0	59	1,156	259	0	6,725
Carryover Water to Kern*	0	0	0	0	0	0	2,000	0	0	0	0	0	2,000
Carryover Water to Santa Barbara*	0	0	0	0	0	0	0	1,090	0	0	0	0	1,090
Water Bank Recovery to Kern*	0	0	0	0	0	2,365	1,000	0	0	0	0	0	3,365
Yuba Transfer Program	0	0	0	0	0	0	1,070	1,077	914	0	0	0	3,061
Dry Year Purchase Program	0	0	0	0	0	0	352	351	392	0	0	0	1,095
General Conveyance Program	0	0	0	0	0	0	362	362	361	0	0	0	1,085
Dudley Ridge Total (*excluded from total)	131	660	512	1,066	3,225	4,277	6,890	6,024	3,469	2,065	259	0	28,578
Empire West Side Irrigation District													
Table A	0	0	32	0	0	0	0	0	0	0	0	0	32
Table A Transfer to Westlands*	0	0	0	0	280	441	251	0	0	0	0	0	972
Pool Program Water	0	0	0	0	0	0	0	16	0	0	0	0	16
Carryover Water	367	8	107	0	0	0	0	0	0	0	0	0	482
Dry Year Purchase Program	0	0	0	0	0	0	0	65	0	0	0	0	65
Empire Total (*excluded from total)	367	8	139	0	0	0	0	81	0	0	0	0	595
Kern County Water Agency													
Table A	0	2,637	0	17,944	37,714	42,958	76,373	13,533	12,903	32,420	0	0	236,482
Table A Point of Delivery to Western Hills*	30	31	60	61	135	157	173	163	135	95	88	28	1,156
Table A from Metropolitan	0	0	0	198	920	14	1,294	2,980	1,186	0	0	0	6,592
Table A Transfer to Dudley Ridge	0	0	0	0	0	0	4,941	0	0	0	0	0	4,941
Table A Transfer to Westlands*	0	0	0	0	0	0	8,393	0	0	0	0	0	8,393
Table A Transfer from Butte	0	0	0	0	0	0	4,342	0	0	0	0	0	4,342

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2013 Total Deliveries
Table A Exchange from Castaic Lake	0	0	0	0	0	0	1,677	5,500	0	0	0	0	7,177
Table A Exchange to Dudley Ridge*	0	0	0	0	291	291	292	0	0	0	0	0	874
Table A Exchange to Santa Barbara*	0	0	0	277	0	0	0	804	0	0	0	0	1,081
Pool Program Water	0	0	0	0	0	0	0	20,000	15,840	0	1,165	0	37,005
Carryover Water	0	0	0	0	16,365	56,938	0	0	0	0	0	0	73,303
Carryover Water from Dudley Ridge and Castaic Lake	0	0	0	0	0	0	5,823	0	0	0	0	0	5,823
Water Bank Recovery	13,396	20,482	24,132	28,792	21,856	15,368	9,296	8,712	0	5,263	8,456	9,172	164,925
Water Bank Recovery to Other SWP Agencies*	0	6,728	5,299	4,940	6,649	10,262	14,086	17,169	15,087	25,266	30,673	8,725	144,884
Water Bank Recovery from Dudley Ridge	0	0	0	0	0	2,365	1,000	0	0	0	0	0	3,365
Transfer Program Water	0	0	0	0	0	0	20,737	31,797	9,577	0	0	0	62,111
Dry Year Purchase Program	0	0	0	0	0	0	7,125	7,125	7,124	0	0	0	21,374
Water delivered to Cross Valley Canal	0	0	0	0	0	0	0	0	800	0	0	0	800
General Conveyance Program	0	0	0	0	0	0	700	1,900	4,060	0	0	0	6,660
General Conveyance Program*	0	0	0	0	0	0	4,354	5,146	7,000	0	0	0	16,500
Operation Exchange Program	0	0	0	842	0	0	0	0	0	0	0	0	842
Kern Total (*excluded from total)	13,396	23,119	24,132	47,776	76,855	112,457	133,308	91,547	50,690	37,683	9,621	9,172	629,756
Oak Flat Water District													
Table A	0	0	0	0	0	0	228	0	188	133	33	1	583
Pool Program Water	0	0	0	0	0	0	7	0	0	0	0	0	7
Carryover Water	2	88	227	211	413	491	292	426	50	0	0	0	2,200
Dry Year Purchase Program	0	0	0	0	0	0	30	0	0	0	0	0	30
Oak Flat Total	2	88	227	211	413	491	557	426	238	133	33	1	2,820
Tulare Lake Basin Water Storage District													
Table A	0	24	0	40	0	3,274	0	7,642	347	349	0	398	12,074
Table A Transfer to Westlands and Dudley Ridge*	0	0	0	2,000	1,100	4,299	6,780	1,550	0	0	0	0	15,729
Pool Program Water	0	0	0	0	0	105	7,588	707	0	0	0	0	8,400
Carryover Water	60	97	486	817	343	2,366	0	0	0	0	0	0	4,169
Dry Year Purchase Program	0	0	0	0	0	0	1,935	0	0	0	0	0	1,935
General Conveyance Program	0	1,054	0	0	0	600	4,400	0	0	0	0	0	6,054
Tulare Total (*excluded from total)	60	1,175	486	857	343	6,345	13,923	8,349	347	349	0	398	32,632

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	2013												Total Deliveries		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Recreation/Fish and Wildlife (SWP)															
Department of Parks and Recreation, Cattle	1	1	1	1	0	0	0	0	0	0	0	0	0	0	4
Department of Fish and Wildlife, O'Neill	22	49	75	41	49	59	59	91	45	90	32	50	662		
Department of Fish and Wildlife, Lateral 4	0	0	0	1	0	31	2	0	1	0	0	0	35		
Department of Parks and Recreation, O'Neill	0	0	0	0	1	0	1	0	1	0	0	0	3		
Department of Parks and Recreation, San Luis	0	0	0	0	1	0	1	0	0	0	1	0	3		
Recreation/Fish and Wildlife (SWP) Total	23	50	76	43	51	90	63	91	47	90	33	50	707		
Non-SWP Agencies															
County of Fresno	0	0	0	0	0	0	49	153	398	0	0	0	600		
County of Tulare	0	0	0	0	0	0	84	268	710	0	0	0	1,062		
Hills Valley Irrigation District	0	0	0	0	0	0	56	182	392	0	0	0	630		
Kern-Tulare Water District	0	0	0	0	0	0	847	1,089	0	2,064	0	0	4,000		
Lower Tule River Irrigation District	0	0	0	0	0	0	500	1,589	4,131	0	0	0	6,220		
Pixley Irrigation District	0	0	0	0	0	0	501	1,588	4,131	0	0	0	6,220		
Non-SWP Agencies Total	24	33	43	53	95	90	2,136	4,957	9,840	2,159	56	9	19,495		
CVP Annual Contractors															
Musco Family Olive Company	21	29	36	40	63	53	57	50	46	74	45	2	516		
San Joaquin Valley National Cemetery	3	4	7	13	32	37	42	38	32	21	11	7	247		
San Luis Water District	0	0	0	0	0	0	0	3,000	3,000	0	0	0	6,000		
CVP Annual Contractors Total	24	33	43	53	95	90	99	3,088	3,078	95	56	9	6,763		
Western Hills Water District															
Table A Point of Delivery from SWP	30	31	60	61	135	157	173	163	135	95	88	28	1,156		
Western Hills Total	30	31	60	61	135	157	173	163	135	95	88	28	1,156		
Westlands Water District															
Table A Point of Delivery from Kings	0	0	0	0	296	347	0	0	232	242	142	155	1,414		
Table A Transfer from Dudley Ridge, Tulare, Empire, and Kern	0	0	0	2,000	1,380	2,191	10,924	500	0	0	500	0	17,495		
Pool Program from Kings	0	0	0	0	6	0	0	0	0	0	0	0	6		
Carryover Water	72	92	142	241	34	0	0	2	2	0	3	3	591		
Transfer Program Water from Merced Irrigation District	0	0	0	0	0	0	4,686	5,023	18,157	0	0	0	27,866		
Dry Year Purchase Program	0	0	0	0	0	0	112	0	0	0	0	0	112		
Water delivered to Cross Valley Canal	0	0	0	0	0	0	847	1,089	0	2,064	0	0	4,000		
Westlands Total	72	92	142	2,241	1,716	2,538	15,610	5,525	18,391	242	645	158	47,372		



**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	2013												Total Deliveries
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Bureau of Reclamation													
Kern National Wildlife Refuge	1,585	1,609	0	0	400	0	0	0	3,575	5,128	3,337	3,112	18,746
Fish and Wildlife Recreation	40	14	22	5	45	96	57	52	51	3	0	27	412
Reclamation Total	1,766	1,712	292	184	761	4,252	412	20,003	13,922	5,362	3,922	3,601	56,150
SWP													
	14,081	24,169	25,774	51,415	82,738	127,088	129,761	67,934	35,766	40,657	10,679	9,807	619,869
Non-SWP	2,728	1,750	104	1,100	986	766	44,205	55,691	54,878	5,871	3,369	1,176	172,624
<b>San Joaquin Valley Area Total</b>	<b>16,809</b>	<b>25,919</b>	<b>25,878</b>	<b>52,515</b>	<b>83,724</b>	<b>127,854</b>	<b>173,966</b>	<b>123,625</b>	<b>90,644</b>	<b>46,528</b>	<b>14,048</b>	<b>10,983</b>	<b>792,493</b>
<b>CENTRAL COASTAL AREA</b>													
SWP Agencies													
San Luis Obispo County Flood Control and Water Conservation District													
Table A	0	0	0	0	0	0	0	317	267	244	34	316	1,178
Carryover Water	331	289	446	348	379	366	344	0	0	0	0	0	2,503
San Luis Obispo Total	331	289	446	348	379	366	344	317	267	244	34	316	3,681
Santa Barbara County Flood Control and Water Conservation District													
Table A	0	0	0	0	0	0	0	0	617	1,858	191	586	3,252
Table A Exchange from Palmdale and Kern	0	0	0	277	0	0	0	1,129	0	37	0	0	1,443
Carryover Water	929	883	1,338	1,042	1,700	1,887	1,954	311	1,864	325	0	0	12,233
Carryover Water from Dudley Ridge	0	0	0	0	0	0	0	1,090	0	0	0	0	1,090
Santa Barbara Total	929	883	1,338	1,319	1,700	1,887	1,954	2,530	2,481	2,220	191	586	18,018
SWP													
	1,260	1,172	1,784	1,667	2,079	2,253	2,298	2,847	2,748	2,464	225	902	21,699
Non-SWP	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Central Coastal Area Total</b>	<b>1,260</b>	<b>1,172</b>	<b>1,784</b>	<b>1,667</b>	<b>2,079</b>	<b>2,253</b>	<b>2,298</b>	<b>2,847</b>	<b>2,748</b>	<b>2,464</b>	<b>225</b>	<b>902</b>	<b>21,699</b>
<b>SOUTHERN CALIFORNIA AREA</b>													
SWP Agencies													
Antelope Valley-East Kern Water Agency													
Table A	1,148	1,380	428	536	13	6,287	6,902	6,484	5,758	4,132	2,605	1,955	37,628
Table A Point of Delivery from Mojave	0	0	0	0	0	0	0	0	0	0	0	33	33
Carryover Water	1,304	806	2,496	2,979	5,801	0	0	0	0	0	0	0	13,386
Carryover Water from Palmdale	0	0	0	1	1	2	1	1	1	0	1	0	8
AVEK Total	2,452	2,186	2,924	3,516	5,815	6,289	6,903	6,485	5,759	4,132	2,606	1,988	51,055

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2013 Total Deliveries
Castaic Lake Water Agency													
Table A	530	545	197	2,188	1,849	2,157	2,276	2,464	1,946	2,406	2,188	1,397	20,143
Table A Transfer to San Luis Water District*	0	0	0	0	0	0	0	3,000	3,000	0	0	0	6,000
Table A Exchange to Kern*	0	0	0	0	0	0	1,677	5,500	0	0	0	0	7,177
Carryover Water	900	1,309	2,441	1,174	2,500	2,732	2,946	3,072	3,260	1,800	1,177	1,300	24,611
Carryover Water to Kern*	0	0	0	0	0	0	3,823	0	0	0	0	0	3,823
Castaic Lake Total (*excluded from total)	1,430	1,854	2,638	3,362	4,349	4,889	5,222	5,536	5,206	4,206	3,365	2,697	44,754
Coachella Valley Water District													
Table A	0	0	0	0	0	0	0	0	9,874	15,219	15,382	7,948	48,423
Pool Program Water	0	0	0	0	0	0	164	0	0	0	0	0	164
Dry Year Purchase Program	0	0	0	0	0	0	1,452	0	0	0	0	0	1,452
General Conveyance Program	0	0	0	0	0	0	4,354	5,146	7,000	0	0	0	16,500
Coachella Total	0	0	0	0	0	0	5,970	5,146	16,874	15,219	15,382	7,948	66,539
Crestline-Lake Arrowhead Water Agency													
Table A	102	43	76	85	128	139	163	189	148	110	82	103	1,368
Carryover Water to San Gorgonio	0	0	0	0	0	0	0	0	0	994	1,006	0	2,000
Crestline Total	102	43	76	85	128	139	163	189	148	110	82	103	1,368
Desert Water Agency													
Table A	0	0	0	0	0	0	0	0	1,968	6,133	6,133	5,279	19,513
Pool Program Water	0	0	0	0	0	0	66	0	0	0	0	0	66
Dry Year Purchase Program	0	0	0	0	0	0	1,212	0	0	0	0	0	1,212
Desert Total	0	0	0	0	0	0	1,278	0	1,968	6,133	6,133	5,279	20,791
The Metropolitan Water District of Southern California													
Table A	0	39,629	67,419	84,661	80,829	78,359	55,380	50,719	37,247	51,758	29,422	37,848	613,271
Table A Point of Delivery to Kern*	0	0	0	198	920	14	1,294	2,980	1,186	0	0	0	6,592
Table A Exchange from Mojave	0	0	0	0	0	2,957	2,957	2,957	2,957	2,957	2,957	2,921	20,663
Pool Program Water	0	0	0	0	0	0	12,267	10,000	10,000	0	0	0	32,267
Carryover Water	75,791	25,009	5,488	0	0	0	0	0	0	0	0	0	106,288
Water Bank Recovery	10,092	9,512	5,299	940	428	885	2,312	6,173	6,279	24,011	28,604	8,725	103,260
Dry Year Purchase Program	0	0	0	0	0	0	3,666	3,666	2,877	0	0	0	10,209
Metropolitan Total (*excluded from total)	85,883	74,150	78,206	85,601	81,257	82,201	76,582	73,515	59,360	78,726	60,983	49,494	885,958

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	2013												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Deliveries
Mojave Water Agency													
Table A	0	0	0	0	549	731	606	473	534	1,214	460	31	4,598
Table A Point of Delivery to AVEK*	0	0	0	0	0	0	0	0	0	0	0	33	33
Table A Exchanged to Metropolitan	0	0	0	0	0	2,957	2,957	2,957	2,957	2,957	2,957	2,921	20,663
Carryover Water	696	718	659	779	0	0	0	0	0	0	0	0	2,852
Mojave Total (*excluded from total)	696	718	659	779	549	731	606	473	534	1,214	460	31	7,450
Palmdale Water District													
Table A	0	680	0	0	0	749	167	486	331	0	713	1,071	4,197
Table A from Butte	0	0	1,100	0	0	0	1,021	1,135	0	0	0	0	3,256
Table A Exchange to Santa Barbara*	0	0	0	0	0	0	0	325	0	37	0	0	362
Carryover Water	544	0	0	1,297	1,273	0	0	0	0	0	0	0	3,114
Carryover Water to another SWP contractor*	0	0	0	1	1	2	1	1	1	0	1	0	8
Palmdale Total (*excluded from total)	544	680	1,100	1,297	1,273	749	1,188	1,621	331	0	713	1,071	10,567
San Bernardino Valley Municipal Water District													
Table A	1,509	1,358	0	2,270	4,706	3,205	4,319	2,821	1,246	2,208	1,765	752	26,159
Carryover Water	2,000	300	1,574	552	0	0	0	0	0	0	0	0	4,426
Water Bank Recovery	0	0	0	0	0	0	0	0	1,500	0	0	0	1,500
San Bernardino Total	3,509	1,658	1,574	2,822	4,706	3,205	4,319	2,821	2,746	2,208	1,765	752	32,085
San Gabriel Valley Municipal Water District													
Table A	1,443	0	0	0	2,434	2,385	2,318	0	0	0	0	0	8,580
Table A to Dudley Ridge	0	0	0	1,000	500	0	0	0	0	0	0	0	1,500
Table A Exchange from Dudley Ridge	672	0	0	0	0	0	0	0	0	0	0	0	672
San Gabriel Total	2,115	0	0	0	2,434	2,385	2,318	0	0	0	0	0	9,252
San Geronio Pass Water Agency													
Table A	0	0	0	321	501	452	471	117	458	0	0	19	2,339
Pool Program Water	0	0	0	0	0	0	0	500	0	0	0	500	1,000
Carryover Water	692	33	0	500	500	500	500	0	500	0	4	500	3,729
Carryover Water from Crestline	0	0	0	0	0	0	0	0	0	994	1,006	0	2,000
Dry Year Purchase Program	0	0	0	0	0	0	0	377	0	0	0	0	377
San Geronio Total	692	33	0	821	1,001	952	971	994	958	994	1,010	1,019	9,445
Ventura County Watershed Protection District													
Table A	0	0	0	0	0	0	0	0	36	204	2,446	204	2,890
Ventura Total	0	0	0	0	0	0	0	0	36	204	2,446	204	2,890

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	2013												Total Deliveries
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Recreation/Fish and Wildlife (SWP)													
Castaic Lagoon	3	0	12	15	16	24	24	31	12	34	15	10	196
Lake Perris - Parks and Recreation	6	5	11	19	28	36	43	20	24	23	7	8	230
Lake Perris- Fish and Wildlife	13	13	30	30	9	20	15	2	10	20	12	12	186
Pyramid Lake	2	1	4	11	9	12	18	8	16	6	9	2	98
Silverwood Lake	2	3	3	6	10	14	16	11	9	7	2	2	85
Recreation/Fish and Wildlife (SWP) Total	26	22	60	81	72	106	116	72	71	90	45	34	795
SWP	97,449	81,344	87,237	98,364	101,584	101,646	94,952	87,663	84,114	113,236	94,990	70,620	1,113,199
Non-SWP	0	0	0	0	0	0	10,684	9,189	9,877	0	0	0	29,750
<b>Southern California Area Total</b>	<b>97,449</b>	<b>81,344</b>	<b>87,237</b>	<b>98,364</b>	<b>101,584</b>	<b>101,646</b>	<b>105,636</b>	<b>96,852</b>	<b>93,991</b>	<b>113,236</b>	<b>94,990</b>	<b>70,620</b>	<b>1,142,949</b>
<b>SWP WATER</b>													
SWP Long-term Water Supply Contracts													
Table A	5,088	46,763	69,098	111,486	131,637	145,661	153,679	89,369	76,159	122,565	69,627	63,560	1,084,692
Transfer Table A	30	31	1,160	2,263	2,744	5,269	27,446	9,086	4,801	339	730	216	54,115
Exchange Table A	672	0	0	1,277	791	3,248	4,926	9,586	2,957	2,994	2,957	2,921	32,329
Pool Water	0	0	0	0	6	110	21,836	36,543	29,986	8,546	1,205	500	98,732
Carryover Water	89,069	38,012	24,158	17,418	42,296	75,512	17,674	10,407	11,766	11,014	7,441	5,788	350,555
Total Table A	94,859	84,806	94,416	132,444	177,474	229,800	225,561	154,991	125,669	145,458	81,960	72,985	1,620,423
Other Water Supply Contracts													
Water Bank Recovery	23,488	29,994	29,431	33,732	28,505	27,995	24,382	25,881	15,087	30,529	39,129	17,897	326,050
Solano Settlement	0	190	169	918	475	0	0	0	0	0	0	0	1,752
<b>SWP Total</b>	<b>118,347</b>	<b>114,990</b>	<b>124,016</b>	<b>167,094</b>	<b>206,454</b>	<b>257,795</b>	<b>249,943</b>	<b>180,872</b>	<b>140,756</b>	<b>175,987</b>	<b>121,089</b>	<b>90,882</b>	<b>1,948,225</b>
<b>NON-SWP WATER</b>													
Non-SWP Water to SWP Contractors													
Recreation/Fish and Wildlife	0	0	0	0	1	0	0	1	0	0	0	0	2
Yuba Accord Dry Year Purchase Program	0	0	0	0	0	0	15,968	12,897	11,968	215	0	0	41,048
Local Water	147	268	716	128	183	604	750	273	2,569	1,320	386	704	8,048
Other temporary transfer programs	0	0	0	0	0	0	22,881	33,702	10,827	0	0	0	67,410
General Conveyance	0	1,054	0	0	0	600	9,816	7,408	11,421	0	0	0	30,299
Water Transfer	0	0	0	0	0	0	1,085	0	0	0	0	0	1,085
Water Operations Exchange	0	0	0	842	0	0	0	0	0	0	0	0	842
Vallejo Permit	0	12	0	111	726	1,047	1,745	1,911	1,617	1,583	1,372	1,333	11,457

**Table 9-9 Total Amounts of Water Delivered in 2013, by Month (acre-feet)**

Contracting Agency and Type of Service	2013												Total Deliveries
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
<i>Subtotal</i>	147	1,334	716	1,081	910	2,251	52,245	56,192	38,402	3,118	1,758	2,037	160,191
<b>Total Deliveries to SWP Contractors</b>	<b>118,494</b>	<b>116,324</b>	<b>124,732</b>	<b>168,175</b>	<b>207,364</b>	<b>260,046</b>	<b>302,188</b>	<b>237,064</b>	<b>179,158</b>	<b>179,105</b>	<b>122,847</b>	<b>92,919</b>	<b>2,108,416</b>
<b>Non-SWP Water Supply Contracts</b>													
Local	38,029	567	4,624	62,613	194,335	180,518	196,742	147,051	48,192	93,717	131,531	94,917	1,192,836
Recreation/Fish and Wildlife	51	75	148	135	133	210	204	185	140	190	82	86	1,639
CVP/Reclamation													
Transfer from Merced Irrigation District	0	0	0	0	0	0	4,686	5,023	18,157	0	0	0	27,866
Cross Valley Canal Contractors	0	0	0	0	0	0	2,037	4,869	9,762	2,064	0	0	18,732
Kern National Wildlife Refuge	2,685	622	0	171	850	0	426	2,953	4,417	3,638	3,288	1,126	20,176
Recreation/Fish and Wildlife	19	41	61	34	41	76	50	74	36	74	25	41	572
Annual Contract	24	33	43	53	95	90	99	88	78	95	56	9	763
<b>Non-SWP Water Supply Contracts Total</b>	<b>40,808</b>	<b>1,338</b>	<b>4,876</b>	<b>63,006</b>	<b>195,454</b>	<b>180,894</b>	<b>204,244</b>	<b>160,243</b>	<b>80,782</b>	<b>99,778</b>	<b>134,982</b>	<b>96,179</b>	<b>1,262,584</b>
<b>Grand Total</b>	<b>159,302</b>	<b>117,662</b>	<b>129,608</b>	<b>231,181</b>	<b>402,818</b>	<b>440,940</b>	<b>506,432</b>	<b>397,307</b>	<b>259,940</b>	<b>278,883</b>	<b>257,829</b>	<b>189,098</b>	<b>3,371,000</b>



**Table 9-10 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2013 (acre-feet)**

Year	Annual Table A Amounts According to Long-term Water Supply Contracts							Water Conveyed							Total [16]	
	Deliveries							Deliveries								
	Upper Feather River Area [1]	North Bay Area [2]	South Bay Area [3]	San Joaquin Valley Area [4]	Central Coastal Area [5]	Southern California Area [6]	Total [7]	Table A Water [8]	Article 21, Surplus, and Unscheduled Water [9]	Other Water <sup>b</sup> [10]	Feather River Diversions <sup>c</sup> [11]	Recreation/ Fish and Wildlife/ Water [12]	Subtotal [13]	Initial Fill Water [14]		Losses and Storage Changes <sup>d</sup> [15]
1962	-	-	-	-	-	-	-	-	-	9,704	7,499	-	17,203	9	272	17,484
1963	-	-	-	-	-	-	-	-	-	13,212	16,049	-	29,261	71	185	29,517
1964	-	-	-	-	-	-	-	-	-	21,743	17,891	-	39,634	171	152	39,957
1965	-	-	-	-	-	-	-	-	-	35,985	27,425	-	63,410	93	729	64,232
1966	-	-	-	-	-	-	-	-	-	59,599	33,361	-	92,960	-	1,746	94,706
1967	-	-	11,538	-	-	-	11,538	11,354	-	45,225	24,639	-	81,218	8,328	4,212	93,758
1968	550	-	109,900	77,350	-	3,700	191,500	171,709	121,534	1,214	903,367	-	1,197,824	488,926	117,906	1,814,656
1969	620	-	98,700	163,075	-	5,000	267,395	193,020	72,397	8,692	832,454	-	1,106,563	510,614	72,196	1,689,373
1970	700	-	114,200	202,000	-	5,700	322,600	233,993	131,848	25,401	804,320	-	1,195,562	23,947	2,435	1,221,944
1971	890	-	116,200	251,800	-	6,700	375,590	357,340	294,581	35,438	825,886	8	1,513,253	7,853	5,812	1,526,918
1972	970	-	118,300	413,066	-	209,423	741,759	611,801	422,322	53,848	875,529	6,489	1,969,989	100,274	53,062	2,123,325
1973	1,100	-	120,400	383,652	-	481,100	986,252	692,888	294,916	29,540	851,285	1,155	1,869,794	204,638	53,798	2,128,220
1974	1,230	-	122,400	460,650	-	597,920	1,182,200	874,075	412,453	31,493	963,956	2,118	2,284,095	237,554	10,657	2,532,306
1975	1,610	-	124,500	545,809	-	714,950	1,386,869	1,223,990	620,685	46,995	924,696	3,377	2,819,743	103,352	(94,606)	2,828,489
1976	1,990	-	126,500	543,417	-	836,480	1,508,387	1,373,002	551,685	103,546	1,018,653	1,745	3,048,631	61,122	(681,025)	2,428,728
1977	2,420	-	128,600	581,400	-	954,901	1,667,321	573,896	-	410,991	624,497	1,111	1,610,495	-	(131,151)	1,479,344
1978	1,850	-	130,700	635,900	-	1,049,584	1,816,034	1,312,365	16,215	177,245	836,864	1,691	2,344,380	64,443	717,370	3,126,193
1979	2,130	-	132,700	702,685	-	1,190,573	2,028,088	1,404,292	646,830	431,693	933,067	1,766	3,417,648	12,302	(83,430)	3,346,520
1980	1,810	500	134,800	758,100	1,946	1,317,614	2,214,770	1,511,491	402,217	40,269	925,750	2,131	2,881,858	-	(26,606)	2,855,252
1981	1,940	650	137,000	818,000	2,813	1,432,065	2,392,468	1,889,125	908,428	283,310	993,785	4,688	4,079,336	-	(802,263)	3,277,073
1982	1,970	800	139,200	876,500	5,626	1,550,449	2,574,545	1,738,056	215,134	144,267	819,586	4,646	2,921,689	-	480,752	3,402,441
1983	2,000	950	141,400	867,118	8,439	1,681,257	2,701,164	1,184,119	13,019	172,030	633,778	7,849	2,010,795	-	(90,997)	1,919,798
1984	3,630	1,100	143,600	979,211	12,698	1,744,098	2,884,337	1,587,593	262,917	366,273	891,128	7,040	3,114,951	-	(140,182)	2,974,769
1985	3,760	1,250	145,800	1,019,049	21,138	1,864,849	3,055,846	1,912,765	301,844	474,417	924,049	4,033	3,617,108	-	92,885	3,709,993
1986	4,190	1,400	148,100	1,091,946	28,210	1,983,890	3,257,736	2,007,906	24,350	177,176	843,040	3,865	3,056,337	-	284,380	3,340,717
1987	4,620	1,550	150,300	1,188,500	35,204	2,103,941	3,484,115	2,113,915	114,907	375,810	882,301	7,672	3,494,605	-	(390,413)	3,104,192
1988	5,060	15,471	152,500	1,246,100	43,722	2,225,482	3,688,335	2,376,373	-	520,375	884,877	4,889	3,786,514	-	(92,850)	3,693,664
1989	5,500	24,615	156,700	1,290,400	56,342	2,424,633	3,958,190	2,853,747	-	474,559	830,500	8,135	4,166,941	-	447,917	4,614,858
1990	6,040	28,190	160,900	1,313,450	70,486	2,500,600	4,079,666	2,582,151	90	424,697	875,099	9,262	3,891,299	-	(528,869)	3,362,430
1991	11,880	29,590	166,400	1,338,011	70,486	2,510,200	4,126,567	549,113	3,521	543,582	565,395	4,879	1,666,490	-	167,435	1,833,925

**Table 9-10 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2013 (acre-feet)**

(continued)

Year	Annual Table A Amounts According to Long-term Water Supply Contracts										Water Conveyed						Total [16]
	Deliveries										Deliveries						
	Upper Feather River Area [1]	North Bay Area [2]	South Bay Area [3]	San Joaquin Valley Area [4]	Central Coastal Area [5]	Southern California [6]	Total Area [7]	Table A Water [8]	Article 21, Surplus, and Unscheduled Water <sup>a</sup> [9]	Other Water <sup>b</sup> [10]	Feather River Diversion <sup>c</sup> [11]	Recreation/ Fish and Wildlife Water [12]	Subtotal [13]	Initial Fill Water [14]	Losses and Storage Changes <sup>d</sup> [15]		
1992	11,920	32,010	171,900	1,342,300	70,486	2,510,200	4,138,816	1,410,799	1,156	166,992	613,978	2,605	2,195,530	-	(63,541)	2,131,989	
1993	11,960	34,620	177,400	1,342,300	70,486	2,510,200	4,146,966	2,313,236	-	256,853	822,589	2,609	3,395,287	-	726,123	4,121,410	
1994	12,000	37,215	182,000	1,342,300	70,486	2,510,200	4,154,201	1,749,351	112,625	236,739	874,018	8,200	2,980,933	-	(295,405)	2,685,528	
1995	12,050	44,030	184,000	1,342,300	70,486	2,510,200	4,163,066	1,967,093	64,330	85,560	860,077	2,575	2,979,635	-	69,536	3,049,171	
1996	12,100	48,225	186,000	1,301,630	70,486	2,492,900	4,111,341	2,514,824	28,647	252,346	1,005,148	3,907	3,804,872	86	491,550	4,296,508	
1997	12,150	49,315	188,000	1,297,300	45,201	2,492,900	4,084,866	2,260,383	21,432	322,000	993,211	4,146	3,601,172	527	(11,806)	3,589,893	
1998	12,200	50,420	188,000	1,272,300	45,201	2,517,900	4,086,021	1,726,519	20,288	127,405	872,738	2,108	2,749,058	-	(132,491)	2,616,567	
1999	13,940	55,020	188,000	1,272,300	70,486	2,519,900	4,119,646	2,738,903	158,070	85,312	1,108,672	4,324	4,095,281	-	(189,525)	3,905,756	
2000	14,000	55,945	210,000	1,205,300	70,486	2,565,900	4,121,631	3,168,936	308,785	342,688	1,085,886	4,096	4,910,391	-	(20,103)	4,890,288	
2001	14,670	66,561	220,000	1,185,519	70,486	2,566,900	4,124,136	1,579,291	48,145	524,768	1,077,997	2,942	3,233,143	-	159,983	3,393,126	
2002	14,730	67,396	220,000	1,182,519	70,486	2,569,900	4,125,031	2,565,630	43,115	241,268	1,131,880	3,712	3,985,605	-	80,709	4,066,314	
2003	14,790	68,231	220,400	1,182,119	70,486	2,570,900	4,126,926	2,943,242	59,828	249,884	1,006,995	2,862	4,262,811	-	459,377	4,722,188	
2004	13,100	69,056	222,619	1,170,000	70,486	2,581,800	4,127,061	2,594,726	218,496	453,603	1,171,835	2,887	4,441,547	-	108,840	4,550,387	
2005	10,800	69,481	222,619	1,170,000	70,486	2,582,300	4,125,686	2,827,256	731,083	92,858	1,074,706	1,515	4,727,418	-	529,347	5,256,765	
2006	11,124	69,856	222,619	1,170,000	70,486	2,582,800	4,126,885	2,973,349	621,339	143,774	1,094,944	3,628	4,837,034	-	(119,981)	4,717,053	
2007	11,520	70,231	222,619	1,170,000	70,486	2,584,450	4,129,306	2,080,897	309,973	713,993	1,193,237	2,581	4,300,681	-	(524,851)	3,775,830	
2008	39,120	70,606	222,619	1,170,000	70,486	2,593,100	4,165,931	1,238,159	2,729	842,893	1,087,669	2,778	3,174,228	-	(758,813)	2,415,415	
2009	39,190	70,981	222,619	1,170,000	70,486	2,593,100	4,166,376	1,232,753	6,032	798,348	1,125,147	2,047	3,164,327	97	(31,319)	3,133,105	
2010	39,260	76,531	222,619	1,140,000	70,486	2,623,100	4,171,996	1,930,929	7,505	778,035	978,172	1,167	3,695,808	-	461,751	4,157,559	
2011	39,340	76,581	222,619	1,140,000	70,486	2,623,100	4,172,126	2,847,572	420,691	413,160	1,028,542	1,593	4,711,558	-	358,354	5,069,912	
2012	39,420	76,631	222,619	1,140,000	70,486	2,623,100	4,172,256	2,558,699	-	401,523	1,047,832	1,609	4,009,663	-	(537,209)	3,472,454	
2013	39,510	76,681	222,619	1,140,000	70,486	2,623,100	4,172,396	1,620,423	-	582,301	1,166,635	1,641	3,371,000	-	(256,889)	3,114,111	
<b>Total</b>	<b>507,354</b>	<b>1,441,689</b>	<b>7,793,228</b>	<b>44,595,376</b>	<b>1,857,232</b>	<b>85,743,059</b>	<b>141,937,938</b>	<b>80,183,049</b>	<b>9,016,162</b>	<b>13,650,632</b>	<b>43,012,634</b>	<b>154,081</b>	<b>146,016,558</b>	<b>1,834,407</b>	<b>(44,854)</b>	<b>147,806,111</b>	

<sup>a</sup> Values include amounts of deliveries to short-term contractors (Mustang Water District, 1970–1972; Tracy Golf and Country Club, 1974, 1979, and 1980; Green Valley Water District, 1974, 1975, 1978, 1979, and 1980; and Granite Construction Company, 1980).  
<sup>b</sup> Includes amounts of SWP and non-SWP water conveyed for SWP and non-SWP water contractors.  
<sup>c</sup> Includes amounts of water diverted under various water rights agreements.  
<sup>d</sup> Amounts reflect net effect of (1) operational losses from SWP transportation facilities; (2) changes in reservoir storage south of the Delta; (3) storable local inflows to SWP reservoirs; (4) side inflow to San Luis Canal; and (5) inflow into the California Aqueduct from the Kern River Intertie.



## Chapter 10 Power Resources

*Alamo Powerplant.*

## Significant Events in 2013

The Department of Water Resources (DWR) contract with NV Energy (NVE) for up to 235 megawatts (MW) of power from the Reid Gardner Powerplant in Nevada terminated in July 2013.

In 2013, the California Air Resources Board implemented the Cap and Trade program, which also covers greenhouse gas (GHG) emissions from energy imported into California. Consequently, DWR reported emissions associated with energy it imported from the Reid Gardner Powerplant and procured GHG compliance instruments to meet its compliance obligations. DWR also procured GHG compliance instruments to meet contractual obligations unrelated to the Reid Gardner Powerplant.

In February 2013, DWR entered into a power purchase agreement with RE Columbia, LLC to purchase 45 MW of power for 20 years. RE Columbia is a solar photovoltaic project to be constructed in southeastern Kern County. The facility is expected to commence commercial operation by December 31, 2014.

Energy used at the 29 State Water Project (SWP) pumping and generating plants totaled 5.74 million megawatt hours (MWh). To meet SWP energy needs, DWR purchased 2.31 million MWh of energy at a cost of \$85.40 million. This includes: (1) 2.09 million MWh of WSPP short-term energy from 11 marketers (referred to as bilaterals) and one renewable-energy electric utility, at a combined cost of \$73.12 million; (2) 0.22 million MWh of long-term energy, at a cost of \$7.15 million; and (3) \$5.13 million from the bilateral energy trades made through the California Independent System Operator (CAISO).

Pursuant to its excess power sales agreements, DWR sold 1.35 million MWh of energy to 11 WSPP power marketers, long-term contractors, and through bilateral trades with the California Independent System Operator, for a total of \$94.07 million in revenues.

*Information for this chapter was provided by the State Water Project Analysis Office, the SWP Power and Risk Office, and the Hydropower License Planning and Compliance Office.*



Long-term State Water Project (SWP) water contractors depend on the SWP to obtain economical sources of power in order to deliver affordable water. Consequently, the Department of Water Resources (DWR) administers a comprehensive power resources program. Key elements of the program include studies of power resources for future needs, acquisition of long-term power resources and transmission services, short-term purchases or sales of power, and the strategic operation of generation and pumping facilities.

## Power Resources Program

The goals of the SWP power resources program are to:

- obtain reliable, environmentally sensitive, and competitively priced power resources and transmission services sufficient to operate the SWP;
- develop and manage power resources to minimize the cost of water deliveries to SWP water contractors;
- meet responsibilities and criteria of the Western Electricity Coordinating Council (WECC); and
- conform to regulations of the Federal Energy Regulatory Commission (FERC).

To achieve these goals, DWR constructed its own power facilities. Additionally, DWR enters into long-term contracts and short-term arrangements with other electric utilities and with the California Independent System Operator (CAISO) for transmission access and for power purchases and sales. DWR's generators and pumps provide a mix of regulation, spinning, and nonspinning reserves to the CAISO's ancillary services market. DWR's power resources program also takes advantage of SWP water storage and conveyance capacities, which cost-effectively control pump loads and generation.

## Major Electric Utility Industry Developments

In 2013, CAISO continued to correct real-time market inefficiencies and address the impact of increasing renewable generation. In April, CAISO unilaterally introduced the Energy Imbalance Market (EIM) initiative based on a memorandum of understanding with PacifiCorp. Through EIM, CAISO's Real-Time Market is available to non-CAISO balancing authorities, which provides efficiencies by allowing other regions to share resources that are economically and automatically dispatched in real time to provide balancing energy.

On June 22, 2012, FERC issued Order 764, which addressed the removal of barriers that may have prevented integration of Variable Energy Resources (VERs) to the nation's transmission grid. In response to FERC Order 764, CAISO was required to provide a 15-minute scheduling option at the interties for VERs. The CAISO policy design also added 15-minute energy scheduling and settlement for both internal and external resources to help address Real-Time Imbalance Energy Offset (RTIEO) issues. This fixed market flaws that allowed market manipulation and which led to the suspension of convergence bidding at the interties in November 2011.

On June 1, 2013, CAISO activated its Pay for Performance market for frequency regulation compensation, pursuant to FERC's Order 755. Based on certain performance metrics,



CAISO must provide compensation for frequency regulation service along with the associated generation capacity. A majority of the frequency regulation resources bidding into the CAISO market were unable to meet the new performance metrics. To prevent a large portion of the generation fleet from becoming decertified, CAISO filed for a waiver and a 1-year extension with FERC.

After several years of extending the existing Participating Load Agreement (PLA), which allows SWP load to provide demand response, CAISO agreed to amend several provisions that better protect the SWP due to regulatory limitations. These changes became effective November 15, 2013, when FERC approved the Amended and Restated PLA.

CAISO continued the flexible capacity procurement stakeholder process that had been initiated in January 2012. The stakeholder process was intended to address the need for flexible capacity arising from the increased development of renewable energy resources. It also addressed retiring flexible thermal resources subject to regulatory limits set on once-through cooling power plants. Several revisions of the CAISO proposal led to a final draft version for FERC filing.

The California Public Utilities Commission convened the multiyear reliability framework stakeholder process. The joint reliability framework would require multiyear procurement backstop power that would complement existing resource adequacy obligations. This effort would recommend the needed revisions to the California Public Utilities Commission resource adequacy program and the CAISO capacity procurement mechanism tariff provisions.

CAISO also continued with its stakeholder process to implement tariff changes needed to comply with FERC Order 1000. The order reforms electric transmission planning and cost allocation requirements

for public utility transmission providers. The three primary topic areas were: (1) regional planning and cost allocation; (2) nonincumbent transmission developers; and (3) interregional transmission planning coordination and cost allocation. In 2013, Phase 2 of this CAISO stakeholder process focused on implementing tariff changes to comply with areas 2 and 3 above.

CAISO continued to refine policy for the Renewable Integration Market and Product Review (RIMPR) initiative Phase 2, which focused on mid- to long-term solutions.

Also in 2013, DWR procured greenhouse gas (GHG) compliance instruments to meet its compliance and contractual obligations under the Cap and Trade Program administered by the California Air Resources Board.

## DWR Participation in Electric Utility Industry Activities

DWR continued to participate in CAISO's stakeholder processes to help ensure that tariff and business practice manuals are compatible with SWP operations. DWR's participation in CAISO stakeholder processes focused on the following primary elements:

- Market Initiatives Roadmap;
- RIMPR Phase 2;
- Bid Cost Recovery mitigation;
- Ancillary Service (AS) forced buy back;
- Cost Allocation Guiding Principles;
- Grid Management Charge rate structure for 2014;
- FERC Order 755 Pay for Performance;
- Multi-stage generation enhancements;
- Load Granularity Refinements;
- Full Network Model Expansion;
- Barriers to demand response;
- FERC Order 764 compliance;
- Contingency Modeling enhancements;
- Participating Load refinement;

- Flexible ramping product;
- Energy Imbalance Market (EIM) ;
- Generator Interconnection Procedures;
- Transmission planning;
- FERC Order 1000 compliance;
- Local Capacity procurement for 2014 requirements;
- Annual Resource Adequacy processes including the Path 26 allocation, import allocation, and net qualifying capacity; and
- Flexible Capacity Procurement process for 2015.

In addition, DWR participated in the California Energy Commission's planning processes by submitting a demand forecast to the commission.

Besides CAISO and California Energy Commission stakeholder processes, DWR participated in FERC proceedings to help ensure that various market requirements or cost allocation mechanisms were appropriately structured. This included the following major processes and litigations (with FERC docket number given in parenthesis, if applicable):

- CAISO's Pay for Performance regulation (ER13-995, ER13-1055);
- CAISO's Multi-Stage Generation (MSG) enhancements (ER14-93);
- CAISO's Transmission Constraint Relaxation Parameter (ER13-1060);
- CAISO's Local Market Power Mitigation Phase 2 (ER13-967);
- CAISO's Ancillary Services forced buy back and cost allocation (ER12-1630, ER13-707);
- CAISO's Energy Imbalance Market (ER13-1372);
- CAISO's Market-Based Rate Authority suspension (ER12-103, ER13-830);
- CAISO's Reliability Demand Response Resource (ER13-2192);

- CAISO's extension of Participating Load Agreement (ER13-1365);
- CAISO's Amended and Restated Participating Load Agreement (ER14-406);
- CAISO's GHG compliance costs (ER13-219);
- Procurement of Calpine's Sutter Plant under the Capacity Procurement Mechanism (ER12-897-000);
- Pacific Gas and Electric's (PG&E) TO15 proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER13-2022);
- San Diego Gas & Electric's (SDG&E) TO4-Cycle 1 proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER13-941);
- Southern California Edison's (SCE) second annual update to its approved Formula Rate (ER11-3697);
- Trans Bay Cable, LLC's proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER13-2412);
- SCE's proposed annual update to its Transmission Revenue Balancing Account (ER14-464) and Reliability Services tariff (ER14-222);
- SDG&E's proposed annual update to its Transmission Revenue Balancing Account Adjustment and Transmission Access Charge Balancing Account Adjustment (ER13-602); and
- PG&E's proposed annual update to its Transmission Revenue Balancing Account (ER14-81).

## Bulk Electric System Reliability Standards

### Background

The Energy Policy Act of 2005 assigned to FERC responsibility for the Bulk Electric System reliability and required the creation

of an Electric Reliability Organization. The North American Electric Reliability Corporation (NERC) was named the Electric Reliability Organization by FERC in July 2006 and was tasked with establishing reliability standards for the Bulk Electric System. Compliance with NERC reliability standards is mandatory.

WECC is the implementation vehicle for promoting regional electric service reliability in both western Canada and the western United States. WECC oversees implementation of these standards and validation of compliance, including assessment of penalties and/or sanctions. Details of the NERC standards and the attributes of the compliance program appear in Bulletin 132-11.

### ***NERC Reliability Compliance— Program Improvements***

As part of the Energy Policy Act of 2005, NERC and WECC conduct periodic audits of each entity required to comply with NERC's reliability standards. In February 2012, WECC completed an audit of DWR's compliance record and found possible violations. DWR also identified possible violations through a self-reporting process. To address and resolve these possible violations, DWR entered into a settlement agreement on October 30, 2013. The agreement included a monetary fine and changes to DWR's internal compliance program to improve training, communication, and collaboration to ensure prompt detection, reporting, and mitigation of possible violations. To comply with the settlement, DWR must report to WECC on the results of DWR's improvements by May 30, 2014. As a result of the 2012 audit, DWR hired a consultant to review its compliance structure and program. The consultant's review identified gaps, issues, and inefficiencies in the compliance program.

In 2013, DWR completed an implementation plan to develop improved internal compliance program business processes. The

plan details each compliance activity end-to-end and defines each DWR organization's roles and responsibilities by function. Final approval of the plan is expected in 2014.

DWR is committed to a proactive approach that includes continuous education to ensure an understanding of and adherence to NERC's mandatory reliability standards.

On November 22, 2013, FERC approved Version 5 of NERC's Cyber Infrastructure Protection (CIP) Reliability Standards (CIP Version 5), which is intended to make significant progress in mitigating cyber risks to the Bulk Electric System. CIP Version 5 enforcement is scheduled to be phased-in beginning April 2016 and continuing to April 2017. To ensure compliance, DWR will participate in a transition program that NERC and WECC initiated to improve the industry's understanding of the technical security requirements for CIP Version 5, as well as the expectations for compliance and enforcement.

Beginning in November 2013, NERC implemented the Reliability Assurance Initiative (RAI) program to transition compliance and enforcement away from zero tolerance to a focus on reliability. If DWR is able to demonstrate compliance through effective internal controls and self-monitoring of possible violations, then NERC and WECC have the discretion to alter audit frequency and scope, and disposition methods for noncompliance, including a reduction of monetary penalties.

DWR has continued the work required to meet the compliance requirements of the reliability standards. DWR submitted its annual self-certification to WECC in January 2013, involving operations, maintenance, engineering functions, and work on critical cyber assets. This process required DWR to certify that it was currently in compliance with the requirements of a WECC-determined

subset of standards or provide a violation report supported by a mitigation plan to resolve outstanding items. Violations may lead to financial penalties or reduced operating flexibility.

Every year, NERC creates a 3-year plan to address reliability standards development and revision. The Division of Operations and Maintenance aggressively pursues compliance with standards as they change. DWR also submits mitigation plans to WECC when possible violations were discovered as a result of self-audits.

## Hydropower License Planning and Compliance

DWR holds three hydropower licenses issued by FERC: Oroville Facilities, FERC Project No. 2100; South SWP Hydropower, FERC Project No. 2426 (P-2426); and Pine Flat Transmission Line, FERC Project No. 2876. FERC licenses contain terms and conditions related to operations, maintenance, engineering, dam safety, security, environmental and cultural resources, recreation, and public safety. FERC also conducts safety, security, and environmental inspections, and DWR is required to comply with all findings of the inspections. Compliance with FERC requirements is an important function of DWR organizations since FERC has the authority to levy fines for noncompliance. FERC also considers the record of compliance when considering the term of license renewals.

### Oroville Facilities Relicensing

On January 26, 2005, DWR filed an application with FERC requesting a new license for the Oroville Facilities. (More detailed information about the relicensing process is available in previous editions of Bulletin 132.) The existing 50-year license expired January 31, 2007; FERC is issuing annual licenses until the new license is issued. Issuance of the new license has been delayed pending issuance of the

National Marine Fisheries Service (NOAA Fisheries) biological opinion. No significant developments occurred in 2013.

DWR certified the final environmental impact report on July 22, 2008. One month later, Butte and Plumas counties filed a lawsuit challenging the adequacy of the environmental impact report. The case was heard in January 2012, and the court ruled in DWR's favor. (More detailed information about the original lawsuit is available in previous editions of Bulletin 132). However, Butte and Plumas counties filed an appeal of the decision on August 6, 2012. Opening and responding briefs were filed on February 14, 2013, and June, 24, 2013, respectively. In addition, *State Water Contractors Inc., et al.* filed a respondent's brief on June 10, 2013, and Butte and Plumas counties filed an appellant's reply brief on July 31, 2013.

The Habitat Expansion Agreement submitted by DWR and PG&E to NOAA Fisheries for Central Valley salmon and steelhead in 2010 required preparation of a Habitat Expansion Plan (completed in 2010 with NOAA Fisheries consultation initiated in 2012) and annual reporting of activities undertaken to implement the Habitat Expansion Agreement. On July 9, 2013, DWR submitted an annual report describing the activities of the previous 12 months.

On December 4, 2013, DWR's Hydropower License Planning and Compliance Office filed a letter with the State Water Resources Control Board (SWRCB) petitioning the board to reconsider its annual fee for the Clean Water Act Section 401 water quality certification associated with the Oroville Facilities relicensing effort. The SWRCB issued a water quality certification in 2010 for the relicensing effort, but FERC has not yet issued the new license. The SWRCB's regulations provide for a process through which applicants can petition the board to reconsider the annual fee.



### South SWP Hydropower

On June 7, 2013, DWR released the Notice of Availability of the Draft Initial Consultation Documents (ICD) for applying to FERC to convert the regulatory authorizations for the 17 megawatt (MW) Alamo Powerplant and the existing 32.4 MW Mojave Siphon Powerplant to conduit exemptions. The ICD included an associated draft license amendment application requesting FERC's approval to remove Alamo Powerplant and Mojave Siphon Powerplant and associated lands from the P-2426 license, FERC's then-current regulatory authorization for these facilities, and modify the P-2426 license accordingly. DWR held joint agency meetings in July 2013 to seek input from interested agencies, Native American tribes, and the public on the proposed conduit exemption applications, and the public was allowed 60 days to comment on the applications. There were few comments on the applications, and a related request for information from the SWRCB was addressed in October 2013 to the SWRCB's satisfaction.

### Existing SWP Power Facilities

Figure 10-1 shows the names, locations, and nameplate capacities of DWR's primary power facilities.

#### Hydroelectric

Economic hydroelectric generation provides the largest share of SWP power resources. The combined Hyatt Pumping-Generating Plant and Robie Thermalito Pumping-Generating Plant (Hyatt-Thermalito) generate about 2.2 billion kilowatt hours (kWh) of energy in a median water year, while the 3 MW from the Thermalito Diversion Dam Powerplant adds another 24 million kWh per year.

Generation at California Aqueduct recovery plants—Alamo, Devil Canyon, Gianelli, Mojave Siphon, and Warne—varies with the amount of water conveyed. These five plants

generate about one-sixth of the total energy used by the SWP.

#### Coal

Since July 1983, under the *Participation Agreement Reid Gardner Unit No. 4* between DWR and NV Energy (NVE), DWR has received energy from Reid Gardner Powerplant, a coal-fired facility in Nevada. Reid Gardner Powerplant consists of four units. DWR owned 67.8 percent of Unit 4, and NVE owned the remainder of Unit 4, as well as all of Units 1, 2, and 3. Under this agreement, DWR received up to 235 MW from Unit 4, subject to NVE's limited right to interrupt DWR's energy deliveries. Whenever NVE interrupted DWR's scheduled energy, DWR received payment based on NVE's combustion turbine costs. The Reid Gardner agreement expired in July 2013, and DWR did not extend or renew this agreement.

### DWR Power Planning Activities

DWR does long-term power planning for the SWP through periodic development of an Integrated Resource Plan. The Integrated Resource Plan concludes with plans for long-term and mid-term power procurements necessary to provide power to operate the SWP and ensure rate stability through energy market disruptions. Initial studies for the next version of the IRP were underway in 2013.

DWR had completed a power planning study in 2011 of the economic viability of a second unit at the Alamo Powerplant, which would be a qualified renewable small hydroelectric facility. The project was shown to provide substantial energy and GHG reduction benefits to DWR. Following the power planning study, DWR initiated a design study in 2012 to determine whether a surge chamber would be required and to conclude the project cost estimates. A project implementation decision will be made following completion of the design and cost studies.





**Figure 10-1 Names, Locations, and Nameplate Capacities of Primary Long-term Power Facilities**

In May 2012, DWR's CEQA (California Environmental Quality Act) Climate Change Committee oversaw the completion of DWR's Climate Action Plan (CAP) Phase I: Greenhouse Gas (GHG) Emissions Reduction Plan that established DWR's overall GHG emissions strategy. CAP Phase I assesses GHG emissions from on-going activities, sets goals for GHG reductions that will exceed State GHG mandates, and presents plans for how emissions reductions will be achieved. It memorialized the previously approved SWP Renewable Energy Procurement Plan, completed in February 2010, as the method to achieve the SWP's CAP Phase I emission reduction goals. DWR initiated renewable energy procurements in late 2012 and 2013 in accordance with the CAP Phase I and Renewable Energy Procurement Plan.

## Contractual Resource Arrangements

Through joint development, DWR obtains a significant amount of capacity and energy for SWP operations from other utilities throughout California and the Southwest. However, with the implementation of the CAISO Market Redesign and Technology Upgrade (MRTU) in April 2009, and implementation of CAISO's power markets that provide access to affordable day-ahead and real-time energy, DWR is less reliant on marketers and other utilities to meet its net energy needs.

### Joint Developments

In 1966, DWR entered into a contract with the Los Angeles Department of Water and Power (LADWP) for joint development of the West Branch of the California Aqueduct. LADWP constructed and operates Castaic Powerplant, which is a pumped-storage facility connected to the LADWP transmission system at the Sylmar Substation. DWR receives capacity and energy at the Sylmar Substation based on weekly water schedules through the West Branch.

Gianelli Pumping-Generating Plant is a joint-use facility owned and operated by DWR and the Bureau of Reclamation. DWR's share is 222 MW, and the Bureau of Reclamation's share is 202 MW.

### Long-term Purchase Agreements

In 1979, DWR entered into a contract with Kings River Conservation District to receive the output of the 165 MW hydroelectric Pine Flat Powerplant. The power plant supplies the SWP with about 400 million kWh of energy in median water years.

DWR also contracts for the energy output of five hydroelectric plants totaling 30 MW owned and operated by The Metropolitan Water District of Southern California (Metropolitan).

In May 2010, DWR entered into an agreement with the Northern California Power Agency (NCPA) and various public agencies to finance, construct, operate, and maintain the Lodi Energy Center—a new 280 MW natural gas combined cycle combustion turbine generation facility that NCPA would own and operate, and from which DWR would receive 33.5 percent of the output. Construction of the Lodi Energy Center began in July 2010 and continued on schedule through 2011. The facility achieved its commercial operation date on November 27, 2012.

In an effort to add "green" generating resources to the SWP's energy portfolio, DWR entered into a renewable Power Purchase Agreement with Alameda Municipal Power. The new contract will provide certified renewable energy, with 28.3 MW from an existing geothermal project and 5.3 MW from landfill gas energy. Under this agreement, DWR will receive an estimated 183,000 megawatt hours (MWh) of annual generation. The geothermal plants are owned and operated by NCPA and are located at The Geysers geothermal field

in Middletown, California. The landfill gas energy under the new contract will come from the Republic Services' Ox Mountain Landfill gas-to-energy plant in Half Moon Bay. The plant is owned and operated by a subsidiary of Ameresco, Inc. Landfill gas is created when organic waste decomposes, producing methane—the primary ingredient in natural gas and a greenhouse gas.

The new energy contract will move DWR closer to its goal of reducing emissions by 50 percent below 1990 levels by 2020. The agreement term is October 15, 2012, through December 31, 2016.

In February 2013, DWR entered into a power purchase agreement with RE Columbia, LLC to purchase 45 MW of capacity, energy, and all capacity and environmental attributes for a period of 20 years. RE Columbia is a solar photovoltaic project to be constructed in southeastern Kern County, California. This facility is expected to commence commercial operation by December 31, 2014, and to produce approximately 124,000 MWh of energy annually. The new renewable energy contract will keep DWR on target with its approved 2010 Renewable Energy Procurement Plan.

### **Short-term Purchase Agreements**

DWR typically transacts with member utilities and energy marketers of the WSPP. In 2013, these transactions included capacity to meet the requirements of resource adequacy, which is a planning and procurement process to ensure adequate resources.

In addition to transactions under the WSPP master agreement, DWR can purchase surplus energy from Metropolitan's Colorado River Aqueduct system according to the terms of the 1988 Coordination Agreement between DWR and Metropolitan. This agreement also provides for monthly surplus firm and economy energy sales from DWR to Metropolitan and energy exchanges between DWR and Metropolitan.

## **Load Management**

DWR operates its pumps through an extensive computerized network. This control system, coupled with the operating flexibility of DWR's pumping and generating plants provided by storage reservoirs, allows DWR to maximize pumping during off-peak periods when power costs are lower—usually at night—and maximize power generation during on-peak periods when power costs are higher. By taking advantage of this scheduling flexibility, when not restricted by operating requirements, SWP pump load and generation are optimized to reduce the net cost of power needed for SWP water deliveries.

### **Demand Response**

DWR is the largest single supplier of demand response in the CAISO market via a Participating Load Agreement under which DWR bids SWP load to be curtailed by CAISO when the price of energy in the CAISO market reaches DWR's bid price. Due to DWR's water delivery priority, these bids are normally restricted to contingency events.

## **Contractual Transmission Agreements**

DWR has contracts with CAISO, PG&E, and SCE for both transmission interconnections and network transmission service for SWP's power resources and pumping loads.

Under the Comprehensive Agreement with PG&E, DWR interconnects SWP power resources and pumping loads and receives 1,300 MW of firm network transmission service over the PG&E transmission system to serve SWP pump loads and power resources in Northern and Central California. Upon implementation of CAISO's MRTU on April 1, 2009, transmission service to serve the SWP under the Comprehensive Agreement was redefined as point-to-point service. The remaining transmission service in Northern and Central California, which



cannot be provided through the point-to-point service under the Comprehensive Agreement, is received from CAISO. Through the Comprehensive Agreement, DWR also provides a Remedial Action System to PG&E whereby certain SWP pumping and generating plants can be instantaneously curtailed under certain predefined emergency events.

In anticipation of the upcoming termination of the Comprehensive Agreement on December 31, 2014, DWR initiated negotiations with PG&E and CAISO on successor arrangements.

In October 2013, DWR submitted a proposal into the CAISO Transmission Planning Process whereby DWR would continue to provide the Remedial Action System as described in the Comprehensive Agreement past the forthcoming termination of that agreement. The proposal conditioned the provision of the Remedial Action System on the receipt of appropriate compensation.

In Southern California, DWR receives transmission service for SWP loads and resources through CAISO, and DWR has an interconnection agreement with SCE. Additionally, DWR has wholesale distribution service agreements with SCE for service over SCE's distribution transmission system from the CAISO interchange points to SWP loads and resources.

In March 2013, DWR and SCE executed a new interconnection agreement for DWR's new Citrus Pump Station, to be located in San Bernardino County, which is expected to achieve its commercial operation date in 2015.

Under the participation agreement with NVE, DWR receives 235 MW of firm transmission service over NVE's transmission system between Reid Gardner Unit 4 and the El Dorado Substation. Effective July 25, 2013,

this firm transmission service was terminated due to the expiration of the Reid Gardner agreement.

## SWP Power Operations in 2013

Tables 10-1 through 10-4 present historical information about SWP power operations for calendar year 2013, including energy consumed, generated, purchased, and sold.

Please note that, in some instances, the tables in this chapter may not sum as expected due to rounding.

### Energy Consumed

In 2013, energy used at the 29 SWP pumping and generating plants totaled 5.73 million MWh. According to the terms and conditions of various water conveyance contracts and exchange agreements, some water belonging to the Central Valley Project is pumped through Banks and Dos Amigos pumping plants and Gianelli Pumping-Generating Plant. The Bureau of Reclamation furnishes additional energy for this purpose.

Table 10-1 shows the amount of energy used each month at SWP pumping and power generating plants to operate the SWP in 2013, excluding transmission losses.

### Energy Generated and Purchased

Table 10-2 shows the amounts of energy generated at SWP facilities in 2013, as well as energy purchased for SWP operations.

### Hydroelectric and Coal

The Hyatt-Thermalito power complex in Oroville generated 1.49 million MWh of energy in 2013.

Energy generated at SWP aqueduct recovery plants—Gianelli, Alamo, Devil Canyon, Mojave Siphon, and Warne—totaled 1.08 million MWh.

The SWP share of energy generated at the coal-fired Reid Gardner Powerplant in Nevada totaled 0.49 million MWh. DWR's 67.8 percent ownership share in Reid Gardner Unit 4 ended in July 2013.

## Contractual Resource Arrangements

SWP power operations rely on contractual arrangements as well as SWP facilities. These contractual arrangements include joint development projects and energy purchases.

### Joint Developments

Through the *West Branch Cooperative Development Agreement* with LADWP, DWR receives energy based on the amount of water scheduled through the West Branch. In 2013, LADWP provided 610,768 MWh for DWR's share of energy generated at Castaic Powerplant.

DWR's share of Gianelli Pumping-Generating Plant used 101,647 MWh and generated 86,486 MWh of energy.

### Purchases and Costs

Table 10-3 shows amounts of energy, transmission, and other services purchased in 2013, and the cost of purchases. Amounts include contractual short-term and long-term purchases and associated transactions of energy, transmission, capacity, and ancillary services with CAISO, and miscellaneous energy-related costs.

DWR purchased 2.31 million MWh of energy at a cost of \$85.40 million. Other SWP-related costs include \$9.66 million for transmission service outside CAISO and \$197.55 million for operation, maintenance, and miscellaneous CAISO charges, among other things. Other key costs associated with the latter amount are (1) \$4.31 million for debt service and \$5.18 million for operations and maintenance, both related to Pine Flat Powerplant; (2) \$23.65 million for operations, maintenance, fuel, insurance, waste

removal, and property taxes at Reid Gardner Unit 4; and (3) \$9.45 million for debt service and \$19.85 million for capital improvement, fuel, management, operations, maintenance, and GHG allowance connected to the Lodi Energy Center Project. The \$9.66 million for transmission service outside CAISO includes \$5.72 million for PG&E; \$2.64 million for SCE; and a total of \$1.29 million related to LADWP, NCPA, and NVE.

**Long-term Purchase Agreements.** According to terms of the Kings River Conservation District contract, DWR receives the total output of the 165 MW Pine Flat Powerplant. In 2013, the power plant provided 116,648 MWh of energy to the SWP at an energy component cost of \$913,442.

Under the Metropolitan Small Hydro contract, DWR purchased 109,205 MWh of energy in 2013 from five small hydroelectric power plants on the Metropolitan system at a cost of \$6.23 million.

Also, under the Lodi Energy Center Power Sales Agreement with NCPA, DWR received a purchase credit of \$18 million based on 405,852 MWh generated at the Lodi Energy Center plant during 2013. For reporting purposes, these amounts are part of the total revenues listed in Table 10-4.

### Short-term Energy Purchase Agreements.

Existing resources and long-term power and transmission contracts ensure that the SWP has enough power to meet long-term needs.

When SWP power requirements exceed resources during daily operations, short-term purchases make up the difference. In 2013, the SWP purchased 2.09 million MWh of short-term energy under the WSPP agreement from 11 WSPP marketers and one public electric utility at a cost of \$73.12 million.



**Table 10-1 Energy Used at Pumping Plants and Power Plants in 2013, by Month (megawatt-hours)**

Pumping Plants and Power Plants	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Hyatt-Thermalito Power Complex (station service)	1	0	14	2	0	180	342	46	106	1	0	0	691
North Bay Interim Pumping Plant	0	0	0	0	0	0	0	0	0	0	0	0	0
Cordelia Pumping Plant	479	562	314	854	1,550	1,429	1,136	1,144	1,008	1,256	1,351	1,147	12,230
Barker Slough Pumping Plant	176	206	122	424	1,310	1,390	1,342	1,367	1,135	1,214	711	625	10,022
South Bay Pumping Plant	3,969	6,236	7,639	14,369	13,260	12,875	14,581	12,454	10,072	11,759	10,146	7,063	124,423
Del Valle Pumping Plant	29	26	75	285	119	12	12	14	15	18	23	27	654
Banks Pumping Plant	45,893	27,354	44,594	21,348	15,731	32,243	88,404	95,369	44,786	20,253	32,982	28,479	497,438
Gianelli Pumping-Generating Plant (SWP share)	23,654	4,466	19,334	0	40	2	3,247	23,292	4,834	339	11,750	10,689	101,647
Dos Amigos Pumping Plant (SWP share)	13,660	15,426	12,737	18,916	21,489	28,113	40,000	27,443	26,233	20,967	8,491	5,984	239,460
Buena Vista Pumping Plant	21,859	22,376	24,005	30,821	28,107	28,509	42,530	30,919	29,526	28,594	24,590	20,806	332,642
Teerink Pumping Plant	23,620	25,446	25,623	30,762	26,908	26,606	42,274	29,656	29,912	29,888	28,056	24,262	343,012
Chrisman Pumping Plant	53,080	56,521	56,577	67,109	56,857	56,124	91,023	63,545	65,174	65,944	62,472	54,202	748,627
Edmonston Pumping Plant	194,969	207,378	207,413	244,124	204,188	199,737	327,323	228,323	235,778	239,874	230,750	200,249	2,720,105
Alamo Powerplant (station service)	0	0	0	0	0	0	17	47	2	3	6	40	115
Pearblossom Pumping Plant	36,343	33,127	21,445	27,198	24,835	24,146	27,928	25,497	26,403	36,581	26,830	11,393	321,727
Pine Flat Powerplant (station service) <sup>a</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0
Mojave Siphon Powerplant (station service)	30	8	14	10	19	17	13	15	11	1	6	65	209
Devil Canyon Powerplant (station service)	3	5	2	0	0	1	1	0	0	1	0	125	138
Oso Pumping Plant	7,884	10,567	14,892	16,192	12,149	11,782	25,260	14,425	15,506	12,158	15,306	18,455	174,577
Warne Powerplant (station service)	404	265	209	0	2	116	0	2	4	295	210	165	1,672
Las Perillas Pumping Plant	192	340	352	800	1,185	1,468	1,650	1,448	844	737	68	121	9,204
Badger Hill Pumping Plant	476	885	912	2,084	3,011	3,597	3,869	3,603	2,111	1,844	144	277	22,813
Devil's Den Pumping Plant	897	827	1,272	1,178	1,463	1,589	1,671	2,044	1,961	1,782	203	658	15,544
Bluestone Pumping Plant	842	786	1,187	1,098	1,364	1,469	1,604	1,960	1,882	1,708	189	609	14,697
Polonio Pass Pumping Plant	906	846	1,282	1,186	1,476	1,586	1,648	2,020	1,943	1,758	206	665	15,520
Greenspot Pump Station	1,069	104	34	1,005	1,506	1,363	1,653	1,328	1,433	1,167	1,085	908	12,655
Crafton Hills Pump Station	1,457	128	25	1,237	1,553	1,582	1,850	1,487	1,414	1,445	1,368	1,262	14,808
Cherry Valley Pump Station	106	21	15	94	109	100	107	111	94	106	97	107	1,066
<b>Total Energy Required for SWP<sup>b</sup></b>	<b>431,997</b>	<b>413,907</b>	<b>440,089</b>	<b>481,096</b>	<b>418,235</b>	<b>436,038</b>	<b>719,482</b>	<b>567,558</b>	<b>502,184</b>	<b>479,693</b>	<b>457,036</b>	<b>388,382</b>	<b>5,735,699</b>

<sup>a</sup> Pine Flat station service energy provided by CAISO under MRTU operation.

<sup>b</sup> Totals may not sum as expected due to rounding.

**Table 10-2 Energy Generated and Purchased in 2013, by Month (megawatt-hours)**

Sources of Energy	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>SWP Energy Sources</b>													
Hyatt-Thermalito Power Complex	73,412	41,977	105,384	100,325	112,095	184,973	274,644	234,591	105,461	89,408	93,877	74,482	1,490,631
Gianelli Pumping-Generating Plant (SWP share)	2,817	2,673	0	18,992	22,000	20,097	2,611	117	4,010	12,439	0	730	86,486
Alamo Powerplant	0	0	0	0	0	0	3,910	1,688	5,210	6,599	4,712	2,082	24,200
Mojave Siphon Powerplant	3,372	3,693	2,144	2,991	2,623	2,613	2,969	2,698	2,882	3,773	2,723	1,183	33,666
Devil Canyon Powerplant	62,539	61,401	38,938	46,607	46,483	41,265	49,308	44,564	46,096	65,748	48,294	20,993	572,237
Reid Gardiner Unit 4	65,121	56,846	54,805	64,546	66,153	99,560	86,727	0	0	0	0	0	493,758
Warne Powerplant	16,735	21,674	30,916	34,653	26,613	25,611	52,513	30,748	32,764	25,584	32,045	37,706	367,561
<i>Subtotal</i>	<i>223,997</i>	<i>188,264</i>	<i>232,188</i>	<i>268,114</i>	<i>275,967</i>	<i>374,119</i>	<i>472,682</i>	<i>314,407</i>	<i>196,423</i>	<i>203,551</i>	<i>181,650</i>	<i>137,176</i>	<i>3,068,539</i>
<b>Energy Sources from Long-term Agreements</b>													
Castaic Powerplant	25,006	34,038	51,622	57,427	44,211	43,451	85,689	50,249	53,767	45,241	55,698	64,368	610,768
Metropolitan Small Hydro Generation	7,176	7,674	8,370	8,212	8,183	8,304	8,059	8,398	9,271	14,130	11,191	10,236	109,205
Pine Flat Powerplant (Kings River Conservation District)	0	0	3,521	10,968	20,476	45,744	34,178	1,761	0	0	0	0	116,648
Energy to Metropolitan for CRA <sup>a</sup> Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy from Metropolitan for CRA <sup>a</sup>	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodi Energy Center	27,733	34,144	42,965	45,030	10,918	26,875	41,062	31,718	30,872	33,080	35,203	46,252	405,852
<b>Purchases</b>													
Purchases (Firm and WSPP Contracts)	172,195	130,000	233,685	151,783	139,337	135,243	163,609	171,843	217,211	193,919	198,312	179,922	2,087,059
CAISO Energy <sup>b</sup>	(3,310)	29,386	(83,087)	44,162	5,442	(67,198)	59,802	140,381	90,641	32,972	44,983	(19,572)	274,604
<i>Subtotal</i>	<i>228,800</i>	<i>235,243</i>	<i>257,076</i>	<i>317,582</i>	<i>228,568</i>	<i>192,419</i>	<i>392,400</i>	<i>404,351</i>	<i>401,761</i>	<i>319,342</i>	<i>345,386</i>	<i>281,207</i>	<i>3,604,135</i>
Total Resources	452,797	423,507	489,264	585,696	504,535	566,538	865,082	718,758	598,184	522,893	527,036	418,382	6,672,674
Less Energy Sales	(20,800)	(9,600)	(49,175)	(104,600)	(86,300)	(130,500)	(145,600)	(151,200)	(96,000)	(43,200)	(70,000)	(30,000)	(936,975)
<b>Total Energy Provided to the SWP<sup>c</sup></b>	<b>431,997</b>	<b>413,907</b>	<b>440,089</b>	<b>481,096</b>	<b>418,235</b>	<b>436,038</b>	<b>719,482</b>	<b>567,558</b>	<b>502,184</b>	<b>479,693</b>	<b>457,036</b>	<b>388,382</b>	<b>5,735,699</b>

<sup>a</sup> Contractual Resource Arrangement.  
<sup>b</sup> Energy provided by CAISO for balancing the total SWP loads and resources.  
<sup>c</sup> Totals may not sum as expected due to rounding.

**Table 10-3 Energy, Transmission, and Related Costs in 2013**

Category	Energy Purchased (MWh)	Energy Cost (in dollars)	Transmission Cost Outside CAISO (in dollars)	Other Energy-related Costs (in dollars)	Total Cost (in dollars)
CAISO–Bilateral Trades <sup>a</sup>		5,125,684			5,125,684
CAISO–Other <sup>b</sup>				133,907,800	133,907,800
Energy Marketers–Bilaterals (WSPP)	1,905,775	67,142,281		1,186,550	68,328,831
Long-term Contracts <sup>c</sup>	225,849	7,145,774	9,662,694	62,451,178	79,259,646
Renewable Energy (WSPP) <sup>d</sup>	181,284	5,982,372			5,982,372
<b>Total</b>	<b>2,312,908</b>	<b>85,396,111</b>	<b>9,662,694</b>	<b>197,545,528</b>	<b>292,604,333</b>

<sup>a</sup> As invoiced.<sup>b</sup> Transmission, capacity, imbalance energy, etc.<sup>c</sup> California Power Exchange, Kings River Conservation District, Los Angeles Department of Water and Power, The Metropolitan Water District of Southern California, NV Energy, Northern California Power Agency, Pacific Gas & Electric Company, and Southern California Edison.<sup>d</sup> Alameda Municipal Power.**Table 10-4 Energy Sold in 2013 and Revenues from Sales per Contract Agreements**

Category	Energy Sold (MWh)	Revenue from Energy Sales (in dollars)	Other Energy-related Revenue (in dollars)	Total Sales (in dollars)
CAISO–Bilateral Trades <sup>a</sup>		33,352,289		33,352,289
CAISO–Other <sup>b</sup>			47,436,820	47,436,820
Energy Marketers–Bilaterals (WSPP)	936,975	42,323,955	355,000	42,678,955
Long-term Contracts <sup>c</sup>	413,462	18,391,270	1,871,216	20,262,486
<b>Total</b>	<b>1,350,437</b>	<b>94,067,514</b>	<b>49,663,036</b>	<b>143,730,550</b>

<sup>a</sup> As invoiced.<sup>b</sup> Transmission, capacity, imbalance energy, etc.<sup>c</sup> Los Angeles Department of Water and Power, Northern California Power Agency, NV Energy, City of Santa Clara, and Western Area Power Administration.

## Contractual Sales of Excess Power

In 2013, DWR sold 1.35 million MWh of energy for a total of \$94.07 million. These sales included 936,975 MWh of energy with revenue of \$42.32 million transacted through WSPP and sold to 11 marketers. They also included 413,462 MWh with revenue of \$18.39 million sold to long-term contractors, and \$33.35 million connected to bilateral trades with CAISO. DWR also received \$49.66 million in revenues from capacity and other energy-related services. This value includes, among other things, \$47.44 million for ancillary services transactions made through CAISO. It also includes \$369,135 for ancillary service fees collected from the U.S. Department of Energy, Western Area Power Administration, associated with the June 27, 2012, contract with DWR for CAISO Scheduling Coordinator Services. Under

the terms of this contract, DWR acts as a scheduling coordinator for the joint-use facilities of the San Luis Unit and certain DWR pumping facilities occasionally used to pump federal water. See Table 10-4 for information about energy and other services sold and revenue received.

## Forecasting Power Operations

Each year, after reviewing the SWP water contractors' water delivery requests and the construction schedule for future facilities, DWR forecasts the associated energy consumption and generation through 2035. Short-term power requirements, based on actual water supply and reservoir storage levels, are determined for the current and two ensuing years of operation. Long-term

operational studies for the remaining years are based on median-year water supply conditions and optimal reservoir storage levels. The forecast also includes losses in reservoirs and aqueducts, recreation water, and water to replace storage in reservoirs south of the Delta.

Actual SWP power requirements may vary significantly from the forecast amounts. Those variations are due to the amount of water available and delivered in a given year. For example, dry conditions in Northern California could result in a reduction in the amount of water available for delivery and for generation. If full deliveries could not be made, less power would be used. Power requirements could also decrease during a wet year because of the availability of local water in the San Joaquin Valley or Southern California.

Conversely, power requirements could exceed the amount originally forecast if actual water deliveries are greater than the amounts estimated. For example, if additional pumping is needed to refill reservoirs south of the Delta after an unexpectedly dry year, more power would be used.







## **Chapter 11**

# **Facilities Maintenance**

*Devil Canyon Powerplant Second Afterbay.*

## Significant Events in 2013

*M*aintenance, flow testing, and calibration of the Thermalito Diversion Dam's 42-inch fixed cone valve was performed in March 2013. This work was performed in anticipation of its potential future use to make regulatory releases to the low-flow section of the Feather River.

On July 8, 2013, Clifton Court Forebay Intake Structure Gate No. 2 failed and required retrieval from the reservoir. Emergency repair work to return Gate No. 2 to service continued through the remainder of the year under Specification No. 13-15. The subsequent forensic investigation identified the failure of the gate connecting link eyelet (due to wear and corrosion) as the triggering event. The trunnion anchor tendons failed shortly thereafter, allowing the inflow to detach the gate from the control structure.

Full open testing of the Thermalito Diversion Dam's 14 radial gates was performed between September and October 2013.

In 2013, a section of the Gorman Creek improvement channel between Stations 130 and 143 was converted from an open channel to an 8-foot diameter reinforced concrete pipeline.

Construction of the Crafton Hills Reservoir enlargement dam continued during 2013. The Crafton Hills Reservoir enlargement project, which began in January 2012, is not scheduled to be completed until late 2014. The project includes the construction of a new 500-foot long embankment dam, a connector channel enlarging the reservoir, and new access roads.

*Information for this chapter was provided by the Division of Operations and Maintenance, the Division of Safety of Dams, the Division of Integrated Regional Water Management, and the State Water Project Analysis Office.*

The Department of Water Resources (DWR), through the Division of Operations and Maintenance (O&M), monitors all State Water Project (SWP) facilities to ensure safety and reliability. DWR is required, by federal and State law, to contract periodically with independent consultants to review the safety of SWP dams and power facilities.

## Inspecting and Maintaining Project Dams

DWR conducts several types of inspections of SWP facilities to ensure that each dam is safe for continued operation. O&M staff collect and evaluate data regarding the performance of each facility. The Division of Safety of Dams (DSOD) has several programs to ensure the safety of SWP dams. DSOD engineers inspect SWP dams annually, on a fiscal year basis, to ensure they remain safe, are performing as intended, and are not developing problems. These annual inspections also include in-depth instrumentation review of dam surveillance data. Engineers from DSOD also evaluate proposed modifications to existing dams, as well as designs for any proposed new jurisdictional dams. DSOD also oversees construction activities to ensure work is performed in accordance with the approved plans and specifications. The Federal Energy Regulatory Commission (FERC) inspects all licensed SWP facilities annually. These inspections include a review of significant events, instrumentation data, and the visual appearance of each dam, penstock, or power plant. In addition, under FERC and California Water Code requirements, consulting engineers and geologists are retained to evaluate SWP dam facilities every 5 years.

DWR contracts periodically with independent consultants to review the safety of SWP dams and power facilities, except for Pearblossom Spill Basin. Pearblossom Spill Basin Dam was originally designed to be used during misoperation at the Pearblossom Pumping Plant; the spill basin was never fully completed and has never been used.

## Routine Inspections

During 2013, DSOD, along with O&M staff, inspected Bethany, Clifton Court, Del Valle, and Patterson dams in the Delta Field Division as part of the Director's Safety Review Board; Antelope, Frenchman, and Grizzly Valley dams in the Upper Feather River area; Oroville, Thermalito Forebay, Thermalito Afterbay, Thermalito Diversion, Bidwell Canyon Saddle, Parish Camp Saddle, and Feather River Fish Barrier dams in the Oroville Field Division; and Castaic, Crafton Hills, Cedar Springs, Perris, Pyramid, and Devil Canyon Powerplant Second Afterbay dams in the Southern Field Division.

## Joint-use Facility Inspection

The four dams in the San Luis Field Division (Sisk Dam, O'Neill Dam, Los Banos Detention Dam, and Little Panoche Detention Dam) are used jointly with the Bureau of Reclamation (Reclamation) and are not under DSOD jurisdiction. Every 6 years, Reclamation conducts a Comprehensive Facility Review (CFR) of these joint-use facility dams. The CFRs for Sisk Dam, O'Neill Dam, Los Banos Detention Dam, and Little Panoche Detention Dam occurred in 2009. Periodic Facility Reviews (PFRs) are also conducted by Reclamation every 6 years using an alternate schedule spaced between the CFRs. PFRs were conducted for the joint-use facilities in 2012. A joint annual inspection of the facilities with Reclamation, O&M's Dam Safety Branch, and San Luis Field Division was conducted in November 2013.



## Independent Reviews

### California Water Code Reviews

To comply with the California Water Code and the California Code of Regulations, DWR is required to retain a consulting board to review: (1) the adequacy of the design of any dam or reservoir DWR proposes to construct and (2) the safety of the completed construction, including the terms and conditions for the Certificate of Approval.

These provisions require DWR to retain a board of three consultants to meet at least once every 5 years to review the operational performance of DWR-owned dams and more frequently when consulting on new dams. The board of consultants independently reviews and assesses safety conditions of SWP dams.

Consultants are selected based on their knowledge of geotechnical, structural, and civil engineering, including their experience evaluating dam performance. Their independent assessments include the review of dam performance during earthquakes, evaluation of instrumentation data, inspection of each dam, and evaluation of studies performed by DWR. The consultants then prepare reports on each dam, approving dams as safe for continued operation and making recommendations. Based on these recommendations, DWR prepares action plans.

In 2013, an independent consulting Director's Safety Review Board inspection was held for Bethany, Clifton Court Forebay, Del Valle, and Patterson dams. The independent consultants also participated in a Potential Failure Mode Workshop for these dams.

### FERC Reviews

FERC reviews and the FERC Part 12D safety inspections, which may be conducted by one or more consultants, are scheduled

every 5 years. No Part 12D safety inspections occurred for SWP dams in 2013. As a supplement to the FERC Part 12D safety inspection, FERC's Dam Safety Performance Monitoring Program requires that a Potential Failure Mode Analysis be performed for FERC-licensed dams. The Potential Failure Mode Analysis involves document review and site visits to develop a comprehensive list of potential failure modes at each dam. From this review process, three documents are generated: the FERC Part 12D Safety Inspection Report; the Potential Failure Mode Analysis Report; and the Supporting Technical Information document, which summarizes the project elements and details that do not change significantly over time. The FERC monitored facilities are also inspected annually by O&M and the FERC Dam Safety engineer.

## Arroyo Pasajero Program

The Arroyo Pasajero and its tributaries drain approximately 530 square miles of the Diablo Range of the coastal mountains west of the California Aqueduct in Fresno County. Its downstream juncture with the San Luis Canal segment of the California Aqueduct, between Highway 198 and Avenal Cutoff Road, poses a particularly difficult operational and maintenance problem for the SWP. Reclamation designed and constructed the San Luis Canal segment of the California Aqueduct, while DWR operates and maintains it, with all costs shared 45 percent and 55 percent, respectively.

During periods of heavy rainfall, high flows in the Arroyo Pasajero and its tributaries transport heavy sediment loads eroded from the Arroyo Pasajero watershed. Over a vast amount of time, sediment transported by arroyo floods formed a 450-square-mile alluvial fan extending from its apex at the eastern margin of Pleasant Valley (Anticline Ridge) to the San Joaquin Valley trough. The California Aqueduct traverses the arroyo's alluvial fan and forms a barrier to

arroyo flood flows. Flood control facilities, designed to accommodate Arroyo Pasajero floodwater, include the West Side Detention Basin (designed to store floodwater and sediment west of the California Aqueduct), an evacuation culvert to release floodwater east of the California Aqueduct, and drain inlets to release floodwater into the California Aqueduct.

Since the floods of 1969, when nearly all of the detention basin's planned 50-year sediment storage capacity was filled by deposition, DWR and Reclamation have worked to mitigate the effects of heavy flooding and the diminished storage capacity of the detention basin. In 1980, asbestos discovered in The Metropolitan Water District of Southern California's water supply was traced to runoff from the Arroyo Pasajero and other Diablo Range streams. This discovery, in conjunction with the high cost of removing sediment from the California Aqueduct, led DWR to adjust operating procedures to minimize runoff entering the California Aqueduct. The volume of runoff and sediment transported by the Arroyo Pasajero is roughly 400 percent greater than was originally estimated during the design of the detention basin in the mid-1960s.

### **DWR and DWR/Reclamation Alternative Long-term Solution**

Construction to restore the storage capacity of the West Side Detention Basin started in August 2004, and many of the designed improvements were completed by the summer of 2005. These improvements restored the storage capacity to the detention basin and added control over releases of floodwater into the California Aqueduct and onto private farmland. The intended 50-year level of protection was achieved by raising levees, adding a control structure equipped with an inflatable rubber dam, installing flood gates, and acquiring flood easements. As of 2013, the basin's flood control features continued to function as expected.

In 2009, DWR signed the certificate of acceptance for the deeds for easements and lands acquired via litigation. The deeds were recorded, and the process to transfer the rights to Reclamation, as required by the joint-use agreement, was initiated. In 2011, the transfer documents were completed and submitted to Reclamation for acceptance. In 2012, DWR worked with Reclamation staff to address issues with the transfer documents. The biggest issue was the State's use of Director's deeds to transfer the titles verses warranty deeds that are required by Reclamation. Work to address the transfer documents continued in 2013.

The West Side Detention Basin is an area of interest in the U.S. Environmental Protection Agency (EPA) Atlas Mine Area Operable Unit Record of Decision issued by the EPA in 1991. Five-year reviews of the Atlas Mine Area Operable Unit began in 2001, and have continued every 5 years since. In fall 2010, as a part of the upcoming 2011 review cycle, DWR toured the basin with representatives from the EPA and inspected all of the basin flood control features as well as soil berms, gates, locks, and signs used to deter soil disturbing activities. The EPA released its Five-Year Review Report in August 2011. The report contained various recommendations for DWR to take into consideration while operating the basin. As of 2013, DWR continued its standard operating procedures within the basin to comply with the EPA's Comprehensive Environmental Response Compensation and Liability Act (Superfund law).

### **Related Activities**

In September 2011, the California Department of Transportation (Caltrans) informed DWR that it had funding through final design on the proposed bridge project at Lassen Avenue (State Route 269) over Arroyo Pasajero. DWR provided comments on the current project study report in October 2011, which focused on flood control and the



ongoing O&M needs of DWR's field division staff to properly maintain the channel. During 2012, Caltrans requested clarification of DWR's previously recommended borrow sites. Due to concerns over flood impacts and O&M operations, DWR provided Caltrans with a new recommended borrow site located within the Westside Detention Basin land already owned in fee title. Throughout 2013, DWR worked with Caltrans to accommodate heavy equipment passage underneath the proposed bridge to allow DWR to continue its O&M operations to properly maintain the channel.

### **Cantua Creek Stream Group**

Planning for a restoration project similar to the West Side Detention Basin restoration project began in 2006 for the Cantua Creek Stream Group detention basins. The project goal is to improve aqueduct flood protection and water quality between Mileposts 128.48 and 141.57.

A feasibility-level study for the Cantua Creek Stream Group Improvements Project, completed in April 2011, identified actions such as raising embankments, making modifications to structures, and acquiring flood easements to provide a 50-year level of protection for the California Aqueduct at the Cantua Creek Stream Group. Improving water quality in the aqueduct was a significant goal of the study, since currently, several of the existing drain inlets are not gated, and sediment-laden floodwater flows directly into the aqueduct with little detention and decanting. It is widely understood that increasing flood storage and detention of this floodwater prior to releasing it into the California Aqueduct would provide a significant benefit to water quality in the aqueduct. In 2013, cultural studies were completed with a finding of no adverse effect, and the hoist stem at the gated box inlet at Milepost 136 (Laguna Avenue) was repaired. By the end of 2013, DWR Division of Engineering's design plans for this project were 90 percent complete .

## **Repairs, Modifications, and Inspections**

DWR continually monitors all SWP facilities and performs repairs, modifications, and inspections as necessary to ensure safe, reliable water delivery.

### **Inspections**

In 2013, Condition Assessment Program inspections were performed on more than 28 different reaches of the SWP for more than 291 miles of canals and pipelines. To aid in maintenance efforts, check structures, culverts, drain inlets, overchutes, turn-ins, turnouts, gauging stations, recreational facilities, and utility crossings along the canal were inspected and rated.

### **Oroville Field Division**

In the Oroville Field Division, features that were inspected included the Richvale Canal, Western Canal, and Thermalito tailrace and their associated structures. Gauging stations that were inspected included the Feather River Fish Barrier, Mill Sap Bar, Pacific Gas & Electric Company, Sutter Buttes outlet, and Thermalito Afterbay outlet.

Recreational facilities that were inspected included the Bruce Wallace Memorial Field, Diversion Pool Day Use Area, and the Feather River Fish Hatchery and overlook.

Boat launches that were inspected included Dark Canyon, Enterprise, Foreman Creek, Larkin Road, Lime Saddle, Loafer Creek, Monument Hill, Nelson Bar, Stringtown, North Thermalito Forebay, South Thermalito Forebay, Vinton Gulch, and Wilbur Road.

During 2013, the Thermalito Forebay Dam bypass radial gate was inspected with rope access methods. The results of the inspection led to the replacement of wire hoist ropes and connection hardware, seal plate adjustments, bolt replacements, and rebalancing of the gate.

Additional riprap was added to the left bank of the Robie Thermalito Pumping-Generating Plant's tailrace channel due to riprap degradation from large releases from the bypass radial gate. Dive inspections of the Thermalito Forebay bypass gate's approach bay, spillway, and the plant's tailrace apron were performed. Bathymetry of the tailrace channel was also performed. The inspections and bathymetry verified the satisfactory condition of these features.

O&M's Dam Safety Branch and Oroville Field Division conducted post-earthquake dam safety inspections of Antelope, Frenchman, and Grizzly Valley dams after the May 23, 2013, magnitude 5.7 earthquake located 6.8 miles northwest of Greenville, California. The inspections revealed no damage to the dams or their appurtenant structures.

### ***Delta Field Division***

In the Delta Field Division, features along 51 miles of the California Aqueduct were inspected, including portions of the South Bay Aqueduct. Two hundred twenty-nine California Aqueduct features were inspected spanning 5 repayment reaches and 13 aqueduct pools.

### ***San Luis Field Division***

In the San Luis Field Division, features along 122 miles of the California Aqueduct were inspected, including Panoche Creek Siphon (Barrel No.1). Five hundred twenty-six California Aqueduct features were inspected, spanning 7 repayment reaches and 13 aqueduct pools.

### ***San Joaquin Field Division***

In the San Joaquin Field Division, features along 54 miles of the California Aqueduct were inspected, including portions of the Coastal Branch. Two hundred four California Aqueduct features were inspected, spanning 7 repayment reaches and 15 aqueduct pools.

### ***Southern Field Division***

In the Southern Field Division, features along 64 miles of the West and East branches of the California Aqueduct were inspected, including a portion of the Santa Ana Valley Pipeline, Ritter Siphon, Leona Siphon, and the Gorman Creek Improvement Channel. Three hundred eighty California Aqueduct features were inspected, spanning 10 repayment reaches and 20 aqueduct pools.

### ***Other Inspections***

In addition to the conveyance facilities, 87 bridges were inspected as part of a regularly scheduled maintenance program, along with 150 roofs of SWP buildings. SWP access roads are routinely inspected by staff in each field division as they traverse the hundreds of miles of paved and unpaved roadways daily. Staff reports of distressed and problematic areas result in road repair projects. In 2013, approximately 50 miles and 10.5 acres of pumping plant compound and parking areas were repaired using seal and pave contracts.

Condition Assessment Program inspections are scheduled annually, biennially, or every 5 years. Future inspections will aim to identify trends in maintenance and aging of the SWP.

### ***Repairs***

#### ***Dos Amigos Pumping Plant***

In January 2013, a sinkhole located at the Siphon Breaker Control House Building at the Dos Amigos Pumping Plant in the San Luis Field Division triggered subsurface investigation and testing. The repair of suspected leaking pipeline joints in all six discharge pipelines was done with WEKO seals where needed, on both upstream and downstream sides of the siphons. The remediation of soil around and underlying the pipelines at a transition joint and other areas located on the downstream side of the siphons was completed through fluid backfill grouting and compaction grouting.

### ***Cedar Springs Dam***

A rock slope protection repair was completed in February 2013 at Cedar Springs Dam. The repaired area was upstream of the dam's right groin, and the purpose of the repair was to restore the design slope of the nearby beached embankment area. The repair addressed a recommendation made by DSOD during an annual inspection.

### ***Clifton Court Forebay***

On July 8, 2013, Clifton Court Forebay Intake Structure Gate No. 2 failed and required retrieval from the reservoir. Emergency repair work to return Gate No. 2 to service continued through the remainder of the year under Specification No. 13-15. The subsequent forensic investigation identified the failure of the gate connecting link eyelet (due to wear and corrosion) as the triggering event. The trunnion anchor tendons failed shortly thereafter, allowing the inflow to detach the gate from the control structure.

## **Outages for Maintenance and Repair of Facilities**

Table 11-1 presents information, arranged chronologically, about significant scheduled and unscheduled outages at SWP pumping and power plants in 2013. The table includes information about incidents resulting in outages of 14 days or more.

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2013, by Month**

1 of 7

Month	Facility	Unit	Outage Description
January	Banks Pumping Plant	6	January 1 to February 1 for Condition Assessment Program inspection and hydraulic preventive maintenance; continued from October 15, 2012
	Banks Pumping Plant	8	January 2 to June 19 for water in lower guide bearing
	Banks Pumping Plant	10	January 1 to November 1 for discharge valve refurbishment; continued from May 4, 2012
	Barker Slough Pumping Plant	6	January 1 to December 31 for motor and pump refurbishment; continued from June 7, 2012
	Cordelia Pumping Plant	2	January 1 to January 31 for removing motor; continued from November 8, 2012
	South Bay Pumping Plant	3	January 1 to May 15 for motor install; continued from November 26, 2012
	South Bay Pumping Plant	5	January 15 to February 27 for repair of high-pitch noise
	South Bay Pumping Plant	9	January 1 to February 27 for motor removal and repair; continued from September 14, 2012
	South Bay Pumping Plant	10	January 1 to January 16 for motor/pump coupling and testing; continued from December 18, 2012
	South Bay Pumping Plant	12	January 1 to November 15 for pump removal; continued from October 31, 2012
	South Bay Pumping Plant	13	January 1 to June 4 for motor removal and replacement; continued from October 15, 2012
	Hyatt Powerplant	2	January 1 to June 20 for cold water rotary strainer repair; continued from April 1, 2010
	Hyatt Powerplant	5	January 1 to December 31 for thrust bearing restriction; continued from September 28, 2012
	Hyatt Powerplant	6	January 1 to July 25 for water leaking from turbine; continued from December 9, 2011
	Robie Thermalito Pumping-Generating Plant	1	January 1 to December 31 for fire damage; continued from November 22, 2012
	Robie Thermalito Pumping-Generating Plant	2	January 1 to December 31 for fire damage; continued from November 22, 2012
	Robie Thermalito Pumping-Generating Plant	3	January 1 to December 31 for fire damage; continued from November 22, 2012
	Robie Thermalito Pumping-Generating Plant	4	January 1 to December 31 for fire damage; continued from November 22, 2012
	Alamo Powerplant	1	January 1 to July 10 for governor oil pump failing to shut down; continued from May 23, 2012

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2013, by Month**

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Month	Facility	Unit	Outage Description
	Pearblossom Pumping Plant	2	January 1 to January 26 for amortisseur/rotor repair; continued from July 25, 2012
	Badger Hill Pumping Plant	2	January 1 to January 29 for 12X reverse overspeed
	Bluestone Pumping Plant	3	January 1 to September 13 for pump rebuild
	Devil's Den Pumping Plant	1	January 1 to June 20 for pump refurbishment
	Edmonston Pumping Plant	12	January 1 to December 11 for pump and motor refurbishment; continued from November 6, 2011
	Polonio Pass Pumping Plant	1	January 1 to December 31 for pump rebuild; continued from September 6, 2012
	Chrisman Pumping Plant	2	January 1 to December 31 for pump and motor refurbishment; continued from August 3, 2011
	Chrisman Pumping Plant	6	January 1 to February 26 for discharge line inspection; continued from December 3, 2012
	Chrisman Pumping Plant	7	January 1 to February 26 for discharge line inspection; continued from December 3, 2012
	Teerink Pumping Plant	1	January 1 to December 31 for KYA transformer refurbishment; continued from November 5, 2012
	Teerink Pumping Plant	2	January 1 to July 9 for KYA transformer refurbishment; continued from November 5, 2012
	Teerink Pumping Plant	3	January 1 to July 9 for KYA transformer refurbishment; continued from November 5, 2012
	Teerink Pumping Plant	4	January 1 to May 14 for KYA transformer refurbishment; continued from November 5, 2012
	Teerink Pumping Plant	5	January 1 to May 13 for KYA transformer refurbishment; continued from November 5, 2012
	Dos Amigos Pumping Plant	4	January 4 to April 17 for discharge pipe leaking
	Dos Amigos Pumping Plant	5	January 1 to February 28 for motor guide bearing; continued from July 6, 2012
	Giannelli Pumping-Generating Plant	1	January 1 to December 31 for annual pump and motor refurbishment; continued from September 6, 2011
	Giannelli Pumping-Generating Plant	5	January 1 to May 7 for unit overhaul
	Giannelli Pumping-Generating Plant	6	January 1 to May 7 for unit overhaul
	Giannelli Pumping-Generating Plant	7	January 1 to May 3 for head cover leakage
	Pine Flat Powerplant	1	January 1 to June 1 for penstock #1 excavation work; continued from December 1, 2012



**Table 11-1 Outages for Maintenance and Repair of Facilities in 2013, by Month**

3 of 7

Month	Facility	Unit	Outage Description
	Pine Flat Powerplant	2	January 1 to March 4 for annual switchyard maintenance; continued from October 29, 2012
	Pine Flat Powerplant	3	January 1 to March 4 for annual switchyard maintenance; continued from October 29, 2012
February	Banks Pumping Plant	4	February 28 to April 4 for upper seal repair
	Cordelia Pumping Plant	1	February 8 to April 5 for pipeline and reservoir work
	Cordelia Pumping Plant	2	February 8 to April 5 for pipeline and reservoir work
	Cordelia Pumping Plant	3	February 8 to April 5 for pipeline and reservoir repairs
	Cordelia Pumping Plant	4	February 8 to April 5 for pipeline and reservoir repairs
	Crafton Hills Pump Station	1	February 4 to March 29 for EBX pipeline outage
	Crafton Hills Pump Station	2	February 4 to March 29 for EBX pipeline outage
	Crafton Hills Pump Station	3	February 4 to March 29 for EBX pipeline outage
	Crafton Hills Pump Station	4	February 4 to March 29 for EBX pipeline outage
	Cherry Valley Pump Station	1	February 4 to March 29 for EBX pipeline outage
	Cherry Valley Pump Station	2	February 4 to March 29 for EBX pipeline outage
	Cherry Valley Pump Station	3	February 4 to March 29 for EBX pipeline outage
	Greenspot Pump Station	1	February 4 to March 25 for EBX pipeline outage
	Greenspot Pump Station	2	February 4 to March 25 for EBX pipeline outage
	Greenspot Pump Station	3	February 4 to March 25 for EBX pipeline outage
	Greenspot Pump Station	4	February 4 to March 25 for EBX pipeline outage
	Greenspot Pump Station	5	February 4 to March 27 for EBX pipeline outage
	Mojave Siphon Powerplant	3	February 6 to March 7 for check 66 Trash Rack
	Pearblossom Pumping Plant	5	February 4 to February 28 for Condition Assessment Program inspection
	Edmonston Pumping Plant	3	February 11 to February 27 for Condition Assessment Program inspection
	Edmonston Pumping Plant	10	February 25 to April 4 for troubleshooting 64f ground
	Dos Amigos Pumping Plant	3	February 28 to April 23 for discharge pipe leaking
	Dos Amigos Pumping Plant	5	February 28 to June 5 for leaking discharge line
	Dos Amigos Pumping Plant	6	February 28 to May 1 for leaking discharge line

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2013, by Month**

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Month	Facility	Unit	Outage Description	
March	Cordelia Pumping Plant	2	March 29 to May 1 for overcurrent relay trip	
	South Bay Pumping Plant	1	March 4 to March 21 for mechanical seal leak repair	
	South Bay Pumping Plant	1	March 26 to December 31 for unit 1 discharge valve stuck open-discharge line drained	
	South Bay Pumping Plant	2	March 26 to April 19 for unit 1 discharge valve stuck open-discharge line drained	
	South Bay Pumping Plant	4	March 26 to April 19 for unit 1 discharge valve stuck open-discharge line drained.	
	Devil Canyon Powerplant	1	March 4 to March 29 for Condition Assessment Program inspection	
	Bluestone Pumping Plant	5	March 18 to April 19 for 86M lockout	
	Chrisman Pumping Plant	4	March 5 to April 29 for discharge line #2 repair	
	Chrisman Pumping Plant	5	March 5 to April 29 for discharge line #2 repair	
April	Banks Pumping Plant	4	April 4 to April 26 for drain valve leak repair	
	Banks Pumping Plant	11	April 26 to August 21 for BA10 bumphead removal	
	Hyatt Powerplant	1	April 29 to May 25 for penstock #1 for HY2 assembly	
	Hyatt Powerplant	3	April 29 to May 25 for penstock #1 for HY2 assembly	
	Mojave Siphon Powerplant	3	April 10 to May 10 for Condition Assessment Program inspection	
	Pearblossom Pumping Plant	6	April 2 to May 17 for Condition Assessment Program inspection	
	Warne Powerplant	2	April 15 to May 10 for KY2 annual Condition Assessment Program inspection	
	Buena Vista Pumping Plant	1	April 11 to May 1 for installation of new power circuit breaker	
	Buena Vista Pumping Plant	4	April 3 to December 31 for overhaul	
	Chrisman Pumping Plant	1	April 2 to May 20 for discharge line #1 repair	
	Chrisman Pumping Plant	3	April 2 to May 20 for discharge line #1 repair	
	Chrisman Pumping Plant	6	April 30 to May 15 for discharge line #3 work	
	Chrisman Pumping Plant	7	April 30 to May 15 for discharge line #3 work	
	Dos Amigos Pumping Plant	4	April 17 to June 7 for discharge pipe leaking	
	May	Cordelia Pumping Plant	2	May 2 to August 29 for failure to start
		South Bay Pumping Plant	3	May 15 to December 31 for discharge valve replacement
Pearblossom Pumping Plant		4	May 13 to June 6 for Condition Assessment Program inspection	

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2013, by Month**

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Month	Facility	Unit	Outage Description
	Warne Powerplant	1	May 13 to June 10 for biennial preventive maintenance and Condition Assessment Program inspection
	Buena Vista Pumping Plant	1	May 6 to May 24 for Condition Assessment Program inspection
	Edmonston Pumping Plant	14	May 6 to May 28 for K8A transformer annual preventive maintenance
	Chrisman Pumping Plant	8	May 15 to May 31 for discharge line #4 repair
	Chrisman Pumping Plant	9	May 15 to May 31 for automatic voltage regulator out of service
	Giannelli Pumping-Generating Plant	2	May 14 to December 4 for penstock #1 out for bumphead
	Giannelli Pumping-Generating Plant	7	May 23 to December 31 for turbine pit flooding
June	Barker Slough Pumping Plant	3	June 30 to July 25 for failure to start
	Hyatt Powerplant	4	June 4 to June 22 for work on penstock #2
	Devil Canyon Powerplant	4	June 6 to June 26 for governor and wheel pit Condition Assessment Program inspection
	Bluestone Pumping Plant	2	June 5 to July 2 for KYA Doble test and breaker problem
	Dos Amigos Pumping Plant	1	June 7 to June 28 for installation of grout monitoring equipment
July	Reid Gardner Powerplant	4	July 19 to December 31 for separated from State service: contract expired
	Mojave Siphon Powerplant	2	July 8 to August 2 for governor caps
	Oso Pumping Plant	8	July 6 to November 5 for oil leaking from motor housing
	Bluestone Pumping Plant	1	July 1 to December 31 for failure to synchronize to grid
	Edmonston Pumping Plant	5	July 22 to August 12 for discharge valve lead abatement and brush preventive maintenance
August	South Bay Pumping Plant	11	August 23 to December 30 for realignment and vibration test
	Alamo Powerplant	1	August 7 to August 29 for water intrusion in thrust tub
	Buena Vista Pumping Plant	5	August 5 to December 31 for stator rewind/rotor replacement
	Edmonston Pumping Plant	7	August 13 to August 28 for discharge valve lead abatement
	Edmonston Pumping Plant	9	August 27 to September 12 for lead abatement
September	Banks Pumping Plant	4	September 19 to October 17 for breaker rack problem
	Banks Pumping Plant	5	September 23 to October 17 for 87M wiring research
	Devil Canyon Powerplant	3	September 9 to September 27 for unit cap
	Devil Canyon Powerplant	4	September 27 to November 7 for motor housing water leak

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2013, by Month**

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Month	Facility	Unit	Outage Description
	Pearblossom Pumping Plant	3	September 3 to September 26 for Condition Assessment Program inspection
	Edmonston Pumping Plant	11	September 3 to September 18 for lead abatement
	Chrisman Pumping Plant	9	September 9 to December 31 for packing inspection
	Teerink Pumping Plant	9	September 3 to October 1 for mechanical repairs
	Dos Amigos Pumping Plant	1	September 21 to October 25 for 64 relay work
	Dos Amigos Pumping Plant	6	September 3 to December 31 for biannual preventive maintenance
October	Polonio Pass Pumping Plant	6	October 29 to December 6 for excessive pump bearing noise and high temperature
November	Banks Pumping Plant	4	November 5 to December 31 for reverse over speed discharge valve closed
	Banks Pumping Plant	10	November 9 to November 25 for discharge valve failed to open
	Devil Canyon Powerplant	2	November 13 to December 13 for annual Condition Assessment Program inspection
	Oso Pumping Plant	3	November 4 to December 31 for refurbish/overhaul/rewind and discharge valve work
	Oso Pumping Plant	4	November 4 to December 31 for refurbish/overhaul/rewind and discharge valve work
	Oso Pumping Plant	5	November 4 to December 31 for refurbish/overhaul/rewind and discharge valve work
	Oso Pumping Plant	6	November 4 to December 31 for refurbish/overhaul/rewind and discharge valve work
	Badger Hill Pumping Plant	1	November 2 to November 22 for trash rack replacement
	Badger Hill Pumping Plant	2	November 2 to November 22 for trash rack replacement
	Badger Hill Pumping Plant	3	November 2 to November 22 for trash rack replacement
	Badger Hill Pumping Plant	4	November 2 to November 22 for trash rack replacement
	Badger Hill Pumping Plant	5	November 2 to November 22 for trash rack replacement
	Badger Hill Pumping Plant	6	November 2 to November 22 for trash rack replacement
	Bluestone Pumping Plant	2	November 2 to November 24 for Coastal Aqueduct outage
	Bluestone Pumping Plant	3	November 2 to November 24 for Coastal Aqueduct outage
	Bluestone Pumping Plant	4	November 2 to November 24 for Coastal Aqueduct outage
	Bluestone Pumping Plant	5	November 2 to November 24 for Coastal Aqueduct outage

**Table 11-1 Outages for Maintenance and Repair of Facilities in 2013, by Month**

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Month	Facility	Unit	Outage Description
	Bluestone Pumping Plant	6	November 2 to November 24 for Coastal Aqueduct outage
	Devil's Den Pumping Plant	1	November 2 to November 22 for Coastal Aqueduct outage
	Devil's Den Pumping Plant	2	November 2 to November 23 for Coastal Aqueduct outage
	Devil's Den Pumping Plant	3	November 2 to November 23 for Coastal Aqueduct outage
	Devil's Den Pumping Plant	4	November 2 to November 25 for Coastal Aqueduct outage
	Devil's Den Pumping Plant	5	November 2 to December 6 for Coastal Aqueduct outage
	Devil's Den Pumping Plant	6	November 2 to November 26 for Coastal Aqueduct outage
	Polonio Pass Pumping Plant	2	November 2 to November 24 for Coastal Aqueduct outage
	Polonio Pass Pumping Plant	3	November 2 to November 27 for Coastal Aqueduct outage
	Polonio Pass Pumping Plant	4	November 2 to November 24 for Coastal Aqueduct outage
	Polonio Pass Pumping Plant	5	November 2 to November 24 for Coastal Aqueduct outage
December	Banks Pumping Plant	8	December 12 to December 31 for Megger rotor and continuity test
	Hyatt Powerplant	1	December 2 to December 31 for replacing turbine guide and system maintenance
	Mojave Siphon Powerplant	1	December 1 to December 26 for dive for slide gate stop log
	Mojave Siphon Powerplant	2	December 1 to December 21 for dive for slide gate stop log and inspecting/repairing discharge valves
	Mojave Siphon Powerplant	3	December 1 to December 24 for dive for slide gate stop log and inspecting/repairing discharge valves
	Pearblossom Pumping Plant	1	December 2 to December 19 for inspecting/repairing discharge line #1
	Pearblossom Pumping Plant	2	December 2 to December 19 for inspecting/repairing discharge line #1
	Pearblossom Pumping Plant	3	December 2 to December 19 for inspecting/repairing discharge line #1







## **Chapter 12**

# **Engineering, Construction, and Real Estate**

*The Perris Dam Remediation Project includes engineering analysis of the left reach of the embankment dam and foundation.*

## Significant Events in 2013

In 2013, engineering, construction, and real estate work to enhance, expand, repair, and protect the State Water Project (SWP) and other facilities within the State continued. Significant projects included the South Bay Aqueduct (SBA) enlargement, expansion of the South Bay Pumping Plant, Perris Dam remediation, and the East Branch Extension Phase I Improvements and Phase II projects.

The Delta Habitat Conservation and Conveyance Program (DHCCP) continued with studies in 2013 to assess potential habitat restoration and water conveyance options.

*Information for this chapter was provided by the Division of Engineering.*

Initial construction of the State Water Project (SWP) facilities began in 1957 with the relocation of the Western Pacific Railroad facilities and Highway 70 near the City of Oroville to accommodate the SWP Oroville Facilities. Oroville Dam was constructed between 1961 and 1967. Construction of the South Bay Aqueduct (SBA) facilities started in 1960, and the first SWP water was delivered through the SBA in 1962 to serve Alameda County.

In 1963, work began on the California Aqueduct, and by 1968, the SWP was delivering water to long-term contractors in the San Joaquin Valley to the foot of the Tehachapi Mountains. By 1973, with the completion of Edmonston Pumping Plant at the foot of the Tehachapi Mountains and other East Branch conveyance facilities, the SWP was delivering water to Lake Perris at the southernmost point in Riverside County.

Other water deliveries took place as follows:

- 1968—the first SWP water was delivered through the first phase facilities of the North Bay Aqueduct and through the first phase facilities of the Coastal Branch;
- 1974—the first SWP water was delivered through the West Branch facilities to Los Angeles County;
- 1988—SWP water was delivered through the second phase facilities of the North Bay Aqueduct to Solano County; and
- 1997—SWP water was delivered through the second phase facilities of the Coastal Branch Aqueduct to San Luis Obispo and Santa Barbara counties.

Prior to the completion of the initial facilities in 1973, work began on the Upper Feather River facilities to supply local water, recreation, and fish enhancement. Power plants, additional pumping units, and turbine-generators that had previously been deferred were built to ensure water quality and fish enhancement in the Delta.

From 1974 through 2013, design and construction activities included repairing concrete lining failures or potential failures of the canal system and concrete pipeline sections, replacing equipment components of existing facilities, enlarging or extending aqueduct reaches, refurbishing pump-turbine units, and adding pumps and motors to existing facilities. Specific projects included constructing the Devil Canyon Second Afterbay, constructing Phase II of the Coastal Branch, extending the SWP through the East Branch Extension to the San Geronio Pass service area in San Bernardino and Riverside counties with enlargements and expansions in later years, enlarging the SBA, remediating earthquake safety issues at Perris Dam, and assessing potential habitat restoration and water conveyance options in the Delta.

## Design Activities

In 2013, work to enhance, expand, repair, and protect SWP water delivery facilities continued. Engineering activities supported more efficient water deliveries within the confines of legal and environmental constraints and power availability. Significant projects included Perris Dam remediation design and preliminary and final designs for the East Branch Extension Phase II projects. Table 12-1 (at the end of the chapter) provides a list of completed and ongoing design work that was undertaken in 2013.

The Department of Water Resources (DWR), Division of Engineering (DOE) continued to design projects for development into the



construction phase, including awarding construction contracts. DOE staff worked with many DWR divisions and offices, as well as local, State, and federal agencies. DOE staff prepared preliminary designs and estimates; developed and administered construction contract documents and carried out construction projects; and conducted special studies of dams, canal embankments, and other SWP facilities.

Study and design activities continued from previous reporting periods, or initiated in 2013, included the following:

- Oroville, Thermalito, and Pyramid dams radial gate structural re-evaluation—design;
- Sherman and Twitchell islands fish screens—final design;
- North Bay Aqueduct alternate intake—study;
- Sisk Dam seismic re-evaluation—study;
- Edmonston, Chrisman, Teerink, and Buena Vista pumping plants—septic tank replacement—design;
- San Joaquin Field Division—emergency generator replacement—design;
- East Branch Enlargement, Phase II—preliminary design and environmental documents;
- Perris Dam emergency release extension—design;
- Los Robles Bridge seismic analysis—design; and
- Clifton Court radial gate repairs—design.

In 2013, DOE staff completed the following designs:

- Edmonston, Chrisman, Teerink, and Buena Vista pumping plants—furnish and install annunciator panels;
- Los Banos Creek Detention Dam—recoat outlet works piping;

- Gorman Creek Improvement Channel south of Orwin Way—pipeline installation and channel repairs;
- Delta and San Luis field divisions—seal and pave roads and parking areas;
- San Joaquin Field Division—cathodic protection and insulated coupling vaults;
- San Joaquin Field Division, Badger Hill Pipeline—repair;
- Antelope Valley-East Kern Water Agency—turnout replacement;
- East Branch Extension, Phase II—furnish 5 kilovolt (kV) switchgear, Citrus and Crafton Hill pump stations;
- Perris Dam—embankment remediation;
- SWP—copper communication cable and voice and data equipment monitoring, testing, and repair.

## Environmental Activities

Since the inception of the SWP, environmental issues have increased in magnitude with the enactment of numerous federal and State laws. DWR has complied with these laws by seeking appropriate permits, preparing environmental compliance documents, and incorporating environmental requirements and conditions into the design and execution of construction projects. Environmental scientists work with design engineers to produce projects that meet SWP objectives while having the least impact possible on the environment. Construction contract specifications and plans are reviewed and modified with environmental compliance requirements and sensitive resource protection needs in mind. Ongoing construction activities are monitored to ensure compliance with requirements outlined in environmental permits for each contract.

## Delta Habitat Conservation and Conveyance Program

In 2008, as a result of calls by the Governor and Legislature to protect the Delta, the



Delta Habitat Conservation and Conveyance Program (DHCCP) was established, prompting studies to assess potential habitat restoration and water conveyance options. The DHCCP is conducting an environmental review of the Bay Delta Conservation Plan (BDCP). The lead agencies preparing the joint draft environmental impact report/ environmental impact statement (EIR/EIS) for the BDCP are DWR, the California Department of Fish and Wildlife, the Bureau of Reclamation (Reclamation), the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service.

During 2013, the DHCCP continued to:

- support processes and alternative analyses needed to obtain permits required under Clean Water Act Sections 401(b)(1) and 404 and Title 33 U.S.C. 408 Navigation and Navigable Waters;
- maintain, update, and manage a database of questions, comments, and information requests related to the DHCCP and BDCP EIR/EIS;
- update the BDCP website and coordinate with other Delta-related programs regarding the DHCCP environmental and engineering process;
- develop a strategy to communicate DHCCP activities to others; and
- respond to comments received from State and federal agencies on the administrative draft EIR/EIS and BDCP.

The environmental component of the DHCCP includes environmental impact analysis, California Environmental Quality Act and National Environmental Policy Act document preparation, environmental surveys, mitigation, and all associated permitting requirements. Approval of the BDCP, its EIR/EIS, and associated documents is essential to obtaining required permits. The BDCP and corresponding EIR/EIS contain more than 34,000 pages and are

the culmination of 7 years of analysis and hundreds of public meetings.

In 2013, the DHCCP accomplished the following:

- completed and released the public draft of the BDCP and its EIR/EIS documents, and posted both documents to the website for public review in December 2013;
- completed and released conceptual engineering reports for BDCP Conservation Measure 1 describing the east, west, and tunnel alternatives for water conveyance;
- coordinated and executed a BDCP outreach tour throughout the Central Valley, Los Angeles, and San Diego focused on providing project briefings and engaging in dialogue about the project with journalists, elected officials, labor interests, and agricultural interests;
- held informational meetings and presentations on the BDCP for the tribal communities, trade organizations, Delta landowners, Stone Lakes National Wildlife Refuge, Delta Conservancy, Delta Vision Forum, Delta counties, and State legislators' staff;
- collected, reviewed, and provided information for several Public Records Act requests;
- completed a draft geotechnical data report documenting the data collected from field exploration and laboratory tests from 2009 through 2012; and
- completed draft DHCCP design standards.

More information can be found on the BDCP website.

## Construction Activities

DOE worked on 58 construction contracts in 2013. Projects included fire clean-up, pipeline repair, control systems upgrades, and recreation and maintenance facility

improvements at dam and reservoir sites. Table 12-2 (at the end of the chapter) shows information for construction contracts. Resolution of contract claims may extend the actual contract closeout beyond the completion or acceptance date.

## **SWP—General**

### ***SWP Supervisory Control and Data Acquisition System***

A contract (Specification No. 08-12) to replace portions of the aging SWP supervisory control and data acquisition system began in May 2009 and continued in 2013. This contract will furnish and install 176 controller assemblies for the replacement of remote terminal units located throughout the SWP and will furnish 16 controller assemblies for Devil Canyon Powerplant and DWR's development lab at the Joint Operations Center. The controller assemblies are being put together from components furnished by the contractor (programmable logic controllers, sequence-of-event recorders, fiber patch panels, modems, and other equipment). Work is scheduled to be completed in January 2015. Acceptance is expected in May 2015.

## **Oroville Division**

### ***Brad B. Freeman Bike Trail Realignment***

Realignment of the bike trail (Specification No. 13-03) in the Lake Oroville State Recreation Area began in May 2013. The work included rock-fill delivered by barges, installation of corrugated metal pipe, chain-link fencing with gates, and aggregate base for the bike path. Work was completed in July 2013. Acceptance is expected in March 2014.

### ***Robie Thermalito Pumping-Generating Plant—Cleanup and Restoration Phase I***

Initial cleanup of the Robie Thermalito Pumping-Generating Plant (Specification No. 13-16) began in October 2013. The work involves cleaning and repairing all fire-

impacted equipment; installation of new roll-up doors; procedure testing of essential systems; and a new heating, ventilation, and air-conditioning system. Work also includes repair of spalled concrete, roof, and skylights; cleaning electrical components in the switchyard; and other cleanup as deemed necessary by the engineer. Work is scheduled to be completed in October 2014. Acceptance is expected in January 2015.

### ***Oroville Operations and Maintenance Center***

A new garage shop was constructed and site work was performed for a temporary building under a contract (Specification No. 11-03) that began in August 2011. This work is part of the Oroville Facilities Relicensing project. Work was completed in September 2013. Acceptance is expected in March 2014.

## **South Bay Aqueduct**

### ***SBA Enlargement and Improvement***

The SBA Enlargement and Improvement projects will restore the first 16.38 miles of the SBA to the 300 cubic feet per second (cfs) design flow and increase the design capacity by up to 130 cfs. This work will enlarge the South Bay Pumping Plant to accommodate four additional 45 cfs units, construct a third discharge line, construct Dyer Reservoir, enlarge the canals, and modify associated structures. Projects are described below.

**Canal Modifications.** Various modifications were performed along Dyer Canal, Livermore Canal, Alameda Canal, and Del Valle Pipeline under a contract that began in October 2010 (Specification No. 09-16). Work included raising the canal lining, canal embankment, and operating roads; removing, modifying, installing, and constructing various structures, including overchutes, inlets, pipes, bridges, trash racks, siphons, check structures, water-level measurement systems, radial gates, motors, control systems, flowmeters, and valves; and

raising/refurbishing Patterson Reservoir. Work was completed in April 2012. Acceptance is expected in June 2014.

**Siphon and Check Structure Modifications.** A contract (Specification No. 08-21) to fabricate 10 radial gates, radial gate hoist assemblies (with associated control systems), and electric actuators for SBA check structures began in January 2009. Also included in this contract are the fabrication of stoplogs and stoplog storage racks, one trash removal system for Dyer-Altamont Check No. 2, and two trash removal systems for Del Valle Check No. 7. Work was completed in June 2011. Acceptance is expected in January 2014.

**Transmission Line and Modifications to Banks Switchyard.** Construction of a new 69 kV transmission line from South Bay Pumping Plant to Banks Pumping Plant and modifications to the Banks Switchyard began in October 2009 (Specification No. 09-06). The new transmission line will increase the South Bay Pumping Plant power supply capacity and reliability while decreasing the unit cost of power. The Banks Switchyard modifications will allow a power step-down from 230 kV to 69 kV. Project work also includes installation of DWR-furnished transformers and equipment; furnishing and installing prefabricated control buildings, 13.8 kV distribution line poles and equipment, a new substation, and switchgear and equipment; and removing and disposing of existing 13.8 kV and 5 kV power distribution lines. Work was completed in November 2012. Acceptance is expected in April 2014.

**South Bay Pumping Plant.** The following contracts for the SBA Enlargement project at South Bay Pumping Plant continued throughout 2013.

Specification No. 04-05: furnish 45 cfs pump and motor units for Unit Nos. 10 through 13 and one spare pump and motor. Work began

in November 2004 and continued throughout 2013. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.

Specification No. 04-20: furnish valves, actuators, and hydraulic power units. Work began in May 2005. The equipment was furnished in June 2007. Repairs to the butterfly valves were added to this contract by change order. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.

Specification No. 05-10: furnish switchyard equipment. Work began in September 2005 and was completed in 2012. Additional work added by a contract change order furnished equipment for the Banks Switchyard expansion to accommodate the new 69 kV transmission line from Banks Pumping Plant to South Bay Pumping Plant in 2013. Acceptance is expected in February 2014.

Specification No. 05-05: furnish 5 kV switchgear. Work began in October 2005 and is expected to be completed in 2014. Acceptance is expected in June 2014.

Specification No. 06-04: enlarge pumping plant initial facilities. Work began in August 2006 and is expected to be completed in 2014. Acceptance is expected in June 2014.

Specification No. 07-02: furnish power transformers. Work began in April 2007 and was completed in September 2008. The work was accepted in January 2013.

Specification No. 07-18: added work included repairs to a water system pipeline adjacent to Banks Pumping Plant. Work began in December 2007. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.

**Surge Tanks.** Work to seismically retrofit Surge Tank Nos. 1 and 2 (Specification No. 11-11) began in October 2011. Work

included modifying existing footings to add post-tensioned rock anchors, replacing steel pipe and sleeve couplings, and adding steel cladding at the existing surge tanks. Additionally, reinstallation/replacement of cross connection piping, earthwork, electrical work, application of coatings, abatement of lead-based paint, and installation of miscellaneous metalwork such as grating, ladders, cages, handrails, and hatches was performed. Work was completed in October 2012 and accepted in February 2013.

**Del Valle Dam.** Bulkhead installation and removal (Specification No. 12-14) began in October 2012. Original contract work included labor, materials and construction equipment, hauling of construction equipment for installation and removal of a DWR-furnished bulkhead gate, repairing cracks inside the flood control outlet works tunnel, applying coatings to bulkhead gate and flood control outlet works tunnel slide gates, painting station markings on the inside of the Del Valle spillway tunnel, and installing a metal walkway. In addition to the original contract work, additional tasks were performed under change order. These tasks included:

- urgent repair of a leak on the SBA Pipeline at Mileposts 38.90, 33.83, and 35.34;
- Thermalito Powerplant recovery efforts;
- Clifton Court Forebay gate repair;
- open channel flowmeter installation at Dyer Reservoir;
- Del Valle floodgate repair;
- Hyatt Powerplant clean up; and
- furnishing WEKO-SEALs (internal joint seals).

Work was completed in December 2012. Acceptance is expected in January 2014.

## North San Joaquin Division

### *Skinner Fish Science Building*

The Delta Fish Survival Improvements Program (Specification No. 12-15) began in December 2012. Work consisted of construction of a cold-formed steel frame building with restroom, office space, and break room facilities. The project included the demolition of existing items, as specified:

- asphalt concrete paving;
- concrete and reinforcing steel;
- concrete curb and gutter;
- chain-link fencing;
- traffic gates;
- metal beam guardrail; and
- cathodic protection.

Work was completed in September 2013. Acceptance is expected in May 2014.

### *Skinner Fish Facility*

Work began in July 2013 (Specification No. 13-15) to remove, clean, and repair three stoplogs at the Skinner Fish Facility. It also includes the removal, cleaning, and repair of five loading gates. The repairs, at the discretion of the engineer, are scheduled to be completed in January 2014. Acceptance is expected in March 2014.

## San Luis Division

### *Dos Amigos Pumping Plant—Trash Rake System*

A contract (Specification No. 08-06) to design, manufacture, deliver, install, and test one complete automatic trash rake system and to manufacture, deliver, and install trash racks began in January 2009. Work was completed in November 2012 and accepted in February 2013.



### ***Gianelli Pumping-Generating Plant—Heating, Ventilation, and Air-Conditioning System Replacement***

Heating, ventilation, and air-conditioning systems were replaced under a contract (Specification No. 10-22) that began in April 2011. Work was completed in January 2013 and accepted in March 2013.

### ***Chowchilla Canal Bypass Structure—Radial Gate Modifications***

Radial gate modifications (Specification No. 12-17) began in September 2012. Work included stoplog and sandbag removal, coatings, paint and coating removal, and radial gate modifications. Work was completed in November 2012 and accepted in February 2013.

### ***Los Banos Creek Detention Dam—Outlet Works Piping***

Work began in July 2013 (Specification No. 13-04) at the Los Banos Creek Detention Dam to recoat 525 feet of the discharge pipe. The work involves stripping and recoating the interior and exterior of the pipe, the release and discharge slide gates, ladder, handrail, bulkhead gate, and various other piping. The work is scheduled to be completed in February 2014. Acceptance is expected in October 2014.

### ***Delta and San Luis Field Divisions—Seal and Pave Roads and Parking Areas***

Work began in July 2013 (Specification No. 13-06) to seal and pave roads and parking areas in Alameda, Contra Costa, Stanislaus, Santa Clara, Merced, Kings, and Fresno counties. Work was completed in November 2013. Acceptance is expected in June 2014.

## **Tehachapi Division**

### ***Edmonston Pumping Plant—Pump Unit Replacement***

A contract to replace pump Units W2, W4, W6, and W8 (Specification No. 02-10) began in June 2003. Work was completed in March 2011. Delivery of additional spare parts was later added to the contract through a change order. Delivery and acceptance is expected in November 2015. Work consisted of:

- designing, fabricating, and testing a four-stage pump model and a single-stage pump model, and furnishing a pump model test program report;
- designing, manufacturing, delivering, storing, and installing four pumps to replace existing pumps;
- furnishing spare parts, auxiliary equipment, tools, and templates;
- applying coatings;
- providing liaison services; and
- furnishing additional spare parts requested via change order.

Under a contract (Specification No. 11-02) that began in June 2011, the contractor furnished and delivered spare parts for the seven Baldwin-Lima-Hamilton pumps and discharge valves at Edmonston Pumping Plant. Spare parts included labyrinth seals, shaft seals, casing and impeller wear rings, shaft sleeves, wear plates, valve seal rings and pistons, and patch bolts. Work was completed in February 2013 and accepted in June 2013.

### ***Edmonston Pumping Plant, Teerink Pumping Plant, and Control Buildings at Various Sites***

Roofing replacement (Specification No. 12-06) began in October 2012. The work includes removing and replacing the existing roof assemblies at Edmonston and Teerink pumping plants, Devil Canyon Penstock



Control Building, and 15 other control buildings. Work is scheduled to be completed in January 2014. Acceptance is expected in July 2014.

### ***Chrisman and Devil's Den Pumping Plants***

Site improvements (Specification No. 12-12) began in December 2012. The work included:

- repairing and coating water discharge pipe sleeve couplings and expansion joints;
- constructing temporary scaffolds with containment structures for sandblasting and cleaning the joints;
- removing sandblast dust and debris; and
- removing and replacing 160 feet of 12-inch diameter steel pipe.

Work was completed in June 2013. Acceptance is expected in July 2014.

### ***Gorman Creek Improvement Channel—Pipeline Installation and Channel Repairs***

Work on the Gorman Creek Improvement Channel, south of Orin Way (Specification No. 13-05), began in June 2013. The work involved removing 1,300 feet of the existing concrete channel and replacing it with 96-inch reinforced concrete pipe. The work also included a subsurface drainage system that will divert groundwater away from the channel. Work was completed in November 2013. Acceptance is expected in April 2014.

### ***East Branch Canal—Lining Repair***

This repair at Milepost 342.65 (Specification No. 13-10) began in July 2013. The work includes dewatering Pool 52, removing and repairing concrete panels, repairing and cleaning concrete, replacing bolt anchors and ladders, and repairing the access road. Work is scheduled to be completed in January 2014. Acceptance is expected in May 2014.

### ***Antelope Valley-East Kern Water Agency Turnout***

Construction of the Antelope Valley-East Kern turnout (Specification No. 13-11) began in August 2013. The work involves excavation, a temporary coffer dam, erosion control, steel pipe and fittings, concrete work, miscellaneous metal work, a trash rack, and backfilling. The contractor will perform demolition of the concrete liner and existing drainage ditch and removal of an existing asphalt concrete road. Work is scheduled to be completed in August 2014. Acceptance is expected in December 2014.

### ***Mojave Division Reaches 18A and 22B***

Work began in July 2010 to seal and pave roads and parking areas in the Southern Field Division (Specification No. 10-03). Work was completed in May 2012 and accepted in January 2013. Added work included:

- sealing and paving roads on the California Aqueduct, West Branch, Reach 29G (Los Alamos Campground Access Road, Gorman Creek Siphon, Pyramid Lake Road, and Vaquero Campground parking lot); and
- asbestos abatement and/or testing at Chrisman Pumping Plant.

### ***Cedar Springs Dam***

A contract to replace conduits and perform miscellaneous work at Cedar Springs Dam began in March 2011 (Specification No. 10-06). Work was completed in July 2012. Acceptance is expected in January 2014.

### ***Pearblossom Pumping Plant***

A contract to construct a new 20,000 square-foot Pearblossom Administration Building near Pearblossom Pumping Plant began in February 2011 (Specification No. 10-23). The new building, which was designed and will be operated to attain the Leadership

in Energy and Environmental Design gold rating, will be occupied by Southern Field Division staff and Lancaster Project Headquarters personnel. Work was completed in February 2013. Acceptance is expected in June 2014.

## Santa Ana Division

### *East Branch Extension Phase I Improvements*

The East Branch Extension Phase I improvements will provide additional operational flexibility, system reliability, and will reduce on-peak energy demands.

#### **Crafton Hills Reservoir Enlargement.**

A construction contract (Specification No. 11-12) to increase the reservoir's operating storage from 85 acre-feet (af) to approximately 225 af began in December 2011. The work includes an earthen embankment dam with rock slope protection, access roads, grouting, a seepage collection system, geotechnical instrumentation, and mechanical aerators. Work is scheduled to be completed in July 2014. Acceptance is expected in December 2014.

### *East Branch Extension Phase II*

Phase II of the East Branch Extension will complete the planned capacity increase for the East Branch Extension. Phase II will allow San Geronio Pass Water Agency to receive its maximum annual Table A water and allow the San Bernardino Valley Municipal Water District to increase its distribution system capacity to its Redlands and Yucaipa Valley service areas. Principal Phase II features include approximately 6 miles of new 72-inch and 66-inch diameter pipe, a new reservoir (Citrus Reservoir), a new 160 cfs pump station (Citrus Pump Station), expansion of the existing Crafton Hills Pump Station, and installation of an additional pump at Cherry Valley Pump Station.

**Citrus Reservoir.** Construction of Citrus Reservoir (Specification No. 12-02) began in June 2012. The work to construct the reservoir includes selective demolition, excavation, compacted soil liner, hydraulic asphalt concrete, inlet works, and environmental protection. Work is scheduled to be completed in 2014. Acceptance is expected in October 2014.

**Mentone Pipeline.** Construction of Mentone Pipeline (Specification No. 12-03) began in July 2012. The work to construct the pipeline includes approximately 2 miles of 72-inch buried steel pipe from Foothill Pump Station to Citrus Reservoir and approximately 3.5 miles of 66-inch buried steel pipe from Citrus Pump Station to Crafton Hills Pump Station. Work is scheduled to be completed in 2014. Acceptance is expected in December 2014.

**Valves.** Manufacturing, testing, and delivery of three energy dissipating valve assemblies (including electric actuators) for Citrus Reservoir began in September 2010 (Specification No. 10-10). The valves were delivered to the site in October 2012. Work was completed in March 2013. Acceptance is expected in June 2014.

Manufacturing, testing, and delivery of 14 ANSI (American National Standards Institute) butterfly valve assemblies with actuators for Citrus Pump Station, Crafton Hills Pump Station, and Cherry Valley Pump Station began in January 2011 (Specification No. 10-16). Work was completed in mid-2013. Acceptance is expected in June 2014.

Manufacturing, testing, and delivery of 12 AWWA (American Water Works Association) butterfly valve assemblies with actuators for Crafton Hills Pump Station, Cherry Valley Pump Station, and Mentone Pipeline began in February 2011 (Specification No. 10-17). Work was

completed in mid-2013. Acceptance is expected in June 2014.

Manufacturing, testing, and delivery of 12 ANSI ball valve assemblies with actuators and 4 actuators for Citrus Pump Station, Crafton Hills Pump Station, and Cherry Valley Pump Station began in January 2011 (Specification No. 10-18). The valves were delivered to the site in October 2012. Work was completed in July 2013. Acceptance is expected in June 2014.

**Transformers.** Transformers, accessories, tools, and spare parts will be manufactured, tested, and delivered for Citrus Pump Station under a contract (Specification No. 10-20) that began in March 2011. Work is scheduled to be completed in May 2015. Acceptance is expected in August 2015.

### ***Santa Ana Pipeline***

Construction to repair the Santa Ana Pipeline (Milepost 422.5) under Warm Creek (Specification No. 12-11) began in September 2012 and was completed in February 2013. The work was accepted in October 2013. Work included the repair of approximately 306 feet of 102.5-inch outside diameter steel liner inside prestressed concrete cylinder pipe.

### ***Crafton Hills and Citrus Pump Stations***

Construction on the Crafton Hills Pump Station expansion and Citrus Pump Station initial work (Specification No. 12-10) began in October 2012. Work includes construction of a prestressed concrete forebay water tank and pump station buildings; earthwork, shoring, and demolition; installation of a hydraulic asphalt concrete liner, steel pipe and appurtenances, DWR-furnished materials, and equipment; application of coatings; and testing. Work is scheduled to be completed in March 2014. Acceptance is expected in August 2014.

### ***Citrus, Crafton Hills, and Cherry Valley Pump Stations***

Work began in June 2013 on the contract (Specification No. 13-01) to provide equipment and the associated hardware (pumps, motors, variable frequency drives, and excitation systems) for the Citrus, Crafton Hills, and Cherry Valley pump stations. Work is scheduled to be completed in April 2015. Acceptance is expected in December 2015.

### ***West Branch***

#### ***West Branch (Reach 29G) General***

Under a change order to Specification No. 10-03, the following work began in July 2011:

- Los Alamos Campground Road: paving, striping, signage, shoulder repair, and drainage improvements;
- Gorman Creek Siphon: embankment erosion repair along the shoulder of Pyramid Lake Road; and
- Vaquero Parking Lot: refurbishment.

Work was completed in May 2012 and was accepted in February 2013.

### ***Oso Pumping Plant***

Work began in December 2007 to construct a 14,400 square-foot civil maintenance and mobile equipment building at Oso Pumping Plant (Specification No. 07-22). Work is scheduled to be completed in 2014. Acceptance is expected in June 2014; however, required added work, including a water treatment facility, may delay occupancy until late 2014.

## Construction Activities in Multiple Divisions

### *Delta Facilities, Suisun Marsh Facilities, and California Aqueduct*

Work on a multiyear (2010 through 2012) contract to install and remove seasonal temporary rock barriers in designated South Delta waterways, provide temporary agricultural pumping facilities, place and remove flashboards at the Suisun Marsh Salinity Control Structure, dredge areas of the South Delta, and remove aquatic weeds in Clifton Court Forebay and other Delta waterways began in March 2010 (Specification No. 09-21). Work was completed in February 2013 and accepted in October 2013. The temporary barriers are installed to enhance water levels and circulation in the South Delta for local agricultural diversion, to assist fish migration, and to gather hydraulic data for the design of future permanent barriers. Added work included:

- Delta Facilities: installation of a nonphysical barrier at Georgiana Slough;
- Delta Facilities: modifications to the fish release site at Curtis Landing;
- Delta Facilities: removal of trees at Horseshoe Bend;
- Suisun Marsh Facilities: urgent repairs to the Roaring River Slough levee;
- North San Joaquin Division: repair of cracks in the embankment of the California Aqueduct, vicinity of Milepost 88.96; and
- South San Joaquin Division: repair of a boil in the California Aqueduct, vicinity of Milepost 248.97, Reach 13B.

### *Temporary Rock Barriers 2013, 2014, and 2015*

This project (Specification No. 12-18) began in January 2013. Work includes two tasks related to the Temporary Barriers Program. The first task involves the removal of

temporary rock barriers and appurtenances at Middle River, Old River, and Grant Line Canal. Other first-task work includes temporary pumping facilities, dredging in the South Delta, removal of aquatic weeds in Clifton Court Forebay, installation of stone protection in the South Delta, and structural maintenance and repair at the Curtis Landing and Horseshoe Bend fish release sites. The second task includes furnishing, installing, and removing a nonphysical barrier at the head of Georgiana Slough and possibly other Delta divergence locations. Work is scheduled to be completed in December 2015. Acceptance is expected in March 2016.

### *Buena Vista Pumping Plant and Chrisman Pumping Plant*

Roofing repairs at Buena Vista and Chrisman pumping plants (South San Joaquin Division) and at Warne Powerplant (West Branch) (Specification No. 10-19) began in October 2010. Work was completed in 2011 and accepted in January 2013.

### *San Joaquin and Southern Field Divisions*

Construction to seal and pave roads within the San Joaquin and Southern field divisions (Specification No. 12-08) began in August 2012. Work is scheduled to be completed in December 2013. Acceptance is expected in February 2014.

### *Delta, San Luis, San Joaquin, and Southern Field Divisions*

Installation of copper communication cable (Specification No. 12-04) began in June 2012. Work is scheduled to be completed in January 2014. Acceptance is expected in March 2014.

### *Edmonston, Chrisman, Teerink, and Buena Vista Pumping Plants—Replace Annunciator Panels*

The work (Specification No. 13-09) that began in November 2013 consists of



replacing 57 annunciator panels and the associated hardware for the equipment. Work is scheduled to be completed in January 2015. Acceptance is expected in March 2015.

### ***Devil's Den, Bluestone, and Polonio Pass Pumping Plants—Cathodic Protection Rehabilitation***

Work began in September 2013 (Specification No. 13-13) to remove encasement at insulating coupling flanges and install new insulating sleeve couplings inside new cast-in-place vaults. Work is scheduled to be completed in January 2014. Acceptance is expected in March 2014.

### ***Badger Hill Pipeline—Repair***

Work began in November 2013 (Specification No. 13-14) to remove and replace the existing lining in manifolds and pipeline, construct a flow metering vault, remove and replace a joint at Check 66, and remove and reinstall pipe spool pieces. Work is scheduled to be completed in April 2014. Acceptance is expected in June 2014.

## **Miscellaneous Construction Activities**

The following non-SWP construction activities are categorized as miscellaneous.

### ***Erosion Repair and Bank Protection***

Work began in September 2011 (Specification No. 11-06) to repair erosion along the San Joaquin River (River Mile 71.5R). The work includes:

- fencing;
- protection of native trees;
- removal of trees, brush, and debris;
- earthwork;
- rock slope protection;
- installation of erosion control fabric;
- asphalt, concrete, and pavement repairs;

- planting, seeding, and irrigation;
- placement of in-stream woody materials; and
- plant establishment.

Work was completed in December 2013. Acceptance is expected in March 2014.

A minor contract to repair levee erosion along the Sacramento River at Miles 36.8L, 46.7L, and 56.6L (Specification No. 12-09) began in August 2012. Work was completed in November 2012 and accepted in February 2013.

### ***North Levee Setback***

Construction began in July 2013 (Specification No. 13-02) on Cache Creek at Miles 3.9 and 4.2 to remove trees and vegetation, demolish the existing patrol road, construct a new levee and ramp, realign and construct a new county road, and seed the area. Work was completed in August 2013. Acceptance is expected in May 2014.

### ***North Channel Crossing Replacement***

Work began on the San Joaquin River Parkway, Sycamore Island in July 2013 (Specification No. 13-08) to remove vegetation, rubbish, and existing corrugated metal pipe culvert; replace the multiplate culvert with concrete footings; and complete earthwork on the existing embankment, new guard railing, and erosion protection. Work was completed in November 2013. Acceptance is expected in March 2014.

### ***Habitat Restoration***

In October 2010, work began on a contract (Specification No. 10-14) to restore the Sycamore Creek habitat as a condition of the U.S. Army Corps of Engineers nationwide permit for the Sycamore Creek sediment removal project (Specification No. 10-13). Work is scheduled to be completed and accepted in July 2014. The work includes seeding, plantings, an irrigation system,



signage, and monitoring of vegetation until the plants are established.

### ***Pumping Plant Control System Rehabilitation***

Replacement of the motor control centers and the control systems at Sutter Bypass Pumping Plants Nos. 1 through 3 will be performed under a contract that began in December 2010 (Specification No. 10-09). The contractor will remove and dispose of the existing control structures and will furnish and install new control structures, switchgear, nonsegregated busses, relays, supervisory control and data acquisition systems, ground grids, and generators. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.

### ***Replacements***

A contract (Specification No. 10-05) to replace the existing fish ladder structure and flow-control structures at Willow Slough in the Sutter Bypass began in June 2010. Work was completed in October 2013 and accepted in December 2013.

A project to replace Weir No. 2 in the East Borrow Canal in the Sutter Bypass began in April 2011 (Specification No. 10-08). The work includes a new weir structure and fish ladder approximately 100 feet downstream from the existing weir and a control building on the levee. Work is scheduled to be completed in 2014. Acceptance is expected in June 2014.

### ***Knights Landing Outfall Gates***

A project to rehabilitate the structure and update the communications system for the operation of the Knights Landing Outfall gates began in January 2012 (Specification No. 11-13). The structure provides controlled drainage of flood and irrigation waters into the Sacramento River, controls irrigation levels within Colusa Drain and Knights Landing Ridge Cut, and acts as a barrier to

keep flood waters in the Sacramento River from entering the Colusa Drain and Ridge Cut. The structure's gate system required extensive maintenance. Consistent damage to the telephone line compromised control system reliability, and frequent malfunction of the debris boom damaged the boom's structure, causing debris to clog the gates or prevent gate closure. Work was completed in April 2013 and accepted in July 2013.

## **Real Estate Activities**

DWR processed a net total of \$2.76 million in payments in 2013 in support of right-of-way activities required for the construction, operation, and maintenance of the SWP. This amount represents direct payments made for the cost of real property rights, damages, temporary entry permits, licenses, leases, and relocation expenses.

DWR conducted the following real estate activities from January 1 through December 31, 2013.

### **SWP Acquisitions**

Activities related to acquisitions were as follows:

- executed seven agreements for the California Irrigation Management Information System program;
- issued 23 notices to property owners regarding planned activities to conduct global positioning system surveys and place and locate aerial targets used for mapping;
- negotiated the settlement agreement for the condemnation suit against Mentone Citrus for the acquisition of the Citrus Reservoir project site as part of the East Branch Extension Phase II project;
- coordinated the relocation of five Southern California Edison facilities in conflict with the East Branch Extension Phase II project and processed associated reimbursement payments;

- secured an encroachment permit extension from the California Department of Transportation to accommodate DWR's construction schedule for the San Joaquin Field Division Facility Modifications Project—Devil's Den Turnout Access Vault Project;
- executed a permanent nonexclusive access easement deed and a quitclaim deed with Wentz Bros. for DWR Parcel No. DLV-121 to relinquish old access rights and establish new access rights on the access road constructed during the South Bay Aqueduct Improvement and Enlargement Project in Alameda County;
- acquired a permit from the San Francisco Public Utilities Commission allowing DWR to store sections of 84-inch pipe near Sunol in Alameda County for emergency purposes in case of a South Bay Aqueduct pipeline break;
- executed a license from property owner, Discovery Bay Yacht Harbor, LLC, allowing for the continued operation and maintenance of existing DWR monitoring station S21;
- secured an extension for an encroachment permit number from the City of Lathrop for water quality monitoring station S50 on the east piling of the Mossdale Bridge;
- received the title of policy insurance confirming DWR fee title for DWR Parcel No. D-SL-6 closing an existing gap in SWP operating right-of-way as part of the Byron Road Bridge Relocation Project;
- closed escrow on 64.24 acres of mitigation property in Riverside County known as DWR Parcel Number 3-6003 for the Lake Perris Dam Remediation Project mitigation;
- closed escrow to record an easement deed and quitclaim deed as part of the Agreement for the Exchange of State Right of Way and Replacement of Roads—Amendment No. 1 with Tejon Ranch for the Tejon Ranch Commerce Center Project;
- closed escrow on 243 acres of land in the Suisun Marsh (Parcel No. SML-144) for habitat restoration as part of the Fish Restoration Program;
- executed a license agreement with San Joaquin County for continued access, use, and maintenance of DWR monitoring station S31;
- executed a Reclamation license agreement to release fish at the fish release site known as "Emmaton Site" on Sherman Island Road in Sacramento County;
- processed one claim for damages to property and reimbursement of expenses and the submittals for payment;
- secured approval from Reclamation to perform environmental studies on property known as the Parkhurst Triangle as part of the Cantua Creek Stream Group Improvements Project;
- acquired a permanent pipeline easement for DWR Parcel No. D-SL-275 required for the Milepost 62 Pipeline Relocation Project in Merced County;
- executed a right-of-way contract for the temporary construction area for property known as DWR Parcel No. D-SL-276 for temporary ingress, egress, and storage of equipment required for the Milepost 62 Pipeline Relocation Project in Merced County;
- sent the required notice letters to the California Department of Conservation and Merced County Board of Supervisors informing them of DWR's acquisition of agricultural preserve land under the protection of the Williamson Act for the Milepost 62 Pipeline Relocation Project;
- processed the initial warrant request to pay an invoice received from Phillips 66 for work completed as part of the Milepost 62 Pipeline Relocation Project;
- secured an easement deed, right-of-way contract, and agreement for damages necessary to certify construction of planned improvements to the Curtis Landing fish release site, DWR Parcel

Number WDWM-43, in Sacramento County;

- secured an encroachment permit from Reclamation District 341 to construct planned improvements to the Curtis Landing fish release site;
- processed an invoice from Sacramento County to pay for inspection fees associated with an encroachment permit allowing DWR to construct a gate and pull box for electrical conduit in county right-of-way as part of the Curtis Landing fish release site;
- executed an agreement for exchange of easements with Tejon Mountain Village, LLC describing the terms and conditions to quitclaim DWR Parcel No. TEH-1-C in exchange for a new nonexclusive access road easement known as DWR Parcel No. TEH-18 in Kern County;
- executed an agreement allowing Contra Costa Water District to discharge water on portions of DWR property, known as DWR Parcel Nos. CF-07-03 and CF-07-02, in Contra Costa County as part of the Dutch Slough Tidal Marsh Restoration Project;
- executed Lease Agreement No. 2 with Morrow Island Land Company for continued access, use, and maintenance of DWR monitoring stations SM-35 and SM-37 in Solano County;
- processed an invoice to pay for continued access and maintenance of water quality monitoring station SM-49 in Solano County; and
- secured a permit from the Sacramento-Yolo Port District to access the property on Prospect Island to install temporary hydrophone monitoring equipment in order to conduct biological surveys and fish monitoring activities in support of the Bay-Delta Office's 2014 Georgiana Slough Fish Barrier Project.

## Temporary Entry Permits

DWR obtained 101 temporary entry permits including:

- Arroyo Pasajero Phase II Project, 4;
- Doughty Cut Flow Monitoring Project, 7;
- East Branch Extension Phase II project, 1;
- Georgiana Slough nonphysical fish barrier, 7;
- North Bay Aqueduct Alternate Intake Project, 54;
- North Central Region Office—South Delta monitoring stations, 1;
- North Central Region Office—coordinated temporary entry permits, 5;
- Sacramento River channel improvements, 2;
- San Joaquin River Restoration Project, 11;
- South Delta Improvements Program—Temporary Barriers Project, 3;
- South Delta Improvements Program—water seepage monitoring stations, 3;
- South Delta ecosystem enhancement, 1;
- South Bay Aqueduct, Milepost 39 repairs, 1; and
- Walnut Grove water quality station, 1.

## SWP Property Management

Property management activities during 2013 were as follows:

- managed leasing activities of SWP nonoperating properties, which produced \$845,276;
- processed 17 encroachment permit applications and executed 19;
- collected fees of \$192,331 for review and inspection costs related to encroachment permit applications; and
- coordinated review of 16 tentative tract map developments within 1 mile of the California Aqueduct.

## SWP Appraisals

In calendar year 2013, 51 percent of total appraisal assignments (21 of 41) completed by DWR were exclusively for the SWP. These assignments included the following:

- Division of Flood Management, Winter Island Acquisition Feasibility Project—completed 4 appraisals;
- Division of Flood Management, Sacramento Bank Protection Project Cache Creek Levee Mile 3.4L—completed 2 supplemental memos;
- Bay Delta Office, the Curtis Landing fish release site acquisition project—completed 1 appraisal;
- Delta Habitat Conservation and Conveyance Program—completed 9 appraisals;
- SWP Property Management—completed 2 lease appraisals;
- Fish Restoration Program—completed 1 appraisal;
- Lake Perris Remediation Project—completed 1 appraisal; and
- Division of Flood Management, Sutter Maintenance Yard Acquisition Project—completed 1 appraisal.

**Table 12-1 Design Activities, January 1, 2013, through December 31, 2013, by Division**

<b>Division and Facility</b>	<b>Design Activity</b>	<b>Date Design Began</b>	<b>Design Actual/ Estimated Completion Date</b>
<b>Oroville Division</b>			
Oroville and Thermalito dams	Radial gate structural re-evaluation	July 2011	October 2014
<b>Delta Facilities</b>			
Fish screens at Sherman and Twitchell islands	New fish screens at existing siphons—10 sites	September 2007	June 2014
<b>North Bay Aqueduct</b>			
North Bay Aqueduct	Alternate intake study	October 2008	June 2014
<b>North San Joaquin Division</b>			
Clifton Court Forebay	Radial gate repair	July 2013	July 2014
<b>San Luis Division</b>			
Sisk Dam	Seismic re-evaluation study	July 2007	March 2013
Los Banos Creek	Detention dam—recoat outlet works piping	November 2011	April 2013
<b>South San Joaquin Division</b>			
Edmonston, Chrisman, Teerink, and Buena Vista pumping plants	Replace septic tanks	June 2012	On hold
	Furnish and install annunciator panels	February 2012	March 2013
San Joaquin Field Division	Emergency generator replacement	October 2012	February 2014
	Cathodic protection—insulated coupling vaults	January 2012	June 2013
<b>East Branch Enlargement</b>			
East Branch Enlargement Phase II	Preliminary design and environmental documents	March 2007	2014
<b>Mojave Division</b>			
San Joaquin Field Division	Badger Hill pipeline repair	March 2012	July 2013
<b>Santa Ana Division</b>			
East Branch Extension Phase II	Furnish 5 kV switchgear	July 2008	October 2013
Perris Dam	Embankment remediation	January 2007	March 2013
	Emergency release extension	October 2006	September 2015
Gorman Creek Improvement Channel	Pipeline installation and channel repairs	May 2011	June 2013
Antelope Valley-East Kern Water Agency Turnout	Replacement design	January 2010	April 2013
<b>West Branch</b>			
Pyramid Dam	Radial gate structural re-evaluation	July 2011	October 2014
<b>Miscellaneous</b>			
Delta and San Luis field divisions	Seal and pave roads and parking areas	October 2012	March 2013
State Water Project	Copper communication cable and voice and data equipment monitoring, testing, and repair	January 2013	November 2013
Los Robles Bridge (not part of seismic program)	Seismic analysis	August 2005	February 2014



**Table 12-2 Construction Activities, January 1, 2013, through December 31, 2013, by Division** Sheet 1 of 4

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (Notice to Begin Work)	Acceptance Date (expected or actual)	Contract Costs (in thousands of dollars)
<b>State Water Project—General</b>				
State Water Project Supervisory Control and Data Acquisition System	Replace remote terminal units (08-12)	May 2009	May 2015	12,112
<b>Oroville Division</b>				
Brad B. Freeman Bike Trail	Realignment in the Lake Oroville State Recreation Area (13-03)	May 2013	March 2014	473
Robie Thermalito Pumping-Generating Plant	Cleanup and restoration Phase1—clean and repair fire-impacted equipment (13-16)	October 2013	January 2015	1,218
Oroville Operations and Maintenance Center	Build new garage shop and perform site work (11-03)	August 2011	March 2014	1,427
<b>South Bay Aqueduct</b>				
South Bay Aqueduct Enlargement and Improvement				
Dyer Canal, Livermore Canal, Alameda Canal, and Del Valle Pipeline	Perform canal modifications (09-16)	October 2010	June 2014	26,302
Siphon and Check Structure Modifications	Furnish check structure equipment (08-21)	January 2009	April 2014	3,387
Transmission Line and Modifications to Banks Switchyard	Construct 69 kV transmission line and modify Banks Switchyard (09-06)	October 2009	April 2014	8,143
South Bay Pumping Plant	Furnish 45 cfs pump and motor units and one spare pump and motor (04-05)	November 2004	June 2014	7,370
	Furnish valves, actuators, and hydraulic power unit (04-20)	May 2005	June 2014	2,258
	Furnish switchyard equipment (05-10)	September 2005	February 2014	1,303
	Furnish 5 kV switchgear (05-05)	October 2005	June 2014	3,608
	Construct pumping plant enlargement—initial facilities (06-04)	August 2006	June 2014	16,704
	Furnish power transformers (07-02)	April 2007	January 2013	4,647
	Complete pumping plant enlargement (07-18)	December 2007	June 2014	22,401
Surge Tanks	Seismically retrofit Surge Tank Nos. 1 and 2 (11-11)	October 2011	February 2013	4,503
Del Valle Dam	Bulkhead installation and removal (12-14)	October 2012	January 2014	76,658
<b>North San Joaquin Division</b>				
Skinner Fish Science Building	Delta Fish Survival Improvements Program (12-15)	December 2012	May 2014	5,498
Skinner Fish Facility	Emergency radial gate repairs—remove, clean, and repair 3 stoplogs (13-15)	July 2013	March 2014	827

**Table 12-2 Construction Activities, January 1, 2013, through December 31, 2013, by Division** Sheet 2 of 4

<b>Construction Division and Facility</b>	<b>Construction Contract (Specification Number)</b>	<b>Starting Date (Notice to Begin Work)</b>	<b>Acceptance Date (expected or actual)</b>	<b>Contract Costs (in thousands of dollars)</b>
<b>San Luis Division</b>				
Dos Amigos Pumping Plant	Replace trash rake system and trash racks (08-06)	January 2009	February 2013	3,396
Gianelli Pumping-Generating Plant	Replace heating, ventilation, and air-conditioning system (10-22)	April 2011	March 2013	574
Chowchilla Canal Bypass Structure	Radial gate modifications (12-17)	September 2012	February 2013	213
Los Banos Creek Detention Dam Outlet Works Piping	Recoat 525 feet of discharge pipe (13-04)	July 2013	October 2014	889
Delta and San Luis field divisions	Seal and pave roads and parking areas (13-06)	July 2013	June 2014	7,732
<b>Tehachapi Division</b>				
Edmonston Pumping Plant	Replace pumps, Units W2, W4, W6, and W8 (02-10)	June 2003	November 2015	35,000
	Furnish and deliver spare parts (11-02)	June 2011	June 2013	5,431
Edmonston Pumping Plant, Teerink Pumping Plant, and control buildings, various sites	Roofing replacement (12-06)	October 2012	July 2014	1,979
Chrisman Pumping Plant and Devil's Den Pumping Plant	Site improvements (12-12)	December 2012	July 2014	4,359
Gorman Creek Improvement Channel, south of Orin Way	Pipeline installation and channel repairs (13-05)	June 2013	April 2014	2,554
East Branch, Milepost 342.65	Repair canal lining (13-10)	July 2013	May 2014	1,071
Antelope Valley-East Kern Water Agency Turnout	Construct turnout (13-11)	August 2013	December 2014	911
<b>Mojave Division</b>				
California Aqueduct Reaches 18A and 22B	Seal and pave roads and parking areas (10-03)	July 2010	January 2013	3,149
Cedar Springs Dam	Replace conduits and perform miscellaneous work (10-06)	March 2011	January 2014	929
Pearblossom Pumping Plant	Construct 20,000 square-foot Leadership in Energy and Environmental Design gold-rated administration building (10-23)	February 2011	June 2014	13,586
<b>Santa Ana Division</b>				
East Branch Extension Phase I Improvements				
Crafton Hills Reservoir Enlargement	Increase operating storage of the reservoir (11-12)	December 2011	December 2014	8,377
East Branch Extension Phase II				
Citrus Reservoir	Construct new reservoir (12-02)	June 2012	October 2014	19,654
Mentone Pipeline	Construct pipeline from Foothill Pump Station to Citrus Reservoir and from Citrus Pump Station to Crafton Hills Pump Station (12-03)	July 2012	December 2014	42,729

**Table 12-2 Construction Activities, January 1, 2013, through December 31, 2013, by Division** Sheet 3 of 4

Construction Division and Facility	Construction Contract (Specification Number)	Starting Date (Notice to Begin Work)	Acceptance Date (expected or actual)	Contract Costs (in thousands of dollars)
Valves	Manufacture, test, and deliver 3 energy dissipating valves for Citrus Reservoir (10-10)	September 2010	June 2014	700
	Manufacture, test, and deliver 14 ANSI butterfly valves for Citrus, Crafton Hills, and Cherry Valley pump stations (10-16)	January 2011	June 2014	1,320
	Manufacture, test, and deliver 12 AWWA butterfly valves for Crafton Hills and Cherry Valley pump stations and Mentone Pipeline (10-17)	February 2011	June 2014	550
	Manufacture, test, and deliver 12 ANSI ball valves for Citrus, Crafton Hills, and Cherry Valley pump stations (10-18)	January 2011	June 2014	3,300
Transformers	Manufacture, test, and deliver transformers and accessories for Citrus Pump Station (10-20)	March 2011	August 2015	793
Santa Ana Pipeline	Repair pipeline, Mileposts 422.5 and 425.3, under Warm Creek (12-11)	September 2012	October 2013	2,955
Crafton Hills Pump Station and Citrus Pump Station	Pump station expansion and initial construction (12-10)	October 2012	August 2014	25,566
Citrus, Crafton Hills, and Cherry Valley pump stations	Furnish equipment and hardware—pumps, motors, variable frequency drives, excitation systems (13-01)	June 2013	December 2015	2,144
<b>West Branch</b>				
West Branch (Reach 29G) General	Construct road and embankment improvements (10-03 change order)	July 2011	February 2013	3,149
Oso Pumping Plant	Construct civil maintenance and mobile equipment building (07-22)	December 2007	June 2014	4,048
<b>Multiple Divisions</b>				
Delta Facilities, Suisun Marsh Facilities, and California Aqueduct	Install and remove temporary rock barriers—2010 to 2012 (09-21)	March 2010	October 2013	19,530
Temporary rock barriers, 2013, 2014, and 2015	Installation and removal at various Delta locations (12-18)	January 2013	March 2016	11,834
Buena Vista Pumping Plant and Chrisman Pumping Plant	Roofing repairs (10-19)	October 2010	January 2013	1,041
San Joaquin and Southern field divisions	Seal and pave roads (12-08)	August 2012	February 2014	4,918
Delta, San Luis, San Joaquin, and Southern field divisions	Copper communications cable—voice and data equipment—monitoring, testing, and repair—California Aqueduct (12-04)	June 2012	March 2014	953
Edmonston, Chrisman, Teerink, and Buena Vista pumping plants	Annunciator panels—replace panels and hardware (13-09)	November 2013	March 2015	815
Devil's Den, Bluestone, and Polonio Pass pumping plants	Cathodic protection rehabilitation—remove encasement at insulating coupling flanges/ install new insulating sleeve couplings (13-13)	September 2013	March 2014	743
Badger Hill Pipeline	Repair pipeline (13-14)	November 2013	June 2014	3,325

**Table 12-2 Construction Activities, January 1, 2013, through December 31, 2013, by Division** Sheet 4 of 4

<b>Construction Division and Facility</b>	<b>Construction Contract (Specification Number)</b>	<b>Starting Date (Notice to Begin Work)</b>	<b>Acceptance Date (expected or actual)</b>	<b>Contract Costs (in thousands of dollars)</b>
<b>Miscellaneous Activities (Non-SWP)</b>				
San Joaquin River Mile 71.5R	Repair levee erosion and protect banks (11-06)	September 2011	March 2014	3,571
Sacramento River Miles 36.8L, 46.7L, and 56.6L	Levee erosion repair (12-09)	August 2012	February 2013	311
North Levee Setback—Cache Creek Levee Miles 3.9 and 4.2	Setback levee construction (13-02)	July 2013	May 2014	676
North Channel Crossing—San Joaquin River Parkway, Sycamore Island	Crossing replacement (13-08)	July 2013	March 2014	170
Sycamore Creek	Restore habitat as a condition of permit for sediment removal project (10-14)	October 2010	July 2014	428
Sycamore Creek	Sediment removal project (10-13)	October 2010	July 2014	428
Sutter Bypass	Replace motor control centers and control system at Pumping Plant No. 1, Pumping Plant No. 2, and Pumping Plant No. 3 (10-09)	December 2010	June 2014	6,830
Sutter Bypass, Willow Slough	Replace existing fish ladder (10-05)	June 2010	December 2013	3,340
Sutter Bypass, East Borrow Canal	Replace Weir No. 2 (10-08)	April 2011	June 2014	6,570
Knights Landing Outfall Gates	Replace gates, valves, seals, motor controls, and related apparatus (11-13)	January 2012	July 2013	2,066







## Chapter 13 Recreation

*Kiteboarding at Sherman Island.*



## Significant Events in 2013

In June 2013, the Department of Water Resources (DWR), along with the California Department of Parks and Recreation (California State Parks), the California Department of Forestry and Fire Protection (CAL FIRE), and the Department of Fish and Wildlife (DFW), hosted its first Catch A Special Thrill (C.A.S.T.) for Kids event in the Sacramento-San Joaquin Delta at Brannan Island State Recreation Area. Thirty-three children with special needs were treated to a day of fishing with tournament fishermen from around the area. This was DWR's first C.A.S.T. event that was not held at an SWP reservoir.

Relatively low water at Lake Oroville throughout 2013 impacted recreation attendance at several major reservoir-based facilities. Conversely, increases in attendance were measured by DWR's traffic counter network at sites not suffering diminished water levels (such as Thermalito Forebay and Afterbay and Oroville Wildlife Area).

DFW changed the black bass slot limit in the general State freshwater sport fishing regulations for Lake Oroville to 12 inches or longer. The change includes all black bass genera found at Lake Oroville, such as Alabama Spotted Bass, Redeye Bass, Largemouth Bass, and Smallmouth Bass.

*Information for this chapter was provided by the Division of Integrated Regional Water Management, Public Affairs Office, Division of Environmental Services, Oroville Field Division, and the State Water Project Analysis Office.*

The State Water Project (SWP) is a multipurpose project that provides recreational benefits to millions of Californians. In addition to providing water supply, flood control, and habitat for fish and wildlife, the SWP offers extensive and varied recreational opportunities—tours, sightseeing, fishing, hunting, picnicking, camping, boating, water skiing, bicycling, hiking, and swimming. Under the Davis-Dolwig Act (DDA), these recreational opportunities, as well as fish and wildlife enhancements, are not allocable as water and power costs to the SWP water contractors. They are financed by Department of Water Resources' (DWR) existing authorities under the Burns-Porter Act and appropriations from the Legislature specifically for these purposes.

## Recreation Areas

The SWP has 37 developed recreation areas, or sites, throughout California, including 18 developed fishing access sites. Figure 13-1 shows the name and location of each area.

## Recreation Use

Since the SWP began delivering water in 1962, nearly 235 million recreation days have been recorded at SWP recreation facilities. A recreation day is defined as one individual user visiting a recreation site along the SWP within all or part of a one-day period.

In 2013, most SWP recreation use was concentrated at the lakes and major reservoirs, with 37 percent occurring in the Oroville Field Division and 45 percent occurring in the Southern Field Division.

Two of the three visitors centers experienced an increase in visitation in 2013. Romero Overlook Visitors Center and Lake Oroville Visitors Center saw an increase in visitation, 5.6 percent and 17.6 percent respectively, while Vista del Lago Visitors Center saw a decrease of 37.2 percent. Vista del Lago may have experienced the significant drop in visitation due to a large highway construction project that changed the off-ramp configuration to the visitors center for several months in 2013.

Visitation at DWR's three SWP educational visitors centers totaled:

- 87,000 recreation days at Lake Oroville Visitors Center;
- 168,300 recreation days at Romero Overlook Visitors Center, San Luis Reservoir; and
- 104,900 recreation days at Vista del Lago Visitors Center, Pyramid Lake.

Overall, recreation usage of approximately 4.0 million recreation days at the SWP reservoirs listed in Table 13-1 contributed significantly to the total number of day-use visitors reported at the 280 units of the California State Park System.

## Facilities

### Planning

#### *Lake Oroville State Recreation Area*

In 2013, DWR and the California Department of Parks and Recreation (California State Parks) planned a number of future improvements to the facilities at Lake Oroville State Recreation Area.

Lake Oroville Marina and Bidwell Canyon Marina have continued to work with DWR and California State Parks on the Exposed Polystyrene Inspection and Replacement Program. Progress was made in the second year of the program, and it will be continued.



Figure 13-1 Names and Locations of SWP Recreation Areas



**Table 13-1 Estimated Recreation Days in 2013, by Field Division and Facility**

Field Division and Facility	Recreation Days (rounded)	
<b>Oroville Field Division</b>		
Frenchman Lake	38,100	e
Antelope Lake	24,100	e
Lake Davis	25,900	e
Lake Oroville and Thermalito Forebay	772,700	
Thermalito Afterbay and Oroville Wildlife Area	295,700	
Feather River Fish Hatchery	209,800	
Lake Oroville Visitors Center	87,000	
<b>Subtotal</b>	<b>1,453,300</b>	
<b>Delta Field Division</b>		
Lake del Valle	411,500	
Bethany Reservoir	4,400	e(1)
Fishing Access Site:		
Niels Hansen	100	e(1)
California Aqueduct:		
Walk-in Fishing	100	e(1)
Bikeway	100	e(1)
White Slough Wildlife Area	12,500	e(1)
<b>Subtotal</b>	<b>428,700</b>	
<b>San Luis Field Division</b>		
San Luis Reservoir SRA: San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	147,100	
Romero Overlook Visitors Center	168,300	
California Aqueduct:		
Walk-in Fishing	2,300	e(2)
Wildlife Areas	1,500	e(2)
<b>Subtotal</b>	<b>319,200</b>	
<b>San Joaquin Field Division</b>		
Fishing Access Sites: Kettleman City, Lost Hills, Buttonwillow, and California Aqueduct Walk-in Fishing	20,900	e(1)
<b>Subtotal</b>	<b>20,900</b>	
<b>Southern Field Division</b>		
Silverwood Lake	343,500	
Lake Perris	668,700	
Vista del Lago Visitors Center	104,900	
Pyramid Lake	117,000	
Castaic Lake and Castaic Lagoon	535,700	
Fishing Access Sites:		
Quail Lake	1,700	e(1)
77th Street East	10	e(1)
Longview Road	200	e(1)
California Aqueduct:		
Walk-in Fishing	2,400	e(1)
Bikeway	6,200	e(1)
<b>Subtotal</b>	<b>1,780,310</b>	
<b>Total for Recreational Sites</b>	<b>3,642,210</b>	
<b>Total for Visitors Centers</b>	<b>360,200</b>	
<b>Grand Total</b>	<b>4,002,410</b>	

Note: These values are provided by facility operators, and numerous other sources, and vary in their degree of accuracy. Recreation days are based on counts except where marked "e," which are based on partial data: e(1) these locations are not regularly monitored and are visually monitored only. It is likely that these areas are used significantly more than what is represented here, but it is difficult to ascertain a realistic annual use; e(2) fishing access on or adjacent to the dams has been eliminated due to security concerns, resulting in a significant decrease in attendance in the general areas. Beginning in 2011, all locations within the Southern Field Division are being reported on a calendar-year basis.

California State Parks continues to work on a Kelly Ridge Fuel Break. The purpose of the project is to maintain the shaded fuel break on the wildland-urban interface of Kelly Ridge homeowners and Lake Oroville State Recreation Area. California State Parks based this project on the general guidelines for creating defensible space developed by the State Board of Forestry and Fire Protection. It is designed to reduce the chance that wildland fires on State land could spread to residential structures on adjacent private land. The work involves the removal and thinning of trees, shrubs, and grasses. Debris is cut up and piled for burning within cleared areas in the fuel break, or chipped and scattered as mulch. California State Parks will continue to maintain an approximately 100-foot-wide by 13,750-foot-long fuel break annually.

### **Lake del Valle State Recreation Area**

East Bay Regional Park District is preparing to replace a campground restroom with a new restroom building, funded partially by park entrance fees.

### **Silverwood Lake State Recreation Area**

California State Parks has three projects planned to improve accessibility for users with limited mobility. These plans concentrate on renovating the restrooms and facilities at Cleghorn, the marina, and Mesa Campground. There is also a limited mobility trail project in Cleghorn and plans to make improvements to Lot 3.

There are also plans to reopen the Miller Canyon Group camp.

## **New Facilities**

### **Lake Oroville State Recreation Area**

California State Parks and DWR purchased a new sewage pump boat for lake operations.

Additionally, a trail access spur was constructed near the Thermalito Diversion



Pool to connect the newly relocated Brad B. Freeman Trail to the Dan Beebe Trail.

Completion of the extension of the North Fork Trail enabled the July opening of three new campsites for equestrian use in the Bloomer Area. These campsites are about 9.6 miles from the spillway parking lot and share a restroom with the Bloomer Group boat-in campsite. Each site consists of a corral with a feeder, a picnic table, a fire ring with a removable grate, and a 10-foot-square tent pad located higher than the corral.

A day-use area with ramadas was also upgraded at Lime Saddle Marina.

### ***Castaic Lake State Recreation Area***

The County of Los Angeles Department of Parks and Recreation completed a Lower Lagoon launch ramp extension project at Castaic Lake State Recreation Area. This project included adding a walkway from the parking lot to the restrooms and parking lot improvements. The walkway and parking lot improvements were designed and built for users with limited mobility, as were the previously built restrooms along the walkway.

## **Improvements to Facilities**

### ***Antelope Lake***

The California State Parks Division of Boating and Waterways, with the U.S. Forest Service, completed an upgrade to the Lost Creek Cove Boat Ramp. This included striping the parking lot and creating a picnic area for users with limited mobility.

### ***Frenchman Lake***

The California State Parks Division of Boating and Waterways, with the U.S. Forest Service, completed work on an existing boat ramp, which included construction of a trail near the dam designed for users with limited mobility. The construction also included

striping and modifying the boat ramp and its parking area.

### ***Lake Davis***

The California State Parks Division of Boating and Waterways, with the U.S. Forest Service, continued work on the Honker Cove Boat Ramp. This included new pavement, extending the ramp, and placement of woody habitat into the lake for aquatic species.

The U.S. Forest Service also hired a private contractor to improve the bike/walking trail around Lake Davis.

### ***Lake Oroville State Recreation Area***

The 41-mile-long Brad B. Freeman Bike Trail below Lake Oroville is safer because of a trail realignment project completed by California State Parks trail crews and a DWR contractor. A 3,300-foot-long trail segment that previously crossed Union Pacific Railroad tracks near the Thermalito Diversion Dam was rerouted closer to the Diversion Pool (away from Union Pacific Railroad property) and now crosses under the railroad bridge that spans the Diversion Pool. The project was conceived in 2004; however, final designs by DWR engineers required years of negotiations with Union Pacific Railroad. To enhance trail-user safety, the trail has fencing and overhead protection at the train trestle undercrossing. This project was completed in 2013.

DWR employees completed improvements to the Oroville Dam Upper Overlook, a project that began in 2012. The site was a popular “vista point” during construction of Oroville Dam and still provides a dramatic view of the dam, Lake Oroville, and the surrounding countryside. Upgrades to the overlook, located 50 feet above the dam at Canyon Drive and Royal Oaks Drive, include a new ramada, an old 165,000-pound impeller from the Hyatt Powerplant beneath Oroville Dam, interpretive signs, picnic tables, and landscaping. The project was partially

funded by a Land and Water Conservation Fund grant.

A stairway construction project was completed at Monument Hill. The new stairway connects the lower boat ramp parking lot to the upper parking lot and restroom facilities.

Prescribed burns were performed by the California Department of Forestry and Fire Protection (CAL FIRE) in the Loafer Creek Recreation Area as part of the Fuel Load Management Plan. Approximately 50 acres were treated.

California State Parks is replacing 22 failing light fixtures with energy efficient light fixtures at the Lime Saddle Marina parking lot. The previous fixtures used 480 watts; the upgrades are bi-level and will use between 70 and 130 watts. The 2-year project will be completed in 2014. Additionally, three shade ramadas at the Lime Saddle Day Use Area and Boat Launch have been replaced on the point overlooking the marina.

Concrete tables have been installed at the Bloomer Group boat-in campsite.

### ***Lake del Valle State Recreation Area***

Lake del Valle staff replaced partition walls in several restrooms throughout the campgrounds.

### ***San Luis Reservoir State Recreation Area***

Romero Overlook Visitors Center had some remodeling done in 2013; the bathrooms were completely remodeled, the outside walls were reinsulated, and some interior walls were moved to improve the interior space.

### ***Castaic Lake State Recreation Area***

Three picnic shade structures were replaced at Castaic Lake State Recreation Area.

### ***Lake Perris State Recreation Area***

In 2013, California State Parks performed the following improvements at Lake Perris State Recreation Area:

- three parking lots and several roads received slurry seals;
- a water intake pump, used for park irrigation, was overhauled; and
- three potable water tanks were repainted and recoated to bring them up to Cal/OSHA standards.

## **Recreation Activities**

The SWP, with its many reservoirs and hundreds of miles of aqueducts, offers Californians many recreational opportunities. From Antelope Lake in Northern California to Lake Perris in Southern California, the SWP includes facilities for anglers, boaters, campers, hikers, cyclists, and many others. While DWR manages the routing of water through the aqueducts and reservoirs, the recreational facilities are operated variously by federal, State, and local agencies and, in many cases, their private concessionaires. Visitors to these facilities can swim, water ski, picnic, and enjoy many other activities. See Figure 13-2 for the various types of recreation available along the SWP.

In June, DWR, along with California State Parks, CAL FIRE, and the Department of Fish and Wildlife (DFW) hosted its first Catch A Special Thrill (C.A.S.T.) for Kids event in the Sacramento-San Joaquin Delta at Brannan Island State Recreation Area. Thirty-three children with special needs were treated to a day of fishing with tournament fishermen from around the area. This was DWR's first C.A.S.T. event that was not held at an SWP reservoir.

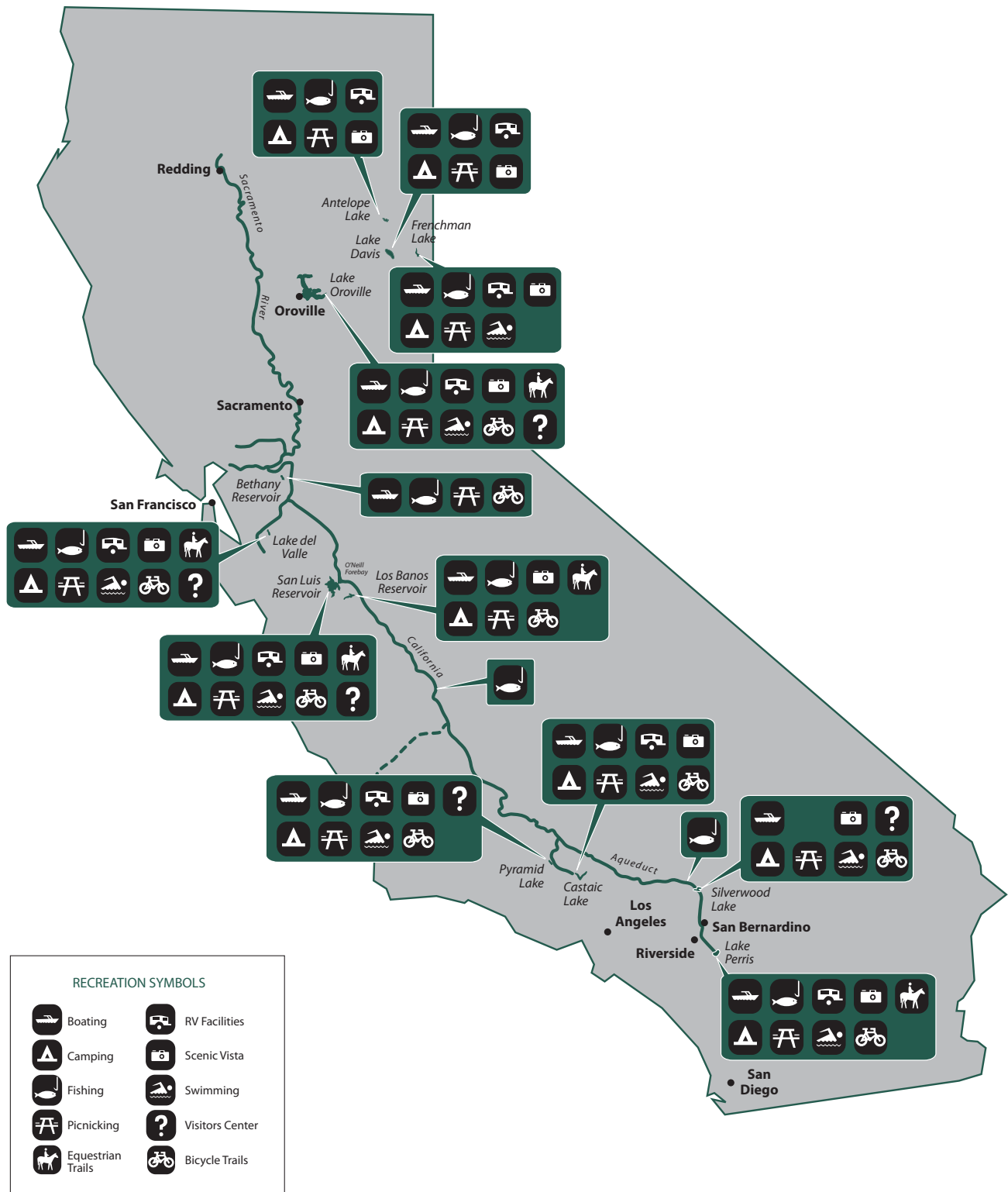


Figure 13-2 Types of Recreation along the SWP

## Lake Oroville State Recreation Area

DWR, California State Parks, and other agencies sponsored a number of activities at Lake Oroville State Recreation Area in 2013.

DWR co-hosted a Jack Splash Fit-N-Fun Day with the Oroville YMCA and the Feather River Rowing Club at the North Forebay Aquatic Center. Two-hundred-fifty children came to learn the value of exercise and healthy eating habits through various activities with staff.

DWR and California State Parks helped support, through a contract with the Oroville Chamber of Commerce, the annual Oroville Salmon Festival. This 1-day fall event was held at the Feather River Fish Hatchery, downtown Oroville, and the Feather River Nature Center, and was attended by an estimated 18,000 participants. About 600 visitors toured the Feather River Fish Hatchery during the event.

DWR co-hosted a 2-week Aquatic Adventure Camp program, with the Feather River Recreation and Parks District and the Chico Area Recreation District, for 36 local children. The children were educated in sailing, canoeing, sailboarding, proper use of safety equipment, water safety, and rescue techniques by North Forebay Aquatic Center staff.

Kiwanis hosted a “Hooked on Fishing, Not on Drugs” free kids’ fishing day at Bedrock Park in the spring with support from DWR staff. More than 1,000 people attended the half-day event.

A Native Ways Celebration, attended by 500 visitors, was held by California State Parks at the Lake Oroville Visitors Center.

California State Parks hosted Bidwell Bar Days at Bidwell Canyon Day Use Area’s historic Toll House. The event treats park visitors to a day in the life of the old west.

DWR staffed a booth to support Feather Fiesta Days. An estimated 12,000 visitors attended.

Mooretown Rancheria Cultural Camp was held at the North Forebay Recreation Area.

The annual 24 Hours of Gold Bicycle Race was held on the Lake Oroville Trail system and was based out of the Loafer Creek Campground.

California State Parks hosted Frontier Christmas at the Lake Oroville Visitors Center. Visitors learned how to make pioneer crafts and pan for gold.

DWR, California State Parks, and CAL FIRE hosted a C.A.S.T. for Kids fishing event for 34 children with special needs. The children were paired with experienced fishermen for a day of fishing on the lake. In addition, 185 volunteers helped make the event a success.

## Lake del Valle State Recreation Area

East Bay Regional Park District sponsored or co-sponsored the following activities in 2013:

- Coastal Cleanup 2013, where 28 volunteers cleaned up the lake shoreline contributing more than 84 hours and removing 402 pounds of trash and 28 pounds of recyclable materials;
- a Community Overnight Camping Program, which served 128 campers;
- a “Park’n It” Summer Day Camp Program, which served 175 children;
- with DWR and the Richmond Police Athletic League, an Aquatic Adventure Camp that served 30 children;
- two fishing programs, which served 20 participants;
- 24 campfire programs, which served a total of 3,507 attendees;



- 47 school programs, for 1,591 children; and
- 68 Regional in Nature (RIN) programs led by naturalists, serving 2,211 participants, and 59 non-RIN programs, which served 3,019 people.

In October 2013, DWR hosted a Take a Warrior Fishing event for 30 participants. This program supports military personnel and their families, with a focus on creating an adaptive, community-based outdoor recreation experience through the sport of fishing. Breakfast was provided by DWR's Delta Field Division.

### San Luis Reservoir State Recreation Area

DWR and its partners, including the Bureau of Reclamation, the San Joaquin River Exchange Contractors Water Authority, the San Luis & Delta-Mendota Water Authority, and California State Parks, hosted 21 special needs children at a C.A.S.T. for Kids fishing event at O'Neill Forebay at the San Luis Reservoir State Recreation Area. The children were treated to a day of fishing with the area's top Delta tournament fishermen.

### Castaic Lake State Recreation Area

The County of Los Angeles Department of Parks and Recreation sponsored the following activities at Castaic Lake State Recreation Area in 2013:

- two Junior Lifeguard Programs for 479 participants ages 9 to 17 who learned life guarding, first aid, CPR skills, and water safety;
- four Aquatic Adventure Camp sessions for 450 participants;
- five moonlight kayak classes with 94 participants, ages 8 and older, who learned about the environment at Castaic Lake, the SWP, water safety, and boating safety;

- "Splash in the Water" events with 477 children ages 7 to 14 who learned about water safety, kayaking, canoeing, standup paddleboarding, and sailing;
- one session of a FamCamp program for 37 participants to teach them about camping, leave-no-trace principles, water safety, and kayaking;
- 41 standup paddleboarding classes for a total of 466 participants every Saturday from May through October, with an average class size of 10 to 25 participants; and
- a C.A.S.T. for Kids fishing event for 37 children with special needs, which was co-hosted by DWR.

### Silverwood Lake State Recreation Area

In 2013, California State Parks sponsored the following activities at Silverwood Lake State Recreation Area:

- Bald Eagle Barge Tours on Saturdays and Sundays from January through March, where monthly eagle counts were taken;
- one Adopt-a-School program for 100 participants;
- a Coastal Cleanup Day with 15 volunteers who cleaned up the lake shoreline;
- the Third Annual Apple Festival, held near the Silverwood Historic Apple Orchard, which included apple picking, demonstrations of an antique apple press, and apple cooking and canning demonstrations. Live music, a barbecue lunch, a raffle, and a preview of exhibits at the Silverwood Lake State Recreation Area Nature Center were available to the 250 participants;
- Earth Day, with approximately 40 volunteers; and
- a C.A.S.T. for Kids fishing event, co-hosted by DWR, which paired 23 children with special needs with experienced fishermen for a day of fishing on Silverwood Lake.



## Lake Perris State Recreation Area

California State Parks sponsored the following activities at Lake Perris State Recreation Area in 2013:

- 12 Junior Ranger Programs, conducted by a State Park Interpreter, for participants ages 3 to 15;
- 12 campfire programs, with an audience of 20 to 65 attendees for each program;
- a 4-week Junior Lifeguard Program for 20 participants, ages 8 to 15, who learned about natural and cultural resources, first aid, CPR, and aquatic safety;
- four Bald Eagle counts;
- three sessions of Aquatic Adventure Camp, co-hosted by DWR, with more than 150 children learning basic first aid, CPR, how to manage basic aquatic emergencies, and swimming strokes, while enjoying a variety of aquatic recreation activities;
- a Holiday Boat Parade with 20 boats, which was enjoyed by 400 visitors;
- a Summer Enhancement Program, in cooperation with the San Bernardino Unified School District, which hosted 500 students and allowed them to visit the lake and participate in swimming, fishing, and outdoor education throughout the summer; and
- a C.A.S.T. for Kids fishing event, co-hosted by DWR and other agencies, which paired 50 children with special needs with experienced fishermen for a day of fishing on the lake.

## Oroville Recreation Plan

The Oroville Facilities, including Lake Oroville State Recreation Area, Oroville Wildlife Area, and adjacent DWR facilities, are operated in conformance with the 1993 Amended Recreation Plan that was approved by the Federal Energy Regulatory Commission (FERC) in its 1994 Order 2100-054. In 2006, DWR and its

Settlement Agreement signatories submitted a new Settlement Agreement Recreation Management Plan (SARMP, March 2006) for FERC approval. The approved SARMP will be implemented when the new hydropower license is issued by FERC, currently expected sometime in 2016 or later.

Additional need-based recreation improvements identified and proposed in the SARMP are anticipated to be constructed after the new FERC license is issued. The new license terms and conditions are expected to be consistent with the proposed SARMP. In the meantime, DWR and its Davis-Dolwig Act (DDA) collaborating partners, California State Parks, California State Parks' Division of Boating and Waterways, and DFW, will continue to operate Oroville Facilities' recreational installations consistent with the existing FERC license (renewed annually) and its associated 1993 Amended Recreation Plan.

## Fish Plantings

In 2013, DFW planted 600,300 fish in SWP reservoirs (see Table 13-2 for details). This was 27.4 percent less than the 826,700 fish planted in 2012. In 2011, DFW planted 761,200 fish; and 538,500 fish were planted in 2010. Over the last 3 years, DFW averaged 729,400 fish planted per year.

## SWP Deliveries for Recreation

DWR has an agreement with California State Parks to provide onshore recreation water at several SWP facilities in an amount prorated to the yearly SWP Table A allocation. Per the 35 percent SWP Table A allocation for 2013, maximum diversion amounts under the onshore recreation agreement were allocated at 35 percent, or a total of 2,375 acre-feet (af), as follows: 963 af at San Luis Reservoir; 140 af at Lake del Valle; 816 af at Castaic Lake and Castaic

**Table 13-2 Fish Planted by the Department of Fish and Wildlife in 2013 (thousands)<sup>a</sup>**

Location and Size	Eagle Lake Trout	Brook Trout	Rainbow Trout	Coho Salmon	Chinook Salmon	Steelhead Trout	Kokanee Salmon	Total for Lake
<b>Antelope Lake</b>								0.2
Catchables			0.2					
<b>Lake Davis</b>								40.2
Fingerlings	16.3							
Catchables			23.9					
<b>Frenchman Lake</b>								155.7
Fingerlings	155.7							
<b>Lake Oroville</b>								91.8
Fingerlings					91.8			
<b>Thermalito Forebay<sup>b</sup></b>								
<b>Thermalito Afterbay</b>								11.0
Fingerlings						11.0		
<b>Lake del Valle</b>								75.9
Fingerlings					20.0		20.0	
Catchables	16.1		19.8					
<b>Los Banos Reservoir<sup>b</sup></b>								
<b>Pyramid Lake</b>								17.7
Catchables			7.0					
Supercatchables			10.7					
<b>Castaic Lake</b>								78.6
Catchables			78.6					
<b>Castaic Lagoon<sup>b</sup></b>								
<b>Silverwood Lake</b>								30.0
Catchables			9.7					
Trophy			20.3					
<b>Lake Perris</b>								99.2
Catchables			99.2					
<b>Total</b>	<b>188.1</b>	<b>0.0</b>	<b>269.4</b>	<b>0.0</b>	<b>111.8</b>	<b>10.3</b>	<b>20.0</b>	<b>600.3</b>

<sup>a</sup> Information provided by DFW, using the following size classes: fingerlings = 16.1 or more fish per pound; sub-catchables = 6.1 to 16 fish per pound; catchables = 1 to 6 fish per pound; super-catchables = 0.99 to 0.34 fish per pound; and trophy = fewer than 0.32 fish per pound.

<sup>b</sup> No fish planted in 2013. Thermalito Forebay was last planted with fish in 2008 and Castaic Lagoon in 2010. They were removed from DFW's list of approved waters due to an environmental impact report and analysis of potential effects of fish stocking on other listed endangered species.

Lagoon; 438 af at Lake Perris; and 18 af at Bethany Reservoir. Actual deliveries under the agreement totaled 751 af as follows: 5 af at San Luis Reservoir; 137 af at Lake del Valle; 196 af at Castaic Lake; 230 af at Lake Perris; 0 af at Bethany Reservoir; and deliveries to California State Parks of 85 af at Silverwood Lake and 98 af at Pyramid Lake.

Details about these deliveries are provided in Chapter 9, Water Contracts and Deliveries.

## Recreation Financing

Prior to 2001, DWR reported capital costs allocated to fish and wildlife enhancement and recreation in Bulletin 132, Appendix D,

*Costs of Recreation and Fish and Wildlife Enhancement (RFWE)*. This report is no longer mandated by the Legislature. DWR initially began reporting recreation capital cost information in this bulletin for fiscal year 2000–2001.

The approach to financing RFWE in connection with the SWP is provided in the DDA (California Water Code [CWC] Sections 11900–11925, 1961) and the Burns-Porter Act (CWC Section 12937, 1959). Additionally, as early as 1953, financing for RFWE was addressed in CWC Sections 233, 345, 346, 12581, and 12582. These statutes declare that recreation at the SWP is a benefit to all the people of California and that the associated costs should be borne by all Californians. While this intent is cited in the DDA, no specific appropriation or funding source was defined. Consequently, Assembly Bill (AB) 12 in 1966, Senate Bill (SB) 1268 in 1970, and the Environmental Water Act, AB 1441 and AB 1442 in 1989, were all enacted to provide the necessary State funding for this SWP purpose. The DDA does, however, explicitly preclude DWR from including RFWE costs in the SWP charges for water and power billed to the public water agencies contracting for SWP water supply.

The Legislature has intermittently appropriated monies to meet State obligations to fund RFWE at the SWP. AB 12 appropriated \$5 million per year to DWR from \$90 million in tidelands oil and gas revenues. By the early 1980s, DWR had expended the entire \$90 million toward funding SWP RFWE obligations. SB 1268 appropriated \$55 million to California State Parks and \$5 million to DFW specifically for their responsibilities under the DDA at SWP facilities. Finally, AB 1442 appropriated \$172 million to reimburse DWR for SWP RFWE costs incurred over the previous 12 years as an offset to DWR's California Water Fund repayment, and an additional \$30 million for SWP RFWE through 1994.

In the fiscal year 2012–2013 State budget, passed by the Legislature and effective July 1, 2012, the DDA was amended to continuously appropriate \$10 million per year to DWR. The funding was sourced from the Harbors and Watercraft Revolving Fund that is funded by fuel taxes at marinas statewide; this continuous SWP RFWE funding is essentially a user-funded source. Of the \$10 million, \$2.5 million per year is for past unreimbursed SWP RFWE costs incurred by DWR through December 31, 2011, and the remaining \$7.5 million per year is primarily intended to fund DWR's ongoing annual joint SWP RFWE costs that are generated through DWR's statutory mandate to allocate SWP costs to their respective purposes, including RFWE. These joint costs are those for facilities such as dams, which were constructed to provide multiple benefits such as flood control, water supply, power generation, and RFWE. The dam, however, cannot be physically separated into discrete elements for cost-sharing purposes, so DWR, by statute, must determine and allocate shares of such facilities to all of the respective purposes. Moreover, and by law (the DDA), the SWP RFWE purpose costs cannot be included in charges for water and power to SWP customers, so the 2012 DDA amendment filled a long-standing shortfall in SWP RFWE funding and will help ensure the great benefit provided to all Californians in the form of 4 million or more visitors per year to SWP facilities with water-focused recreation and sport-fishing opportunities.

The 2012 DDA amendment was the result of several years of close, cooperative solution development that involved the Natural Resources Agency Secretary's Office, the Department of Finance, the Legislative Analyst's Office, legislative staff, DWR, and many of DWR's long-term SWP water supply contracting public water agencies.

Another part of the cooperative solution to the long-standing DDA funding difficulties was concurrence from DWR to reexamine

the joint RFWE allocation for SWP transportation facilities located south of Dos Amigos Pumping Plant. DWR did so, and commencing on January 1, 2013, made revisions to the RFWE allocations described in Table 2 of Appendix B (located at the end of this bulletin).

### **Capital Cost Allocations**

Table 13-3 shows capital costs allocated to RFWE and overall costs of lands acquired for recreation development through 2013. Total capital costs increased by \$4,633,004 since Bulletin 132-13 due to an increase of \$3,724,845 in 2013 and an upward adjustment of \$908,159 in years prior to 2013. The increase in 2013 included \$3,711,774 in joint costs and \$13,071 in specific costs. These costs are budgeted by DWR from funds available for financing project construction costs. Recreation and enhancement costs not reported in this table are budgeted by several State departments and are financed by appropriations from a variety of funds.

**Table 13-3 Recreation and Enhancement Capital Costs of the State Water Project (in dollars)**

Facility	Joint Costs Allocated to Recreation and Enhancement			Specific Costs Allocated to Recreation and Enhancement			TOTAL
	1952-2012 Updated	2013	Subtotal	1952-2012 Updated	2013	Subtotal	
Frenchman Dam and Lake (78.5%) <sup>a</sup>	102,997	0	102,997	0	3,379	106,376	
California Water Resources Development Bond Fund	2,719,877	4	2,719,881	0	49,950	2,769,831	
All Other Funds							
Antelope Dam and Lake (100%) <sup>a</sup>	1,033,261	0	1,033,261	0	3,167	1,036,428	
California Water Resources Development Bond Fund	4,625,993	7	4,626,000	0	201,137	4,827,137	
All Other Funds							
Grizzly Valley Dam and Lake Davis (99.0%) <sup>a</sup>	4,003,092	0	4,003,092	0	204,475	4,207,567	
California Water Resources Development Bond Fund	4,110,157	7	4,110,164	0	554,246	4,664,410	
All Other Funds							
Other Feather River Projects (100%) <sup>a</sup>	0	0	0	0	9	9	
California Water Resources Development Bond Fund	746,161	1	746,162	0	9,921	756,083	
All Other Funds							
Delta Facilities (3.4%) <sup>a</sup>	13,626,647	89,589	13,716,236	0	0	13,716,236	
California Water Resources Development Bond Fund							
All Other Funds							
San Luis Dam and Reservoir O'Neill Forebay and Los Banos Reservoir (3.4%) <sup>a</sup>	988,910	0	988,910	395,284	0	1,384,194	
California Water Resources Development Bond Fund	4,027,901	11,252	4,039,153	867,243	0	4,906,396	
All Other Funds							
California Aqueduct Delta to Dos Amigos P.P. (3.4%) <sup>a</sup>	4,467,667	0	4,467,667	422,681	0	4,890,348	
California Water Resources Development Bond Fund	4,930,844	370,066	5,300,910	-91,879	0	5,209,031	
All Other Funds							
Oroville Division (2.9%) <sup>a</sup>	5,725,216	0	5,725,216	7,809,509	0	13,534,725	
California Water Resources Development Bond Fund	6,262,127	148,130	6,410,257	6,020,505	936	12,431,698	
All Other Funds							
DelValle Dam and Lake Del Valle (48.0%) <sup>a</sup>	10,546,762	0	10,546,762	519,425	0	11,066,187	
California Water Resources Development Bond Fund	4,292,394	85,882	4,378,276	-32,202	0	4,346,074	
All Other Funds							
California Aqueduct Dos Amigos P.P. to Termini (0.4%-32.3%) <sup>a,b</sup>	48,382,162	0	48,382,162	3,880,547	0	52,262,709	
California Water Resources Development Bond Fund	93,282,871	3,006,836	96,289,707	6,680,580	12,135	102,982,422	
All Other Funds							
<b>Total</b>	<b>213,875,039</b>	<b>3,711,774</b>	<b>217,586,813</b>	<b>27,497,977</b>	<b>13,071</b>	<b>245,097,861</b>	

<sup>a</sup> Percentages are the share of Joint Costs.

<sup>b</sup> Specific Costs for Dos Amigos to Termini include \$2,905,649 for Castaic Dam and Lake, \$795,130 for Cedar Springs Dam and Silverwood Lake, and \$5,974,424 for Perris Dam and Lake Perris.







## Chapter 14 Financial Analysis

*Dos Amigos Pumping Plant lifts water 113 feet from the California Aqueduct as it flows south from O'Neill Forebay.*

## Significant Events in 2013

On March 5, the Department of Water Resources (DWR) delivered \$183.960 million of Water System Revenue Bonds, series AM. The proceeds were presold on February 28, 2012, to refinance previously sold bonds and pay bond financing costs.

On March 26, DWR delivered \$45.340 million of Water System Revenue Bonds, series AP. The proceeds were presold on March 12 to refinance commercial paper and to pay bond financing costs.

On June 18, DWR delivered \$120.205 million of Water System Revenue Bonds series AQ. The proceeds were presold on May 21 to refinance commercial paper, finance long-term construction expenditures, and pay bond financing costs.

*Information for this chapter was provided by the State Water Project Analysis Office in conjunction with the Division of Fiscal Services.*



This chapter presents both a summary and a detailed explanation of the State Water Project's (SWP) current financial analysis, capital costs and requirements, revenues and expenses, and bond activities for years 2013 through 2023.

The Department of Water Resources (DWR) performs a financial analysis annually to ensure the SWP financing program will have sufficient funds to meet construction obligations; project operation, maintenance, power, and replacement costs; and debt service payments for bonds expended for construction. The results of the current financial analysis, dated December 31, 2013, are presented in Tables 14-1 and 14-2, located at the end of this chapter. (Please note that, in some instances, the tables and text figures in this chapter may not sum due to rounding.)

Future contingencies may change the financial analysis, some of which include:

- alterations in schedules of currently planned construction for future facilities;
- changes in economic conditions, including changes in interest rates and in SWP water contractor Table A amounts due to changes in amounts of water needed, conserved, or reclaimed;
- development of additional sources of water not foreseen at this time;
- deviations from the assumptions regarding actual rates of price escalations for future construction from those currently assumed for cost estimates;
- increases in capital costs related to additional conservation facilities; and
- outcome of lawsuits now pending before the courts.

## Capital Requirements and Financing

In conducting the current financial analysis, DWR projected future construction costs through the year 2023 plus reimbursement of \$249 million interim financing for prior expenditures will total \$1.81 billion. Special capital requirements for revenue bond financing of these construction costs are projected at \$193 million for a total capital requirement of \$2.0 billion. This projection includes construction and financing costs for the following significant SWP projects planned for completion by 2023:

- Perris Dam remediation;
- Phase II enlargement of the East Branch of the California Aqueduct;
- Phase I improvements to the East Branch Extension;
- Phase II of the East Branch Extension;
- enlargement of and improvement to the South Bay Aqueduct (SBA); and
- a new intake to the North Bay Aqueduct.

Most of these capital requirements will be financed from the projected sale of \$1.96 billion of revenue bonds. The remaining \$45 million will be financed from capital resources revenues and the transfer of excess revenues not needed for operation costs or debt service.

The analysis of capital requirements and financing presented in Table 14-1 does not include the costs and financing of all facilities needed to develop the remaining yield necessary to meet the

total 4.2 million acre-foot contractual commitment to long-term SWP water contractors. Table 14-1 also does not include the costs of associated work essential for realizing full benefits from the SWP, but financed and constructed by local interests or State agencies other than DWR. Those facilities include on-shore recreational developments at SWP facilities and local distribution facilities.

The allocation of capital expenditures for various SWP purposes is detailed in Table 14-3.

## Capital Requirements

Lines 1 through 20 in Table 14-1 show actual and projected SWP capital requirements through 2023. Estimates of future capital expenditures include allowances for construction cost escalation of 5 percent per year from 2014 through 2023. Right-of-way costs are escalated at 4 percent per year from 2014 through 2023. Capital expenditures for the SWP also include requirements other than those for construction, such as disbursements made as part of the Davis-Grunsky Act Program (Line 16) and special capital requirements under revenue bond financing (Line 17). DWR will decide whether to construct facilities only after examining alternatives and completing environmental documentation and other review processes.

*Line 1, Initial Project Facilities*, includes only those facilities completed in the initial construction program, which concluded December 31, 1973 (see Bulletin 132-74, Chapter 2). Additional costs after 1973, and estimated costs of remaining work on the initial SWP facilities, are not included.

*Line 2, North Bay Aqueduct*, consists of the estimated costs for improvements and the historical costs for Phase II. Operational in May 1988, Phase II connected with the Phase I facilities, which were completed in 1968 (Phase I costs are included in the initial

project facilities discussed in Line 1). Phase II included costs for pipelines, pumping plants, and a small reservoir necessary to divert water from the western Delta to Napa and Solano counties for urban use. The improvements consist of replacing the existing tank with two 5-million gallon tanks. Construction of the new tanks began in 2007 and was completed in 2010.

*Line 3, Delta and Suisun Marsh Facilities*, shows historical costs that include planning for general Delta facilities and the previously planned peripheral canal and overland water delivery facilities for the western Delta. Also included are historical planning costs for Suisun Marsh as well as construction costs for the Suisun Marsh Salinity Control Gates and an access road. The projected amounts include projected planning costs plus projected costs for fish screens at Sherman and Twitchell islands.

*Line 4, Final Four Units at Banks Pumping Plant*, includes costs of the final four 1,067 cubic feet per second units, which became operational in spring 1992.

*Line 5, Coastal Branch Aqueduct*, includes all costs for the planning, design, and construction of Phase II of the Coastal Branch of the California Aqueduct. Phase II construction began in October 1993 and was completed in 1997. Water deliveries from Phase II facilities began in July 1997.

*Line 6, West Branch Aqueduct*, shows costs for all facilities on the West Branch except Warne Powerplant. Those costs are included in Line 11.

*Line 7, East Branch Enlargement*, includes expenditures for Phases I and II of the East Branch Enlargement. Phase I included the enlargement share of power plant costs at Mojave Siphon and Devil Canyon. (The remaining power plant costs are included in Line 11.) East Branch Enlargement costs



**Table 14-3 Allocation of Capital Expenditures (in thousands of dollars)**

Facilities and Construction Divisions	Expenditures Incurred Through 2013	Future Expenditures	Total	Preliminary Allocation Among Project Purposes			
				Water Supply and Power Generation	Flood Control <sup>a</sup>	Recreation and Fish and Wildlife Enhancement	Other <sup>b</sup>
<b>Project Construction Expenditures</b>							
Upper Feather Division	19,926	-	19,926	1,558	0	18,368	0
Oroville Division (excludes Small Hydro)	737,196	113,894	851,090	753,420	71,688	25,982	0
Delta Facilities Division	434,047	153,880	587,927	564,882	0	23,045	0
North Bay Aqueduct	110,645	468,063	578,708	578,708	0	0	0
South Bay Aqueduct	388,013	12,332	400,345	376,639	8,293	15,412	0
California Aqueduct							
North San Joaquin Division	290,142	24,206	314,348	303,433	0	10,915	0
San Luis Division	309,343	11,282	320,625	306,638	0	13,987	0
South San Joaquin Division	336,487	12,096	348,583	330,868	0	17,714	0
Tehachapi Division	370,657	14,491	385,149	364,353	0	20,796	0
Mojave Division (excludes Small Hydro)	367,454	8,955	376,409	336,445	0	39,964	0
Santa Ana Division	312,429	135,908	448,337	368,529	0	79,808	0
West Branch	559,630	10,020	569,650	536,784	0	32,866	0
Coastal Branch	494,544	10,002	504,546	504,546	0	0	0
<i>Subtotal, California Aqueduct</i>	<i>3,040,686</i>	<i>226,960</i>	<i>3,267,647</i>	<i>3,051,597</i>	<i>0</i>	<i>216,050</i>	<i>0</i>
Other Project Facilities							
Small Hydroelectric Power							
Generating Facilities	99,938	0	99,938	99,938	0	0	0
Off-Aqueduct Power							
Generating Facilities	491,574	0	491,574	491,574	0	0	0
East Branch Enlargement	461,828	0	461,828	461,828	0	0	0
East Branch Extension	262,478	110,907	373,385	373,385	0	0	0
Coastal Power Allocation	30,708	0	30,708	30,708	0	0	0
Agricultural Drainage Facilities	83,501	17,620	101,121	0	0	0	101,121
Planning and Pre-operations	70,898	30,640	101,538	101,538	0	0	0
Unassigned/Miscellaneous	128,285	430,110	558,395	0	0	0	558,395
<i>Subtotal, Project Construction Expenditures</i>	<i>6,359,725</i>	<i>1,564,404</i>	<i>7,924,129</i>	<i>6,885,775</i>	<i>79,981</i>	<i>298,857</i>	<i>659,516</i>
<b>Other Capital Requirements</b>							
Davis-Grunsky Act Program	130,000	0	130,000	0	0	0	130,000
<b>Total Capital Expenditures</b>	<b>6,489,725</b>	<b>1,564,404</b>	<b>8,054,129</b>	<b>6,885,775</b>	<b>79,981</b>	<b>298,857</b>	<b>789,516</b>

<sup>a</sup> Reflects DWR's allocation to this purpose, irrespective of federal payments.

<sup>b</sup> Includes costs currently unassigned to purpose, planning costs of deleted features of project facilities, initial costs of inventoried items, and costs assigned to the Davis-Grunsky Act Program.

for Phase I, by facility, are presented in Table 14-4. Costs for Alamo Powerplant consist of expenditures for Unit 1 facilities allocated to enlargement. Construction of Unit 2 was deferred.

Work on the draft environmental impact report, mapping, and conceptual design for Phase II of the enlargement began in March 2007 and ceased in 2013 at the request of the participating contractors. Construction has been postponed indefinitely. Project costs include raising the canal embankment and concrete lining, constructing additional siphon barrels, adding bays to check structures, constructing Unit 2 at Alamo Powerplant, and adding two pump/motor units and a discharge line at Pearblossom Pumping Plant.

All costs in Line 7 are allocated to and repaid by the seven Southern California contractors participating in the East Branch Enlargement.

*Line 8, East Branch Improvements*, shows all aqueduct costs on the East Branch not allocated to the enlargement project. Those costs include improvements constructed concurrently with the enlargement work, the reconstruction of the San Bernardino Tunnel Intake, and the construction of the Tehachapi East Afterbay. Costs for power plant construction at Alamo, Mojave Siphon, and Devil Canyon are not included in this line.

*Line 9, East Branch Extension*, shows expenditures for Phases I and II of the extension of the East Branch of the California Aqueduct. The East Branch Extension extends the California Aqueduct east from the Devil Canyon Powerplant to a terminus at Noble Creek near Beaumont in Riverside County. The extension provides water service to the San Geronio Pass Water Agency and the San Bernardino Valley Municipal Water District. Construction of Phase I began in February 1999 and was completed in 2003. Phase I improvements include enlargement of the Crafton Hills

Reservoir and construction of the Yucaipa Connector Pipeline. Construction of this phase is scheduled to be completed in 2014. Phase II will increase the pumping capacity to 100 percent of design capacity. Construction of Phase II began in 2012 and is scheduled to be completed in 2015. All costs in Line 9 will be allocated to and repaid by the two participating contractors.

*Line 10, South Bay Aqueduct Improvements and Enlargement*, shows expenditures for providing additional capacity required to meet increases in water demands for the service area of Alameda County Flood Control and Water Conservation District, Zone 7, and increasing the existing capacity of the SBA to its original design capacity. Construction began in 2006 and is scheduled to be completed in 2014.

*Line 11, Power Generation and Transmission Facilities*, does not include the East Branch Enlargement share of costs for Alamo, Mojave Siphon, and Devil Canyon powerplants shown in Line 7 of Table 14-1. The capital costs for facilities included in Line 11 are shown in Table 14-5.

*Line 12, Additional Conservation Facilities*, shows projected costs to plan and study additional conservation facilities. Specific planning activities and projected spending amounts for 2014 through 2023 are shown in Table 14-6. Expenditures for these items are being reviewed. Construction costs of additional conservation facilities are not included in the financial analysis.

Line 12 does not include the Bay Delta Conservation Plan costs. DWR's share of the Bay Delta Conservation Plan expenditures for preliminary planning and environmental impact report preparation are currently financed by participating contractors.

*Line 13, Agricultural Drainage Facilities*, includes projected costs of the Agricultural Drainage Program. The activities in this

**Table 14-4 East Branch Enlargement Capital Costs by Facility**

<b>Facility</b>	<b>Amount (in millions of dollars)</b>
Aqueduct and Siphons	128.1
Pearblossom Pumping Plant	70.1
Alamo Powerplant	5.0
Mojave Siphon Powerplant	47.3
Devil Canyon Powerplant and Second Afterbay	202.9
<b>Total</b>	<b>453.4</b>

**Table 14-5 Estimated Capital Costs for Power Generation and Transmission Facilities**

<b>Power Plants and Transmission Lines</b>	<b>Amount (in millions of dollars)</b>
<b>Power Plants</b>	
Reid Gardner, Unit 4	314.2
Bottle Rock	120.9
South Geysers	49.6
Devil Canyon	36.8
Warne	84.5
Alamo	44.9
Mojave Siphon	40.9
Hyatt	27.9
Thermalito	77.4
<i>Subtotal</i>	<i>797.1</i>
<b>Transmission Lines</b>	
Midway–Wheeler Ridge	10.7
Geysers–Lakeville	6.9
<i>Subtotal</i>	<i>17.6</i>
<b>Total</b>	<b>814.7</b>

**Table 14-6 Estimated Future Costs for Planning Additional Conservation Facilities**

<b>Activity</b>	<b>Amount (in millions of dollars)</b>
SWP Future Water Supply	30.6
Other Planning Costs	0.0
<b>Total</b>	<b>30.6</b>

program are monitoring, evaluating, reducing, and treating drainage, as well as investigating treatment and reuse of drainage water.

DWR assumes that future costs of the drainage program will be financed by revenue transfers (Line 36).

*Line 14, Other Costs*, includes items such as general design and construction costs, costs of completing operation and maintenance facilities, and costs of other completion activities for the initial facilities of the California Aqueduct. Portions of those costs ultimately will be allocated to California Aqueduct units described in the preceding paragraphs.

*Line 15, Subtotal Project Construction Expenditures*, is the total of Lines 1 through 14.

*Line 16, Davis-Grunsky Act Program Costs*, shows costs of the Davis-Grunsky Act Program, a financial assistance program to provide grants and loans to public agencies for constructing local water projects.

As of December 31, 2013, DWR had disbursed \$130 million (including \$8.5 million for administration) in grants and loans to local agencies throughout the State.

*Line 17, Special Capital Requirements Under Revenue Bond Financing*, presents special capital requirements at the time revenue bonds are sold. The financial analysis assumes that proceeds from any future revenue bonds will be used to pay for bond discounts, bond issuance costs, and debt service reserve requirements.

Information about the application of proceeds to these special requirements for actual and assumed revenue bond sales is presented in Table 14-7.

*Line 18, Total Capital Requirements*, is the total of Lines 15, 16, and 17.

*Line 19, Power Facilities Capital Requirements*, shows the total capital requirements for power facilities included in Line 18.

*Line 20, Water Facilities Capital Requirements*, shows the total capital requirements for water facilities included in Line 18.

## Capital Financing

The SWP was constructed using three general types of financing: Burns-Porter Act, revenue bonds, and capital resources. Lines 21 through 37 of Table 14-1 present specific information about these financing sources.

### Burns-Porter Act

Burns-Porter Act financing is derived from the sale of California Water Resources Development Bonds (general obligation bonds) and State tideland oil revenues deposited in the California Water Fund as authorized by the Burns-Porter Act (California Water Code Sections 12930–12944), approved by voters in November 1960. The Burns-Porter Act authorized an issuance of \$1.75 billion of general obligation State bonds, which are repaid by revenues received according to the water supply contracts. Of that authorization, \$130 million was reserved specifically for the Davis-Grunsky Act Program.

Proceeds from the sale of general obligation bonds were deposited in the California Water Resources Development Bond Fund—Bond Proceeds Account, from which monies were expended only for the construction of SWP facilities and for the Davis-Grunsky Act Program. Approximately 25 percent of the expenditures through 2013 for construction and the Davis-Grunsky Act Program were financed with general obligation bonds.

**Table 14-7 Application of Revenue Bond Proceeds (in millions of dollars)**

Bond Series <sup>a</sup>	Construction Expenditures	Other Capital Requirements				Subtotal	Total Principal Amount of Bonds
		Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Financing and Refunding Costs <sup>b</sup>		
Oroville	218.0	2.6	19.9	1.5	3.0	27.0	245.0
Devil Canyon-Castaic	126.4	0.0	10.0	0.7	2.1	12.8	139.2
Pyramid Series A	74.0	0.0	19.2	1.0	1.6	21.8	95.8
Reid Gardner Series B	146.1	0.0	41.9	0.0	12.0	53.9	200.0
Reid Gardner Series C	91.1	0.0	17.9	7.9	8.1	33.9	125.0
Small Hydro-South Geysers Series D	49.6	0.0	19.9	0.0	5.5	25.4	75.0
Bottle Rock Series E	96.9	0.0	22.0	3.7	2.4	28.1	125.0
Alamo-South Geysers Series F	59.1	0.0	14.2	0.0	1.7	15.9	75.0
Reid Gardner Series G	1.6	0.0	0.0	0.0	237.9	237.9	239.5
Power Facilities Series H	22.2	0.0	0.0	0.0	184.5	184.5	206.7
East Branch Enlargement Series A	108.3	0.0	12.6	0.0	11.1	23.7	132.0
Water System Facilities Series B	97.4	0.0	0.0	0.0	2.6	2.6	100.0
Water System Facilities Series C	0.6	0.0	0.0	0.0	8.4	8.4	9.0
Water System Facilities Series D	95.9	0.0	2.9	0.0	1.2	4.1	100.0
Water System Facilities Series E	0.4	0.0	0.0	0.0	8.6	8.6	9.0
Water System Facilities Series F	0.0	0.0	0.0	0.0	160.0	160.0	160.0
Water System Facilities Series G	86.8	0.0	4.6	0.0	8.6	13.2	100.0
Water System Facilities Series H	85.5	0.0	5.7	0.0	8.8	14.5	100.0
Water System Facilities Series I	158.9	0.0	5.8	0.0	15.3	21.1	180.0
Water System Facilities Series J	0.0	0.0	0.0	0.0	649.8	649.8	649.8
Water System Facilities Series K	88.6	0.0	3.1	0.0	8.3	11.4	100.0
Water System Facilities Series L	0.0	0.0	0.0	0.0	537.8	537.8	537.8
Water System Facilities Series M	166.3	0.0	9.9	0.0	13.8	23.7	190.0
Water System Facilities Series N	137.4	0.0	6.0	0.0	8.6	14.6	152.0
Water System Facilities Series O	156.5	0.0	8.4	0.0	170.1	178.5	335.0
Water System Facilities Series P	141.6	0.0	5.2	0.0	13.2	18.4	160.0
Water System Facilities Series Q	135.0	0.0	8.0	0.0	123.6	131.6	266.6
Water System Facilities Series R	0.0	0.0	0.0	0.0	20.7	20.7	20.7
Water System Facilities Series S	78.2	0.0	5.8	0.0	116.2	122.0	200.2
Water System Facilities Series T	0.0	0.0	0.0	0.0	135.7	135.7	135.7
Water System Facilities Series U	98.7	0.0	5.3	0.0	103.2	108.5	207.2
Water System Facilities Series V	0.0	0.0	0.0	0.0	20.6	20.6	20.6
Water System Facilities Series W	41.0	0.0	1.3	0.0	218.7	220.0	261.0
Water System Facilities Series X	0.0	0.0	0.0	0.0	160.2	160.2	160.2
Water System Facilities Series Y	0.0	0.0	0.0	0.0	329.9	329.9	329.9
Water System Facilities Series Z	0.0	0.0	0.0	0.0	170.7	170.7	170.7
Water System Facilities Series AA	0.0	0.0	0.0	0.0	108.7	108.7	108.7
Water System Facilities Series AB	92.2	0.0	3.9	0.0	93.6	97.5	189.7
Water System Facilities Series AC	13.7	0.0	0.6	0.0	257.7	258.3	272.0
Water System Facilities Series AD	12.4	0.0	0.9	0.0	99.1	100.0	112.4
Water System Facilities Series AE	383.9	0.0	9.5	0.0	239.5	249.0	632.9
Water System Facilities Series AF	33.4	0.0	1.3	0.0	253.1	254.4	287.7
Water System Facilities Series AG	9.9	0.0	0.4	0.0	158.8	159.2	169.1
Water System Facilities Series AH	71.7	0.0	3.6	0.0	22.3	26.0	97.7
Water System Facilities Series AI	0.0	0.0	0.0	0.0	92.3	92.3	92.3



**Table 14-7 Application of Revenue Bond Proceeds (in millions of dollars)***(continued)*

Bond Series <sup>a</sup>	Construction Expenditures	Other Capital Requirements				Subtotal	Total Principal Amount of Bonds
		Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Financing and Refunding Costs <sup>b</sup>		
Water System Facilities Series AJ	69.3	0.0	3.7	0.0	143.9	147.6	216.9
Water System Facilities Series AK	32.0	0.0	0.9	0.0	3.4	4.3	36.3
Water System Facilities Series AL	0.0	0.0	0.0	0.0	105.9	105.9	105.9
Water System Facilities Series AM	0.0	0.0	0.0	0.0	184.0	184.0	184.0
Water System Facilities Series AN	44.8	0.0	0.3	0.0	4.4	4.7	49.5
Water System Facilities Series AO	0.0	0.0	0.0	0.0	317.5	317.5	317.5
Water System Facilities Series AP	47.7	0.0	1.2	0.0	(3.5)	(2.4)	45.3
Water System Facilities Series AQ	122.6	0.0	7.2	0.0	(9.6)	(2.4)	120.2
<i>Subtotal</i>	<i>3,495.6</i>	<i>2.6</i>	<i>283.2</i>	<i>14.8</i>	<i>5,555.5</i>	<i>5,856.1</i>	<i>9,351.8<sup>c</sup></i>
Future East Branch Enlargement Bonds	8.4	0.0	0.6	0.0	0.7	1.3	9.6
Future East Branch Extension Bonds	44.0	0.0	1.9	0.0	2.4	4.4	48.3
Future SBA Enlargement Bonds	9.3	0.0	0.4	0.0	0.5	1.0	10.3
Future Water System Facilities Bonds	1,706.6	0.0	81.8	0.0	104.1	185.8	1,892.5
<b>Total</b>	<b>5,264.0</b>	<b>2.6</b>	<b>367.9</b>	<b>14.8</b>	<b>5,663.3</b>	<b>6,048.6</b>	<b>11,312.5</b>

<sup>a</sup> Actual bond issue for all except future East Branch Enlargement, future East Branch Extension, future South Bay Aqueduct Improvements and Enlargement, and future Water System Facilities bonds.

<sup>b</sup> Bond financing and refunding costs include funds applied to debt service reserve requirements.

<sup>c</sup> Includes \$5,221.4 million of refunded principal, leaving a net principal obligation of \$4,130.4 million.

Monies deposited in the California Water Fund were appropriated for purposes outlined in the Burns-Porter Act. Such deposits were derived from a portion of the State tideland oil revenues, in accordance with a continuing authorization. The California Water Fund was used to finance \$508 million, or approximately 7 percent, of the construction expenditures through 2013.

### Revenue Bonds

Revenue bond financing is derived from the sale of revenue bonds as authorized by the Central Valley Project Act (California Water Code Sections 11100–11925). DWR's authority to issue revenue bonds was confirmed by a decision of the California Supreme Court in 1963 (*Warne v. Harkness*, 60 Cal. 2d 579).

Proceeds from the sale of revenue bonds are deposited in the Central Valley Water Project Construction Fund, from which money is expended only for purposes specified in the resolution authorizing each bond sale. Those purposes, in addition to paying

construction, planning, and right-of-way costs, may include funding the Debt Service Reserve Account, paying interest on bonds, and paying water system operating expenses during a specified period.

As of December 31, 2013, DWR had sold \$9.4 billion of revenue bonds. That amount includes \$5.2 billion of refunded bonds, leaving a total principal obligation of \$4.1 billion.

### Capital Resources

Capital resources financing is derived from payments and appropriations (including a portion of the State tideland oil revenues) authorized by a variety of special contracts, cost-sharing agreements, and legislative actions concerning the SWP, plus accrued interest on these funds. Capital resources revenues are deposited in the Central Valley Water Project Construction Fund and may be expended for interest on general obligation bonds and costs of constructing SWP facilities.

According to DWR's financial management policy, the capital resources revenues are used first to cover any general obligation bond debt service that exceeds available revenues.

## Capital Financing Sources

Capital financing sources include power revenue bonds, East Branch Enlargement bonds, East Branch Extension bonds, SBA Enlargement bonds, water system facilities bonds, initial project facilities bonds, bond proceeds from the Davis-Grunsky Act Program, California Water Fund monies, and capital resources revenues.

*Line 21, Power Facilities Revenue Bonds through Series H*, includes the proceeds applied from power revenue bonds for Oroville, Devil Canyon, Castaic, Warne, Reid Gardner, Bottle Rock, Alamo, South Geysers, and small hydro projects.

No future power revenue bond sales are projected for this financial analysis.

*Line 22, East Branch Enlargement, Current Bonds*, shows that \$474 million of Water System Revenue Bond proceeds has been applied to the East Branch Enlargement project through December 31, 2013. Of this total, \$417 million was used for construction expenditures and \$57 million was used for bond discounts, interest costs, and debt service reserve requirements.

*Line 23, East Branch Enlargement, Future Bonds*, shows DWR's estimate of \$9.6 million of additional bonds required to complete construction of the East Branch Enlargement Phase II.

*Line 24, East Branch Extension, Current Bonds*, shows that \$340 million of Water System Revenue Bond proceeds has been spent through December 31, 2013.

*Line 25, East Branch Extension, Future Bonds*, shows DWR's estimate of

\$48.3 million of additional bonds required to complete construction of the East Branch Extension and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

*Line 26, South Bay Aqueduct Enlargement, Current Bonds*, shows that \$201 million of Water System Revenue Bond proceeds had been spent through December 31, 2013.

*Line 27, South Bay Aqueduct Enlargement, Future Bonds*, shows DWR's estimate of \$10.3 million of additional bonds required to complete construction of the SBA Enlargement and to pay for bond discounts, capitalized interest, and debt service reserve requirements.

*Line 28, Water System Facilities, Current Bonds*, shows that through December 31, 2013, \$1.9 billion of proceeds from Water System Revenue Bonds, Series A through Series AQ, was applied to SWP projects other than the East Branch Enlargement, the East Branch Extension, and the SBA Enlargement. Of this total, \$1.7 billion was used to pay for construction expenditures and \$0.2 billion was used to pay for bond discounts, capitalized interest, and debt service reserve requirements.

*Line 29, Water System Facilities, Future Bonds*, shows that \$1.9 billion of future water revenue bonds is needed to provide \$1.7 billion for construction of SWP water system facilities and \$0.2 billion for bond discounts, interest costs, and debt service reserve requirements.

*Line 30, Subtotal, Water System Revenue Bonds*, is the total of Lines 22 through 29.

*Line 31, Initial Project Facilities Bond Proceeds*, shows the amount of general obligation bonds sold to provide financing costs for initial SWP facilities and for costs of planning certain additional conservation facilities.

Financing initial facilities from general obligation bonds was completed in mid-1972 and totaled \$1.444 billion—\$1.750 billion Burns-Porter Act authorization less \$130 million reserved for the Davis-Grunsky Act Program and \$176 million “offset” for additional conservation facilities. (The Burns-Porter Act provides that to the extent California Water Fund monies are expended, an equal amount of general obligation bonds are reserved [offset] for financing the construction of additional conservation facilities in certain watersheds.)

In mid-1972, the reservation of offset bonds was effectively limited to \$176 million, the total amount of California Water Fund monies expended up to that time. By mid-1972, all general obligation bonds authorized by the Burns-Porter Act had been offset, reserved for the Davis-Grunsky Act Program, or used for SWP construction.

Approximately \$8.5 million of the offset bonds was used to finance planning studies of the Middle Fork Eel River Development. This financial analysis is not based on the use of any offset bond proceeds to meet capital requirements. If, at some time, the State constructs an additional conservation facility, as specified in California Water Code Section 12938, the remaining offset bonds could be sold.

*Line 32, Davis-Grunsky Act Program Bond Proceeds*, shows, for simplification, the entire \$130 million of capital expenditures authorized for the Davis-Grunsky Act Program, according to the Burns-Porter Act, as being funded by proceeds from the sale of general obligation bonds. In fact, \$102 million originated from bond proceeds while \$28 million from the California Water Fund was used for the program in lieu of bond proceeds prior to 1969. Since the final offset in 1994, DWR has accumulated \$44.6 million in capital costs through fiscal year 2006–2007.

*Line 33, Application of California Water Fund Monies*, shows the amount of SWP costs financed under the Burns-Porter Act. The act provides that any available money in the California Water Fund must be used for construction in lieu of proceeds from the sale of general obligation bonds.

When the Burns-Porter Act became effective in late 1960, approximately \$97 million had been accumulated in the fund. That balance, plus subsequent appropriations, interest earnings, and other miscellaneous income to the fund through December 31, 2013, was used to finance a total of \$508 million of SWP costs.

*Line 34, Interim Financing*, shows the net annual amounts of funds flowing into and out of the Water Revenue Commercial Paper Notes program. This program was established in March 1993 to provide an ongoing source of interim financing for water system projects prior to permanent financing from the sale of long-term revenue bonds. DWR has authority to issue up to \$150 million of Water Revenue Commercial Paper Notes. A positive number indicates money borrowed from the program to finance construction costs. A negative number indicates money repaid to the program. The financial analysis assumes that all funds borrowed from the program will be repaid before the end of the analysis period.

*Line 35, Application of Capital Resources Revenues to Construction*, presents the Capital Resources Revenues applied for capital expenditures.

*Line 36, Revenue Transfers Applied*, shows monies assumed to be transferred to the California Water Fund, according to provisions of the Burns-Porter Act, and subsequently reappropriated to construction (see Line 40 of Table 14-2). Projected amounts for the years 2014 through 2023 include funds to finance expenditures for agricultural drainage facilities, as indicated

in Line 13 of Table 14-1, and expenditures for additional conservation facilities, as indicated in Line 12.

*Line 37, Subtotal, Other Capital Financing*, is the total of Lines 31 through 36.

*Line 38, Total Financing of Capital Requirements*, totals Lines 21, 30, and 37.

## Annual Revenues and Expenditures

After financial analysis of SWP operations, DWR concluded that projected payments by contractors and other revenues will be adequate to pay annual operations, maintenance, power, and replacement costs and meet all repayment obligations on funds used to finance SWP construction and other authorized costs during the period 2014 through 2023. Data on annual revenues and expenditures are presented in Table 14-2. A detailed discussion of each line item follows.

### Project Revenues

Project revenues primarily consist of SWP water contractor payments required under their individual long-term water supply contracts. Those revenues are deposited in two funds: the Central Valley Water Project Revenue Fund, where all revenues pledged to revenue bonds are placed, and the California Water Resources Development Bond Fund—Systems Revenue Account, where all other SWP operating revenues are placed. Use of those funds is limited to paying operating costs and debt service; except that revenues in excess of those costs may be deposited to a reserve for future SWP construction, since the California Water Fund has been repaid (see Line 39).

*Line 1, Capital Resources Revenues*, includes the following:

- federal payments for SWP capital expenditures;

- appropriations for capital costs allocated to recreation;
- appropriations for SWP capital expenditures prior to passage of the Burns-Porter Act and according to Senate Bill 261 (1968);
- payments from Los Angeles Department of Water and Power for Castaic power development;
- advances from contractors for construction of requested work;
- investment earnings on the Capital Resources Account; and
- investment earnings on unexpended revenue bond proceeds.

Historically, appropriations for capital costs allocated to recreation and fish and wildlife enhancement have amounted to \$5 million per year and have been appropriated by the California Legislature from the State tideland oil revenues. There have been no appropriations from this fund since 1985.

Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to recreation and fish and wildlife enhancement against the amount the SWP owed to the California Water Fund (see Line 39). Since the final offset in 1994, DWR has accumulated \$56.6 million in capital costs through fiscal year 2012–2013.

In 2012, the Davis-Dolwig Act was amended to appropriate \$10 million per fiscal year from the Harbors and Watercraft Revolving Fund to cover the OMP&R and capital costs allocated to recreation and fish and wildlife enhancement. Starting in fiscal year 2012–2013, \$7.5 million is being appropriated for on-going OMP&R and capital costs and \$2.5 million is being appropriated to reimburse for past unreimbursed OMP&R and capital costs.

*Lines 2 through 12, Water Contractor Payments*, show amounts of the separate elements of water contractor payments.



Amounts in Line 4 also include revenues sufficient to cover costs associated with sales of excess power. Appendix B of this bulletin presents a detailed explanation of payments identified in Lines 2 through 12.

Operations, maintenance, power, and replacement (OMP&R) costs are repaid as they are incurred as part of the Transportation Charge; therefore, no interest charges are included. Construction costs included in the Transportation Charge, and all construction and annual OMP&R costs included in the Delta Water Charge, are to be repaid with interest at the Project Interest Rate.

The Project Interest Rate, as defined in Article 1(r) of the standard provisions of the long-term water supply contracts, is the weighted average of the rates paid on certain securities issued and loans obtained to finance SWP facilities.

According to the original water supply contract provisions, the basis for determining the Project Interest Rate was the weighted average of rates paid on general obligation bond sales only. In 1969, after Oroville Revenue Bonds were issued, the contracts were amended to expand the basis to include rates on all other securities sold and loans obtained thereafter for financing SWP facilities, including revenue bonds (see Bulletin 132-70, page 28).

However, not all proceeds from the sale of revenue bonds are melded into the calculation of the Project Interest Rate. Only those proceeds applied to construction costs (the only application of general obligation bonds permitted by law) and those consumed by the bond discount (a component of the total interest cost of a revenue bond issue) are included in the calculation (see Table 14-8).

Calculations for determining the Project Interest Rate do not include proceeds from the sale of revenue bonds for Off-Aqueduct Power facilities, the East Branch Enlargement facilities, SBA, or water system facilities defined in the Water Revenue Bond Amendment. Table 14-9 lists all bond sales by date and presents basic information used in the calculation of the Project Interest Rate.

Information about contractor water charges in Appendix B, which can be found in the back of this bulletin, is based on known conditions and substantiates DWR's determination of 2015 water charges to be billed on July 1, 2014. However, information about significant differences between the sum of future charges included in Lines 2 through 12 of Table 14-2 and the substantiation of 2014 charges included in Appendix B are as follows.

- Future capital costs in Appendix B are based on the prevailing prices as of December 31, 2013. Those costs presented in the financial analysis include allowances for price escalation.
- Pre-2014 charges in Appendix B represent charges as they should have been, according to currently known conditions. Pre-2014 charges included in Table 14-2 are those actually paid as part of previously determined bills.
- Charges in Appendix B are unadjusted for past overpayments or underpayments. Charges included in Table 14-2 for 2014 and thereafter have been adjusted for any apparent overpayments or underpayments of pre-2014 charges.
- Charges in Appendix B for East Branch Enlargement costs include the amounts for debt service and 25 percent cover for the East Branch Enlargement share of the Series A through Series AQ bonds. Charges in Table 14-2 apply to Series A through Series AQ bonds and also include amounts of the debt service and cover for assumed future bonds.



**Table 14-8 Revenue Bond Proceeds Affecting Project Interest Rate (in millions of dollars)**

Project	Proceeds Included in Project Interest Rate				Subtotal, Proceeds Included in Calculating Project Interest Rate [1] - [2] + [3]	Total Principal Amount of Bonds [5]	Percentage of Total Amount Included in Calculating Project Interest Rate [4] / [5]
	Applied to Construction Costs [1]	Less Portion of Proceeds Derived from Interest Earnings Prior to Delivery of Bonds [2]	Plus Bond Financing and Refunding Costs [3]				
Devil Canyon-Castaic Project Revenue Bonds	125.3	1.5	1.4		125.2	139.2	90
Pyramid Project Revenue Bonds (Series A)	71.2	0.5	1.1		71.8	95.8	75
Alamo Project Bond Anticipation Note	16.8	0.1	0.3		17.0	24.4	70
Small Hydro Project I Revenue Bonds (Series D)	25.4	0.2	1.5		26.7	37.5	71
Alamo Project Revenue Bonds (Series F)	38.9	0.3	0.7		39.3	50.0	79
Power Facilities Revenue Bonds (Series H)							
Pyramid Project	5.0	0.0	0.1		5.1	5.1	100
Alamo Project	1.7	0.0	0.0		1.7	1.7	100
Small Hydro Project I	25.2 <sup>a</sup>	0.2	0.4		25.4	35.6	71
Water System Revenue Bonds (Series J)							
Pyramid Project	0.0	0.0	75.9 <sup>b</sup>		75.9	99.2 <sup>b</sup>	77
Alamo Project	0.0	0.0	45.6 <sup>b</sup>		45.6	57.1 <sup>b</sup>	80
Small Hydro Project I	0.0	0.0	27.8 <sup>b</sup>		27.8	38.8 <sup>b</sup>	72
Water System Revenue Bonds (Series L)							
Small Hydro Project I	0.0	0.0	1.5 <sup>b</sup>		1.5	2.1 <sup>b</sup>	71
Water System Revenue Bonds (Series Q)							
Pyramid Project	0.0	0.0	3.0 <sup>b</sup>		3.0	3.9 <sup>b</sup>	77
Alamo Project	0.0	0.0	4.8 <sup>b</sup>		4.8	6.0 <sup>b</sup>	80
Water System Revenue Bonds (Series S)							
Pyramid Project	0.0	0.0	8.0 <sup>b</sup>		8.0	10.4 <sup>b</sup>	77
Alamo Project	0.0	0.0	7.6 <sup>b</sup>		7.6	9.5 <sup>b</sup>	80
Water System Revenue Bonds (Series U)							
Pyramid Project	0.0	0.0	2.4 <sup>b</sup>		2.4	3.2 <sup>b</sup>	75
Alamo Project	0.0	0.0	3.2 <sup>b</sup>		3.2	4.0 <sup>b</sup>	80
Water System Revenue Bonds (Series W)							
Pyramid Project	0.0	0.0	27.7 <sup>b</sup>		27.7	36.0 <sup>b</sup>	77
Alamo Project	0.0	0.0	11.8 <sup>b</sup>		11.8	14.7 <sup>b</sup>	80
Small Hydro Project (construction)	3.4	0.0	0.0		3.4	3.7	92
Small Hydro Project (refunding)	0.0	0.0	16.3 <sup>b</sup>		16.3	22.7 <sup>b</sup>	72
Water System Revenue Bonds (Series X)							
Pyramid Project	0.0	0.0	8.5 <sup>b</sup>		8.5	11.0 <sup>b</sup>	77
Alamo Project (Series H refunding)	0.0	0.0	0.3 <sup>b</sup>		0.3	0.3 <sup>b</sup>	100
Alamo Project (Series F refunding)	0.0	0.0	3.9 <sup>b</sup>		3.9	4.9 <sup>b</sup>	79
Small Hydro Project	0.0	0.0	4.6 <sup>b</sup>		4.6	6.4 <sup>b</sup>	72

<sup>a</sup> Amount consists of 71 percent of proceeds deposited in escrow to refund portion of Series D bonds (\$35.1 million plus deposits to construction account [\$0.3 million]).

<sup>b</sup> Represents amount of principal used to refund portions of prior bond issues.

**Table 14-9 Actual Bond Sales and Project Interest Rates, by Date of Sale**

Bond Sales	Date of Sale	Delivery Date	Dollar-Years <sup>a</sup> (thousands)	Interest Cost (thousands)	Issue Interest Rate <sup>b</sup> (percent)	Project Interest Rate <sup>c</sup> (percent)
\$ 50,000,000 Bond Anticipation Notes	11/21/63	11/21/63	26,944	531	1.971	1.971
\$100,000,000 Series A Water Bonds	2/18/64	2/18/64	3,402,000	119,750	3.520	3.508
\$ 50,000,000 Series B Water Bonds	5/05/64	5/05/64	1,726,000	60,986	3.533	3.516
\$100,000,000 Series C Water Bonds	10/07/64	10/07/64	3,452,000	123,764	3.585	3.544
\$100,000,000 Series D Water Bonds	2/16/65	2/16/65	3,497,900	122,403	3.499	3.531
\$100,000,000 Series E Water Bonds	11/23/65	11/23/65	3,497,900	130,029	3.717	3.573
\$100,000,000 Series F Water Bonds	6/08/66	6/08/66	3,497,900	137,359	3.927	3.638
\$100,000,000 Series G Water Bonds	11/22/66	11/22/66	3,497,900	143,788	4.111	3.711
\$100,000,000 Series H Water Bonds	3/21/67	3/21/67	3,497,900	129,261	3.695	3.709
\$100,000,000 Series J Water Bonds	7/18/67	7/18/67	3,497,900	143,199	4.094	3.754
\$100,000,000 Series K Water Bonds	11/14/67	11/14/67	3,497,900	163,887	4.685	3.853
\$150,000,000 Revenue Bonds, Oroville Division, Series A	4/03/68	4/03/68	5,228,700	270,289	5.169	
\$100,000,000 Series L Water Bonds	7/11/68	7/11/68	3,497,900	166,918	4.772	3.941
\$100,000,000 Series M Water Bonds	10/22/68	10/22/68	3,497,900	169,989	4.860	4.021
\$ 94,995,000 Revenue Bonds, Oroville Division, Series B	4/01/69	4/01/69	3,423,460	195,902	5.722	
\$ 46,761,000 Cumulative 1970 General Fund Borrowing, repaid 7/10/70	-		4,938	346	7.007	
\$200,000,000 Series N and P Bond Anticipation Notes	6/16/70	6/16/70	200,000	11,660	5.830	4.030
\$100,000,000 Series N Water Bonds	2/02/71	2/02/71	3,447,900	190,292	5.519	4.148
\$100,000,000 Series Q Bond Anticipation Notes	3/10/71	3/10/71	100,000	2,349	2.349	4.143
\$100,000,000 Series P Water Bonds	4/21/71	4/21/71	3,397,900	193,377	5.691	4.255
\$150,000,000 Series Q and R Water Bonds	11/09/71	11/09/71	5,171,850	265,734	5.138	4.342
\$ 40,000,000 Series S Water Bonds	3/28/72	3/28/72	1,399,160	76,509	5.468	4.371
\$139,165,000 Devil Canyon-Castaic Revenue Bonds	8/08/72	8/08/72	4,776,204	258,839	5.419	4.457
\$ 10,000,000 Series T Water Bonds	3/20/73	3/20/73	185,265	9,491	5.123	4.459
\$ 10,000,000 Series U Water Bonds	1/13/76	1/13/76	158,750	8,731	5.500	4.462
\$ 10,000,000 Series V Water Bonds	11/15/77	11/15/77	158,750	7,573	4.770	4.462
\$ 95,800,000 Pyramid Hydroelectric Revenue Bonds	10/23/79	10/23/79	2,260,072	172,495	7.632	4.584
\$150,000,000 Reid Gardner Project, Series A Bond Anticipation Notes	7/1/81	7/1/81	347,906	29,572	8.500	
\$ 75,600,000 Bottle Rock Project, Bond Anticipation Notes	12/1/81	12/1/81	264,600	25,137	9.500	
\$ 24,400,000 Alamo Project, Bond Anticipation Notes	12/1/81	12/1/81	24,266	2,305	9.499	4.589
\$200,000,000 Reid Gardner Project, Series B Revenue Bonds	7/07/82	7/07/82	4,623,137	553,793	11.979	
\$125,000,000 Reid Gardner Project, Series C Revenue Bonds	11/16/82	11/16/82	2,720,045	255,744	9.402	
\$ 37,500,000 Small Hydro Project I, Series D Revenue Bonds	11/16/82	11/16/82	837,769	84,587	10.097	4.666
\$ 37,500,000 South Geysers Project, Series D Revenue Bonds	11/16/82	11/16/82	930,325	90,021	9.676	
\$125,000,000 Bottle Rock Project, Series E Revenue Bonds	4/27/83	4/27/83	2,624,805	225,102	8.576	
\$ 50,000,000 Alamo Project, Series F Revenue Bonds	4/27/83	4/27/83	1,190,763	100,836	8.468	4.727
\$ 25,000,000 South Geysers Project, Series F Revenue Bonds	4/27/83	4/27/83	608,550	52,578	8.640	
\$239,505,000 Reid Gardner Project, Series G Revenue Bonds	3/15/85	3/15/85	4,524,136	425,840	9.413	
\$206,690,000 Power Facilities Series H Revenue Bonds	6/20/86	6/20/86	4,430,520	347,745	7.849	4.713
\$132,000,000 East Branch Enlarg., Series A Water System Revenue Bonds	7/15/86	7/15/86	3,427,165	254,915	7.438	
\$100,000,000 Series B Water System Revenue Bonds	5/05/87	5/05/87	2,564,012	194,817	7.598	
\$ 9,000,000 Series C Water System Revenue Bonds	12/01/87	12/01/87	324,000	31,995	9.875	
\$100,000,000 Series D Water System Revenue Bonds	6/14/88	6/14/88	2,640,510	201,253	7.622	
\$ 9,000,000 Series E Water System Revenue Bonds	11/29/88	12/5/88	324,000	31,995	9.875	
\$160,030,000 Series F Water System Revenue Bonds	3/15/89	4/20/89	2,779,838	189,261	6.808	

**Table 14-9 Actual Bond Sales and Project Interest Rates, by Date of Sale**

Bond Sales	Date of Sale	Delivery Date	Dollar-Years <sup>a</sup> (thousands)	Interest Cost (thousands)	Issue Interest Rate <sup>b</sup> (percent)	Project Interest Rate <sup>c</sup> (percent)
\$100,000,000 Series G Water System Revenue Bonds	3/06/90	3/06/90	2,434,175	172,277	7.077	
\$100,000,000 Series H Water System Revenue Bonds	1/10/91	1/10/91	2,459,172	168,857	6.866	
\$180,000,000 Series I Water System Revenue Bonds	5/14/91	5/14/91	4,366,680	294,090	6.735	
\$649,835,000 Series J Water System Revenue Bonds	1/16/92	1/28/92	12,422,222	745,198	5.999	
\$100,000,000 Series K Water System Revenue Bonds	5/12/92	6/4/92	2,366,783	147,064	6.214	
\$ 9,000,000 Series W Water Bonds	8/19/92	8/19/92	95,250	6,172	6.480	4.621
\$537,830,000 Series L Water System Revenue Bonds	5/19/93	6/02/93	11,414,859	640,518	5.611	4.620
\$ 2,000,000 Series X Water Bonds	9/01/93	9/01/93	26,000	1,247	4.796	4.621
\$ 1,400,000 Series Y Water Bonds	11/30/94	11/30/94	19,483	1,249	6.411	
\$190,000,000 Series M Water System Revenue Bonds	12/9/93	12/21/93	3,911,846	194,981	4.984	
\$152,000,000 Series N Water System Revenue Bonds	3/03/95	3/14/95	2,241,606	122,658	5.472	
\$335,000,000 Series O Water System Revenue Bonds	12/05/95	12/20/95	7,528,890	375,667	4.990	
\$160,000,000 Series P Water System Revenue Bonds	5/07/96	5/22/96	3,553,823	204,524	5.755	
\$266,630,000 Series Q Water System Revenue Bonds	11/05/96	12/04/96	5,481,815	299,846	5.470	4.620
\$ 20,700,000 Series R Water System Revenue Bonds	3/10/97	3/12/97	564,125	36,627	6.493	
\$200,205,000 Series S Water System Revenue Bonds	7/30/97	8/13/97	4,093,110	203,755	4.978	4.615
\$135,665,000 Series T Water System Revenue Bonds	7/30/97	3/04/98	1,310,620	66,942	5.108	
\$207,180,000 Series U Water System Revenue Bonds	11/19/98	12/01/98	4,032,075	200,758	4.979	
\$ 20,580,000 Series V Water System Revenue Bonds	11/19/98	12/01/98	525,100	32,819	6.250	
\$260,995,000 Series W Water System Revenue Bonds	5/01/01	5/17/01	3,659,312	195,822	5.351	4.613
\$160,225,000 Series X Water System Revenue Bonds	5/01/02	6/04/02	2,732,785	139,109	5.090	4.610
\$329,885,000 Series Y Water System Revenue Bonds	7/25/02	3/05/03	4,422,973	222,654	5.034	
\$170,655,000 Series Z Water System Revenue Bonds	10/01/02	10/16/02	1,706,132	75,696	4.437	
\$108,705,000 Series AA Water System Revenue Bonds	10/04/02	3/05/03	2,114,341	104,220	4.929	
\$189,625,000 Series AB Water System Revenue Bonds	3/09/04	3/18/04	4,344,942	173,788	4.000	
\$272,070,000 Series AC Water System Revenue Bonds	12/15/04	1/06/05	4,479,436	209,150	4.669	
\$112,390,000 Series AD Water System Revenue Bonds	6/14/05	7/07/05	1,827,449	90,461	4.950	4.608
\$632,890,000 Series AE Water System Revenue Bonds	4/23/08	5/01/08	8,884,000	436,216	4.910	
\$287,735,000 Series AF Water System Revenue Bonds	3/11/09	3/19/09	2,980,895	431,199	14.465	
\$169,115,000 Series AG Water System Revenue Bonds	11/17/09	12/02/09	2,907,605	311,889	10.727	
\$ 97,675,000 Series AH Water System Revenue Bonds	10/27/10	11/09/10	1,432,014	72,176	5.040	4.610
\$ 92,275,000 Series AI Water System Revenue Bonds	10/27/10	9/07/11	698,716	34,936	5.000	
\$216,930,000 Series AJ Water System Revenue Bonds	10/06/11	10/13/11	2,080,429	100,663	4.839	
\$ 36,370,000 Series AK Water System Revenue Bonds	2/28/12	3/13/12	495,566	23,466	4.735	
\$105,875,000 Series AL Water System Revenue Bonds	2/28/12	9/05/12	739,447	36,972	5.000	
\$183,960,000 Series AM Water System Revenue Bonds	2/28/12	3/05/13	1,440,539	72,027	5.000	
\$ 49,525,000 Series AN Water System Revenue Bonds	9/19/12	9/27/12	646,489	31,783	4.916	
\$317,505,000 Series AO Water System Revenue Bonds	9/19/12	9/27/12	2,830,185	71,219	2.516	
\$45,340,000 Series AP Water System Revenue Bonds	3/12/13	3/26/13	621,111	25,008	4.026	
\$120,205,000 Series AQ Water System Revenue Bonds	5/21/13	6/18/13	2,120,496	85,993	4.055	
<b>Total</b>			<b>224,458,230</b>	<b>13,121,641</b>		
<b>Portion allocated to Project Interest Rate</b>			<b>63,903,487</b>	<b>2,945,789</b>	<b>4.610</b>	<b>4.610</b>

<sup>a</sup> A unit equivalent to one dollar of principal amount outstanding for one year.

<sup>b</sup> The total interest cost (without regard to discounts paid or to premiums received) divided by the total dollar-years, expressed as a percent.

<sup>c</sup> Cumulative interest costs divided by cumulative dollar-years, expressed as a percent. (Excluding Oroville Division bonds and revenue bonds for Off-Aqueduct Power Facilities, East Branch Enlargement Facilities, East Branch Extension Facilities, Water System Facilities as defined in the Water Revenue Bond Amendment, Coastal Extension Facilities, or South Bay Aqueduct Enlargement Facilities.)

- The water revenue bond surcharge in Appendix B applies only to the Series B through Series AQ bonds. Surcharge values included in Table 14-2 apply to Series B through Series AQ bonds and to assumed future issues required to finance SWP construction costs included in Table 14-1.

*Line 13, Subtotal, Water Contractor Payments,* is the total of Lines 2 through 12.

*Line 14, Revenue Bond Cover Adjustments,* represents the credit to contractors resulting from the cover of 25 percent of the annual debt service for Power Facilities Revenue Bonds and Water System Revenue Bonds. Cover is collected as required by the bond resolutions to provide security to the bondholders. If not needed to meet annual bond service, the cover is credited to the contractors in the following year. The annual charges for the following cost components include an amount for bond cover:

- minimum OMP&R component of the Transportation Charge for Off-Aqueduct Power Facilities;
- Water System Revenue Bond Surcharge;
- capital cost component of the Transportation Charge for East Branch Enlargement Facilities;
- capital cost component of the Transportation Charge for Coastal Branch Extension Facilities;
- capital cost component of the Transportation Charge for East Branch Extension Facilities;
- capital cost component of the Transportation Charge for Tehachapi Afterbay; and
- capital cost component of the Transportation Charge for SBA Enlargement.

*Line 15, Rate Management Adjustments,* shows the projected amount of revenue reductions allocated to contractors after

repayment of the California Water Fund (see Line 39). Under provisions of the Monterey Amendment, the reduction amount allocated to agricultural contractors is deposited into a trust fund to stabilize payments in water-short years. The urban contractor allocation is applied as a direct reduction in charges.

*Line 16, Federal Payments for Project Operating Costs,* shows federal payments made in accordance with the December 31, 1961, agreement between California and the United States providing for DWR to operate and maintain the San Luis Joint-Use Facilities. According to the January 12, 1972, supplement to the agreement, the Bureau of Reclamation (Reclamation) initially paid 45 percent of operations, maintenance, and replacement (OM&R) costs for those activities. (The percentage does not apply to power costs; Reclamation and DWR each provide their own power to pump water through the joint facilities.)

The percentage paid by Reclamation is periodically reviewed by Reclamation and DWR. The most recent review of the percentage paid by Reclamation was completed in 1987 and resulted in a federal share of 44.09 percent. The amounts in Line 16 are based on the assumption that the federal share will continue at this level for calendar years 2014 through 2023.

*Line 17, Appropriations for Operating Costs Allocated to Recreation,* shows appropriations made under the Davis-Dolwig Act. In passing the Davis-Dolwig Act, the California Legislature declared its intent that, except for funds provided according to Assembly Bill 12 (1966), DWR's budget will include appropriations of monies from the General Fund necessary for enhancement of fish and wildlife and recreation in connection with State water projects.

Annual OMP&R costs allocated to recreation and fish and wildlife enhancement are to be paid by annual appropriations from

the General Fund. Through fiscal year 1982–1983, these appropriations totaled \$16.7 million. No additional appropriations have been made from this fund since fiscal year 1982–1983.

Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to recreation and to fish and wildlife enhancement against the amount the SWP owed to the California Water Fund (see line 39). Since the final offset in 1994, DWR has accumulated \$166.7 million in OMP&R costs through fiscal year 2012–2013.

In 2012, the Davis-Dolwig Act was amended to appropriate \$10 million per fiscal year from the Harbors and Watercraft Revolving Fund to cover the OMP&R and capital costs allocated to recreation and fish and wildlife enhancement. Starting in fiscal year 2012–2013, \$7.5 million is being appropriated for on-going OMP&R and capital costs and \$2.5 million is being appropriated to reimburse for past unreimbursed OMP&R and capital costs.

*Line 18, Davis-Grunsky Loan Repayments*, shows the repayments by local agencies of \$70.9 million of loans disbursed as of December 31, 2013. Repayment on any future loans was assumed to be beyond the period covered by the financial analysis.

*Line 19, Revenue Bond Proceeds*, includes bond proceeds classified as special reserves according to the description of revenue bond financing in Line 17 of Table 14-1. Those proceeds, used for capitalized OMP&R costs, revenue bond debt service, and debt service reserves, are not classified as revenue but are included in this line to simplify the financial presentation.

*Line 20, Interest Earnings on Operating Revenues*, includes interest earnings on unexpended proceeds from the sale of general obligation bonds, interest on

operating reserves, and other short-term investment earnings on SWP revenues.

*Line 21, Oroville-Thermalito Payments*, shows payments from Pacific Gas & Electric Company, Southern California Edison, and San Diego Gas & Electric Company for power generation at the Oroville facilities. Those utilities purchased all power generation from Hyatt and Thermalito powerplants before April 1, 1983, in accordance with a power sale contract dated November 29, 1967. The historic amount includes the amounts of final settlement of payments made according to the contract.

*Line 22, Miscellaneous Revenues*, includes all other operating revenues not included in Lines 2 through 21.

*Line 23, Subtotal, Other Revenues*, is the total of Lines 16 through 22.

*Line 24, Total Operating Revenues*, is the total of Lines 13, 14, 15, and 23.

*Line 25, Total Operating Revenues and Capital Resources Revenues*, is the total of Lines 1 and 24.

## Project Expenses

Project expenses include the following:

- operations, maintenance, and power costs;
- deposits to replacement reserves;
- deposits to special reserves;
- capital resources expenditures; and
- debt service.

Revenue bond proceeds earmarked for debt service during construction and the first year's operating expenses are deposited in the Central Valley Water Project Construction Fund and disbursed in accordance with resolutions authorizing the issuance of such bonds.



Water contractor revenues associated with operating costs and debt service attributable to projects financed by revenue bonds are deposited in the Central Valley Water Project Revenue Fund for appropriate disbursement. All other operating revenues are deposited in the California Water Resources Development Bond Fund—Systems Revenue Account and are disbursed in accordance with the following four priorities of use, as specified in the Burns-Porter Act:

- SWP OMP&R costs;
- general obligation bond debt service;
- repayment of expenditures from the California Water Fund; and
- deposits to a reserve for future SWP construction.

Project expenses are presented in Lines 26 through 36 of Table 14-2.

*Line 26, Project Operations, Maintenance, Power, and Replacement Costs*, shows the OMP&R portion of the historical and projected costs presented in Table 14-10.

Table 14-10 and Line 26 of Table 14-2 also include the amounts of the operations and maintenance costs for the federal share of joint facilities and those OMP&R costs allocated to recreation, which are intended to be offset by revenues listed in Lines 16 and 17.

Allowances for cost escalations are included in OMP&R costs through 2013. Allowances for additional long-term price escalations in the future are not included in these estimates, because changes in OMP&R costs do not substantially affect the overall results of the financial analysis. (For the most part, changes in OMP&R costs cause direct offsetting changes in operating revenues.)

Power costs make up the largest component of annual operating expenses for the SWP. Assumptions about future power sources and costs are discussed in Chapter 10,

Power Resources. Line 26 also includes costs associated with power transactions that result in the sale of power not required for the delivery of water.

*Line 27, Deposits to Replacement Reserves*, shows funds set aside as required by contract for replacing existing SWP facilities. By December 31, 2013, a net deposit (which includes returned deposits) of \$86.8 million had been made. \$76.3 million had been spent for replacement costs. The balance of the replacement reserve as of that date was \$31.4 million.

*Line 28, Deposits to Special Reserves Under Revenue Bond Financing*, includes two significant components: special reserve deposits related to revenue bonds and capital resources revenue carryover from prior years used for construction in the current year. Special reserve deposits are the net of several income and expenditure items. Income items related to revenue bonds are:

- proceeds set aside to pay bond interest during construction (capitalized interest);
- proceeds set aside for first year operating costs (capitalized operations and maintenance);
- water contractor payments or bond proceeds set aside for debt service reserves;
- water contractor payments for revenue bond cover requirements; and
- deposits to and withdrawals from operating reserves to meet day-to-day cash flow requirements.

The 1952–2013 column also includes advances to DWR’s revolving fund for working funds to purchase mobile equipment and to meet day-to-day operating expenses.

The expenditure items related to revenue bonds include:

- debt service cover payments returned to contractors;



- debt service reserve interest payments returned to contractors;
- surplus account funds returned to contractors or applied to meet expenses;
- total capitalized interest paid out; and
- total capitalized operations and maintenance paid out.

Special reserves, reduced over time as reserved amounts, are used for their respective purposes. The amount indicated each year in Line 28 reflects the change from the previous year. A negative number indicates a withdrawal of special reserves to meet expenses, while a positive number indicates a deposit.

*Line 29, Capital Resources Expenditures*, includes the amount of capital resources revenues applied to construction that is shown in Line 35 of Table 14-1. In Table 14-2, these expenditures are funded out of withdrawals from the reserves in Line 28 and do not affect net revenues shown in Line 38.

*Lines 30 and 31, Payment of Debt Service on Bonds Sold through December 31, 2013*, show the total principal and interest payments, respectively, on bonds sold to date. Table 14-11, at the end of this chapter, summarizes payments on general obligation bonds (Series A through Y water bonds), power revenue bonds by project, and water system revenue bonds (Series A through AQ).

*Lines 32 and 33, Payments on Projected Future Water Bonds*, include the projected annual bond debt service amounts for future water revenue bonds included on Lines 23, 25, 27, and 29 of Table 14-1 for the East Branch Enlargement, East Branch Extension, SBA Enlargement, and other water system facilities. Assumptions about the bond debt service on these future bonds are that interest costs for the water revenue bonds average 4.5 percent; and that bonds are to be

repaid by the end of the project repayment period (2035) or sooner, with maturities commencing in the year following the date of sale and with equal annual bond debt service for the principal repayment period.

*Lines 34 and 35, Total Payments of Bond Debt Service*, show the total of principal payments indicated on Lines 30 and 32, and the total of interest repayments indicated on Lines 31 and 33.

*Line 36, Subtotal, Bond Debt Service*, is the total of Lines 34 and 35.

*Line 37, Total Operating Expenses and Bond Debt Service*, is the total of Lines 26, 27, 28, 29, and 36.

*Line 38, Net System Revenues*, shows the annual amounts of revenues remaining after the payment of operating costs and bond debt service costs.

*Line 39, California Water Fund Repayment*, shows the total amount of repayments made to the California Water Fund to reimburse the fund for monies expended for construction of the State Water Resources Development System.

Repayment of the California Water Fund was completed in 1998. The \$508 million includes the \$306 million of repayments shown in Line 39 and the \$202 million of reimbursement that was credited to the SWP as offsets for recreation and fish and wildlife enhancement expenditures.

*Line 40, Revenues Used for Capital Expenditures*, includes the amounts required annually for financing scheduled capital expenditures. Revenues not needed for operating costs or bond debt services are available for financing SWP capital expenditures.

## Future Costs of Water Service

Estimates of future water costs are useful to contractors for short-range and long-range planning of water needs, operations, and budgets. Unit water charges shown in Table 14-12 represent estimated costs of water delivery by service area for calendar years 2015 and 2020. The unit rates include costs of existing and future SWP facilities accounted for in Table 14-1 and Table 14-7. The unit water charges are based on the assumption that in 2015 and 2020, the SWP will be able to deliver the entire amount of water requested by each contractor. The unit water charges included in Table 14-12 are listed both as 2015 dollars and as escalated rates reflecting assumed future inflation of 4.5 percent from 2015 through 2020.

**Table 14-12 Estimated Unit Water Charges for 2015 and 2020, by Service Area (in dollars per acre-foot)**

Service Area and Charge	2015	2020
	(in 2015 dollars)	(in 2020 dollars)
<b>Feather River Area</b>		
Capital; Operations, Maintenance, and Replacement (OM&R)	283	319
<b>North Bay Area</b>		
Capital; OM&R	413	486
Power	25	36
<b>Total</b>	<b>438</b>	<b>522</b>
<b>South Bay Area</b>		
Capital; OM&R	299	362
Power	59	62
<b>Total</b>	<b>358</b>	<b>424</b>
<b>Coastal Area</b>		
Capital; OM&R	1,120	1,404
Power	165	176
<b>Total</b>	<b>1,285</b>	<b>1,580</b>
<b>San Joaquin Area</b>		
Capital; OM&R	169	198
Power	31	29
<b>Total</b>	<b>200</b>	<b>227</b>
<b>Southern California Area</b>		
Capital; OM&R	351	391
Power	189	202
<b>Total</b>	<b>540</b>	<b>593</b>





**Table 14-1 Capital Requirements and Financing, December 31, 2013 (in thousands of dollars)**

Line Number/Item	Calendar Year												
	1952-2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2014-2023	1952-2023
<b>Capital Requirements</b>													
1. Initial Project Facilities	2,202,316	0	0	0	0	0	0	0	0	0	0	0	2,202,316
2. North Bay Aqueduct	112,603	3,535	1,528	30,000	55,000	109,000	161,000	89,000	19,000	0	0	468,063	580,666
3. Delta and Suisun Marsh Facilities	296,906	20,718	28,162	12,500	15,000	15,000	15,000	13,500	12,500	11,500	10,000	153,880	450,786
4. Final 4 Units at Banks Pumping Plant	43,673	0	0	0	0	0	0	0	0	0	0	0	43,673
5. Coastal Branch Aqueduct	511,279	0	0	0	0	0	0	0	0	0	0	0	511,279
6. West Branch Aqueduct	210,566	0	0	0	0	0	0	0	0	0	0	0	210,566
7. East Branch Enlargement	461,828	0	0	0	0	0	0	0	0	0	0	0	461,828
8. East Branch Improvements	407,381	721	472	0	0	0	0	0	0	0	0	1,193	408,574
9. East Branch Extension	262,478	72,815	36,408	1,684	0	0	0	0	0	0	0	110,907	373,385
10. South Bay Aqueduct	256,412	6,033	6,299	0	0	0	0	0	0	0	0	12,332	268,744
11. Power Generation and Transmission Facilities	814,650	0	0	0	0	0	0	0	0	0	0	0	814,650
12. Additional Conservation Facilities	164,462	3,064	3,064	3,064	3,064	3,064	3,064	3,064	3,064	3,064	3,064	30,640	195,102
13. Agricultural Drainage Facilities	83,501	1,762	1,762	1,762	1,762	1,762	1,762	1,762	1,762	1,762	1,762	17,620	101,121
14. Other Costs	531,669	76,919	155,597	212,038	166,221	88,554	52,808	8,790	5,220	3,340	284	769,771	1,301,440
15. <i>Subtotal, Project Construction Expenditures</i>	6,359,725	185,567	233,290	261,048	241,047	217,380	233,634	116,116	41,546	19,666	15,110	1,564,404	7,924,130
16. Davis-Grunsky Act Program Costs	130,000	0	0	0	0	0	0	0	0	0	0	0	130,000
17. Special Capital Requirements Under Revenue Bond Financing	576,370	26,926	29,852	30,103	29,325	25,300	27,438	16,130	4,200	1,900	1,278	192,452	768,822
<b>18. Total Capital Requirements</b>	<b>7,066,095</b>	<b>212,493</b>	<b>263,142</b>	<b>291,151</b>	<b>270,372</b>	<b>242,680</b>	<b>261,072</b>	<b>132,246</b>	<b>45,746</b>	<b>21,566</b>	<b>16,388</b>	<b>1,756,856</b>	<b>8,822,952</b>
19. Power Facilities Capital Requirements	814,650	0	0	0	0	0	0	0	0	0	0	0	814,650
20. Water Facilities Capital Requirements	6,251,445	212,493	263,142	291,151	270,372	242,680	261,072	132,246	45,746	21,566	16,388	1,756,856	8,008,301
<b>Financing of Capital Requirements</b>													
<b>Power Facilities Revenue Bond Proceeds</b>													
21. Power Facilities Revenue Bonds through Series H	1,162,458	0	0	0	0	0	0	0	0	0	0	0	1,162,458
<b>Water System Revenue Bond Proceeds</b>													
22. East Branch Enlargement, Current Bonds	473,451	0	0	0	0	0	0	0	0	0	0	0	473,451
23. East Branch Enlargement, Future Bonds	0	9,644	0	0	0	0	0	0	0	0	0	9,644	9,644
24. East Branch Extension, Current Bonds	339,545	0	0	0	0	0	0	0	0	0	0	0	339,545
25. East Branch Extension, Future Bonds	0	6,000	40,453	1,871	0	0	0	0	0	0	0	48,324	48,324
26. South Bay Aqueduct Enlargement, Current Bonds	201,283	0	0	0	0	0	0	0	0	0	0	0	201,283
27. South Bay Aqueduct Enlargement, Future Bonds	0	5,357	4,956	0	0	0	0	0	0	0	0	10,313	10,313
28. Water System Facilities, Current Bonds	1,879,187	0	0	0	0	0	0	0	0	0	0	0	1,879,187
29. Water System Facilities, Future Bonds	0	278,296	257,100	304,000	287,000	253,000	278,000	161,300	42,000	19,000	12,783	1,892,479	1,892,479
30. <i>Subtotal, Water System Revenue Bonds</i>	2,893,467	299,297	302,509	305,871	287,000	253,000	278,000	161,300	42,000	19,000	12,783	1,960,760	4,854,227
<b>Other Capital Financing</b>													
31. Initial Project Facilities Bond Proceeds	1,452,452	0	0	0	0	0	0	0	0	0	0	0	1,452,452
32. Davis-Grunsky Act Program Bond Proceeds	130,000	0	0	0	0	0	0	0	0	0	0	0	130,000
33. Application of CA Water Fund Monies (Tideland Oil Revenues)	508,056	0	0	0	0	0	0	0	0	0	0	0	508,056
34. Interim Financing	248,904	(91,304)	(43,867)	(19,220)	(21,128)	(14,820)	(21,428)	(33,554)	(754)	(1,934)	(895)	(248,904)	0
35. Application of Capital Resources Revenues to Construction	566,269	0	0	0	0	0	0	0	0	0	0	0	566,269
36. Revenue Transfers Applied	104,490	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	149,490
37. <i>Subtotal, Other Capital Financing</i>	3,010,171	(86,804)	(39,367)	(14,720)	(16,628)	(10,320)	(16,928)	(29,054)	3,746	2,566	3,605	(203,904)	2,806,267
<b>38. Total Financing of Capital Requirements</b>	<b>7,066,095</b>	<b>212,493</b>	<b>263,142</b>	<b>291,151</b>	<b>270,372</b>	<b>242,680</b>	<b>261,072</b>	<b>132,246</b>	<b>45,746</b>	<b>21,566</b>	<b>16,388</b>	<b>1,756,856</b>	<b>8,822,952</b>

**Table 14-2 State Water Project Revenues and Expenditures, December 31, 2013 (in thousands of dollars)**

Line Number/Item	Calendar Year												1952-2013
	1952-2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2014-2023	
<b>PROJECT REVENUES</b>													
1. Capital Resources Revenues	814,701	0	0	0	0	0	0	0	0	0	0	0	814,701
<b>Water Contractor Payments</b>													
2. Transportation Capital	4,660,905	153,997	156,160	159,217	156,429	149,029	142,060	134,195	123,668	115,561	112,903	1,403,218	6,064,123
3. Transportation Minimum	4,226,318	256,034	271,551	272,822	266,743	269,411	272,105	274,826	277,574	280,350	283,154	2,724,571	6,950,889
4. Transportation Variable	5,918,043	129,160	303,983	307,407	313,265	331,856	308,897	316,733	319,920	320,016	325,104	2,976,340	8,894,383
5. Off-Aqueduct Power Facilities	3,144,843	43,856	21,333	9,918	9,729	3,915	3,905	4,239	6,193	5,866	4,305	113,259	3,258,101
6. Delta Water Charge	3,181,442	60,297	249,669	249,675	249,675	249,675	249,675	249,675	249,675	249,675	249,675	2,307,369	5,488,812
7. East Branch Enlargement	943,595	41,916	47,576	46,049	47,405	46,451	46,517	45,627	46,006	44,573	38,076	450,196	1,393,791
8. East Branch Extension	156,519	30,088	30,079	34,166	34,119	34,154	34,181	34,220	34,257	34,288	34,314	333,866	490,385
9. Coastal Extension	51,468	4,265	4,623	4,611	4,364	3,363	2,552	3,549	3,674	4,573	3,449	39,023	90,491
10. South Bay Aqueduct Improvements and Enlargement	67,124	18,380	19,942	20,439	19,391	19,404	19,383	19,383	19,389	19,424	19,609	194,744	261,868
11. Tehachapi East Afterbay	33,533	6,376	6,906	6,902	6,390	6,376	6,381	6,376	6,392	6,410	6,501	65,010	98,543
12. Water Revenue Bond Surcharge	686,471	78,241	80,465	81,086	80,139	72,065	75,723	71,347	70,869	68,548	68,298	746,781	1,433,252
13. Subtotal, Water Contractor Payments	21,985,718	822,612	1,192,288	1,192,293	1,187,650	1,185,698	1,161,377	1,160,171	1,157,618	1,149,284	1,145,388	11,354,378	33,340,096
14. Revenue Bond Cover Adjustments	(884,571)	(45,375)	(51,241)	(52,067)	(51,521)	(47,252)	(48,755)	(47,025)	(48,115)	(46,438)	(45,763)	(483,554)	(1,368,125)
15. Rate Management Adjustments	(461,620)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(40,470)	(404,700)	(866,320)
<b>Other Revenues</b>													
16. Federal Payments for Project Operating Costs	389,191	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	21,000	210,000	599,191
17. Appropriations for Operating Costs Allocated to Recreation	28,468	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	128,468
18. Davis-Grunsky Loan Repayments	73,657	1,498	1,285	1,223	1,218	1,027	960	889	882	882	867	10,730	84,387
19. Revenue Bond Proceeds	652,977	0	0	0	0	0	0	0	0	0	0	0	652,977
20. Interest Earnings on Operating Revenues	576,594	520	520	520	520	520	700	700	700	700	700	6,100	582,694
21. Oroville-Thermalito Payments	249,279	0	0	0	0	0	0	0	0	0	0	0	249,279
22. Miscellaneous Revenues	184,264	0	0	0	0	0	0	0	0	0	0	0	184,264
23. Subtotal, Other Revenues	2,122,815	33,018	32,805	32,743	32,738	32,547	32,660	32,589	32,582	32,582	32,567	326,830	2,449,645
<b>24. Total Operating Revenues</b>	<b>22,854,808</b>	<b>769,784</b>	<b>1,133,382</b>	<b>1,132,498</b>	<b>1,128,397</b>	<b>1,130,523</b>	<b>1,104,812</b>	<b>1,105,265</b>	<b>1,101,615</b>	<b>1,094,957</b>	<b>1,091,721</b>	<b>10,792,955</b>	<b>33,647,762</b>
<b>25. Total Operating Revenues and Capital Resources Revenues</b>	<b>23,669,509</b>	<b>769,784</b>	<b>1,133,382</b>	<b>1,132,498</b>	<b>1,128,397</b>	<b>1,130,523</b>	<b>1,104,812</b>	<b>1,105,265</b>	<b>1,101,615</b>	<b>1,094,957</b>	<b>1,091,721</b>	<b>10,792,955</b>	<b>34,462,463</b>
<b>PROJECT EXPENSES</b>													
26. Project Operations, Maintenance, Power, and Replacement Costs	13,424,855	557,326	744,965	772,532	774,569	787,853	748,269	769,093	773,381	782,382	776,853	7,487,223	20,912,078
27. Deposits to Replacement Reserves Under Revenue Bond Financing	86,794	0	0	0	0	0	0	0	0	0	0	0	86,794
28. Deposits to Special Reserves	726,168	(116,297)	66,032	19,674	4,060	3,932	(619)	(41,109)	(50,607)	(66,423)	(41,351)	(222,709)	503,459
29. Capital Resources Expenditures	686,932	0	0	0	0	0	0	0	0	0	0	0	686,932
<b>Payments of Bond Debt Service</b>													
30. Principal Repayments on Bonds Sold Through December 31, 2013 (Current Bonds)	3,152,113	173,549	181,189	182,942	175,854	148,843	151,778	153,747	146,906	149,217	130,951	1,594,976	4,747,089
31. Interest on Bonds Sold Through December 31, 2013 (Current Bonds)	6,127,122	114,129	106,333	99,232	91,507	83,886	77,765	71,166	64,550	58,286	51,812	818,666	6,945,788
32. Future Water Bond Principal Repayments	0	11,215	9,888	19,877	31,193	43,178	55,237	69,846	80,632	86,357	91,225	498,648	498,648
33. Future Water Bond Interest Payments	0	15,363	10,475	23,741	36,714	48,331	57,883	68,021	72,253	70,638	67,732	471,151	471,151
<b>34. Total Principal</b>	<b>3,152,113</b>	<b>184,764</b>	<b>191,077</b>	<b>202,819</b>	<b>207,047</b>	<b>192,021</b>	<b>207,015</b>	<b>223,593</b>	<b>227,538</b>	<b>235,574</b>	<b>222,176</b>	<b>2,093,624</b>	<b>5,245,737</b>
<b>35. Total Interest</b>	<b>6,127,122</b>	<b>129,492</b>	<b>116,808</b>	<b>122,973</b>	<b>128,221</b>	<b>132,217</b>	<b>135,648</b>	<b>139,187</b>	<b>136,803</b>	<b>128,924</b>	<b>119,544</b>	<b>1,289,817</b>	<b>7,416,939</b>
36. Subtotal, Bond Debt Service	8,972,619	314,256	307,885	325,792	335,268	324,238	342,663	362,780	364,341	364,498	341,720	3,383,441	12,356,060
<b>NET REVENUES</b>													
<b>37. Total Operating Expenses and Bond Debt Service</b>	<b>23,258,529</b>	<b>755,284</b>	<b>1,118,882</b>	<b>1,117,998</b>	<b>1,113,897</b>	<b>1,116,023</b>	<b>1,090,312</b>	<b>1,090,765</b>	<b>1,087,115</b>	<b>1,080,457</b>	<b>1,077,221</b>	<b>10,647,955</b>	<b>33,906,484</b>
38. Net System Revenues	410,979	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500	145,000	555,979
<b>Application of Net System Revenues</b>													
39. California Water Fund Repayment	305,765	0	0	0	0	0	0	0	0	0	0	0	305,765
40. Revenues Used for Capital Expenditures	108,990	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	153,990

**Table 14-11 Annual Debt Service on Bonds Sold through December 31, 2013 (in thousands of dollars)**

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds <sup>a</sup>		Pyramid Project Revenue Bonds <sup>b</sup>		Alamo Project Revenue Bonds <sup>b</sup>		Small Hydro Project Revenue Bonds <sup>b</sup>		Water System Facilities Water System Revenue Bonds <sup>c</sup>		Subtotal		Devil Canyon-Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds <sup>d,e</sup>		South Geysers Project Revenue Bonds <sup>b</sup>		Bottle Rock Project Revenue Bonds <sup>b</sup>		East Branch Enlargement Project Water System Revenue Bonds <sup>f</sup>		Coastal Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds <sup>f</sup>		South Bay Enlargement Facilities Water System Revenue Bonds <sup>f</sup>		Tehachapi East Afterbay Facilities Water System Revenue Bonds <sup>f</sup>		Grand Total	
	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
1964	0	3,333	0	0	0	0	0	0	0	0	0	0	0	3,333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,333
1965	0	11,114	0	0	0	0	0	0	0	0	0	0	0	11,114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,114
1966	0	18,764	0	0	0	0	0	0	0	0	0	0	0	18,764	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,764
1967	0	26,911	0	0	0	0	0	0	0	0	0	0	0	26,911	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,911
1968	0	37,761	0	3,876	0	0	0	0	0	0	0	0	0	41,637	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41,637
1969	0	47,460	0	10,448	0	0	0	0	0	0	0	0	0	57,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57,908
1970	0	53,290	0	13,145	0	0	0	0	0	0	0	0	0	66,435	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,435
1971	0	63,035	0	13,145	0	0	0	0	0	0	0	0	0	76,180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76,180
1972	0	69,149	1,260	13,112	0	0	0	0	0	0	0	0	1,260	82,261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,260	82,261	
1973	1,200	69,347	1,330	13,042	0	0	0	0	0	0	0	0	2,530	82,389	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,530	90,097	
1974	3,000	69,533	1,400	12,969	0	0	0	0	0	0	0	0	4,400	82,502	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,400	90,210	
1975	5,000	69,366	1,475	12,893	0	0	0	0	0	0	0	0	6,475	82,259	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,475	89,967	
1976	7,000	69,657	1,555	12,811	0	0	0	0	0	0	0	0	8,555	82,468	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,555	90,176	
1977	10,200	69,298	1,635	12,727	0	0	0	0	0	0	0	0	11,835	82,025	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,835	89,733	
1978	12,700	69,286	5,775	12,537	0	0	0	0	0	0	0	0	18,475	81,823	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,475	89,531	
1979	13,650	68,660	11,585	12,275	0	0	0	0	0	0	0	0	25,235	80,935	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,235	88,643	
1980	16,050	67,941	3,265	11,739	0	7,900	0	0	0	0	0	0	19,315	87,580	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,315	95,288	
1981	18,050	67,078	4,885	11,444	0	7,292	0	0	0	0	0	0	22,935	85,814	0	7,708	0	5,312	0	0	0	0	0	0	0	0	0	0	0	0	22,935	98,834		
1982	19,250	66,130	17,920	10,968	0	7,292	0	0	0	0	0	0	37,170	84,390	0	7,708	0	14,347	0	0	0	0	0	0	0	0	0	0	0	0	0	37,170	106,445	
1983	20,520	65,111	21,110	10,147	0	7,292	0	2,449	0	3,727	0	0	41,630	88,726	900	7,708	0	35,719	0	4,777	0	6,017	0	0	0	0	0	0	0	0	0	42,530	142,947	
1984	21,785	64,036	10,005	9,013	640	7,292	0	4,198	0	3,727	0	0	32,430	88,266	955	7,647	0	35,719	0	5,647	0	10,315	0	0	0	0	0	0	0	0	0	33,385	147,594	
1985	22,555	62,892	12,700	8,628	675	7,238	0	4,198	0	3,727	0	0	35,930	86,683	1,010	7,583	9,425	27,209	0	5,647	0	10,315	0	0	0	0	0	0	0	0	0	46,365	137,437	
1986	23,830	61,705	11,435	7,859	715	7,377	0	4,263	0	3,537	0	0	35,980	84,741	1,070	7,515	3,805	32,882	0	5,516	1,240	10,315	0	4,021	0	0	0	0	0	0	42,095	144,990		
1987	25,495	60,452	11,715	7,188	790	7,513	265	4,329	0	3,348	0	4,952	38,265	87,782	1,135	7,442	4,860	32,605	0	5,386	1,305	10,253	0	9,651	0	0	0	0	0	0	45,565	153,119		
1988	26,770	59,120	6,685	6,664	830	7,447	280	4,314	345	3,348	710	11,037	35,620	91,930	1,205	7,366	5,065	32,295	580	5,521	1,390	10,849	995	9,875	0	0	0	0	0	0	44,855	157,836		
1989	28,145	57,790	33,705	5,513	875	7,378	295	4,298	365	3,328	1,148	14,373	64,533	92,680	1,275	7,284	7,820	27,557	709	5,646	1,565	11,592	1,078	10,104	0	0	0	0	0	0	76,980	154,863		
1990	29,385	56,436	10,385	4,301	930	7,305	320	4,279	405	3,304	1,227	19,555	42,652	95,180	1,355	7,198	6,675	29,781	761	5,596	1,678	11,491	1,134	10,048	0	0	0	0	0	0	54,255	159,294		
1991	30,365	55,034	12,055	3,922	980	7,227	335	4,257	430	3,276	1,219	27,569	46,294	101,285	1,435	7,107	7,170	29,302	818	5,535	1,791	11,376	1,197	16,856	0	0	0	0	0	0	58,705	171,461		
1992	31,745	54,193	14,135	2,985	2,395	5,308	1,260	3,086	960	2,553	5,108	28,412	55,603	96,537	1,520	7,010	8,950	27,188	1,934	4,136	4,575	7,942	2,583	22,241	0	0	0	0	0	0	75,165	165,054		
1993	33,390	52,670	13,755	2,237	1,525	5,688	755	3,300	445	2,640	4,576	29,965	54,446	96,500	1,610	6,907	8,820	26,953	901	4,256	3,264	8,385	3,040	21,428	0	0	0	0	0	0	72,081	164,429		
1994	35,075	51,231	35,225	934	1,580	5,634	780	3,274	695	2,569	5,910	38,223	79,265	101,865	1,705	6,799	77,105	26,273	1,588	4,072	3,374	8,270	4,567	20,752	0	0	0	0	0	0	167,604	168,031		
1995	36,280	49,703	0	0	1,635	5,570	805	3,242	745	2,536	8,064	37,879	47,529	98,930	1,810	6,684	5,420	19,230	1,695	4,004	3,521	8,133	4,979	20,499	0	0	0	0	0	0	64,954	157,480		
1996	37,520	48,024	0	0	2,320	5,486	1,055	3,203	3,135	2,464	10,459	58,171	54,489	117,348	1,920	6,561	49,465	18,130	3,043	3,908	3,682	7,974	4,771	23,240	0	0	0	0	0	0	117,370	177,161		
1997	37,215	46,365	0	0	1,695	5,274	875	3,073	585	2,283	14,375	67,909	54,745	124,904	2,035	6,432	7,515	15,255	1,825	3,696	3,861	7,741	6,300	23,702	0	1,981	0	76	0	0	76,281	183,787		
1998	37,295	44,736	0	0	1,770	5,237	910	3,059	625	2,258	16,755	68,584	57,355	123,874	2,155	6,295	5,045	16,144	1,935	3,637	4,030	7,509	6,760	23,966	0	1,829	0	229	0	0	77,280	183,483		
1999	38,220	43,132	0	0	1,845	5,141	960	3,004	680	2,229	18,701	68,086	60,406	121,592	2,285	6,160	9,310	11,660	2,081	3,549	4,240	7,319	7,518	25,032	0	1,808	65	2,930	0	0	85,905	180,050		
2000	39,510	41,469	0	0	1,925	5,045	1,010	2,955	610	2,197	19,536	66,900	62,591	118,566	2,420	6,040	9,870	11,194	1,950	3,448	4,470	7,097	8,974	24,651	0	1,808	915	2,928	0	0	91,190	175,732		
2001	40,600	39,751	0	0	2,250	4,949	1,155	2,902	780	2,272	20,945	66,417	65,730	116,291	2,565	5,912	10,365	10,758	2,045	3,344	4,720	6,855	9,425	24,188	0	2,131	950	2,889	0	0	95,800	172,368		
2002	41,740	37,984	0	0	2,460	4,619	1,280	2,758	950	2,192	23,918	63,126	70,348	110,679	2,720	5,773	11,185	10,010	2,225	3,074	5,265	6,323	9,817	23,099	335	2,311	1,245	3,481	0	0	103,140	164,750		
2003	43,590	36,159	0	0	2,500	4,429	1,315	2,671	940	2,110	23,441	60,465	71,786	105,834	2,885	5,626	2,135	9,313	2,335	2,889	5,445	5,938	9,988	18,479	245	2,310	1,105	4,278	0	0	95,924	154,667		
2004	45,730	34,244	0	0	2,500	4,291	1,330	2,598	970	2,059	26,396	58,988	76,926	102,180	3,055	5,470	2,210	9,214	2,425	2,758	5,610	5,633	9,883	20,583	220	2,298	2,045	4,747	0	91	0	55	102,374	153,029
2005	46,985	32,242	0	0	2,727	4,097	1,461	2,487	1,327	1,987	23,064	58,061	7																					

**Table 14-11 Annual Debt Service on Bonds Sold through December 31, 2013 (in thousands of dollars)**

(continued)

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds <sup>a</sup>		Pyramid Project Revenue Bonds <sup>b</sup>		Alamo Project Revenue Bonds <sup>b</sup>		Small Hydro Project Revenue Bonds <sup>b</sup>		Water System Facilities Water System Revenue Bonds <sup>c</sup>		Subtotal		Devil Canyon-Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds <sup>b,c</sup>		South Geysers Project Revenue Bonds <sup>b</sup>		Bottle Rock Project Revenue Bonds <sup>b</sup>		East Branch Enlargement Project Water System Revenue Bonds <sup>c</sup>		Coastal Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds <sup>c</sup>		South Bay Enlargement Facilities Water System Revenue Bonds <sup>c</sup>		Tehachapi East Afterbay Facilities Water System Revenue Bonds <sup>c</sup>		Grand Total	
	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
2018	25,435	3,011	0	0	4,870	1,092	2,866	730	2,516	541	64,843	42,343	100,530	47,717	6,910	2,045	104	277	720	215	1,246	549	19,120	9,711	1,680	1,010	8,562	12,497	7,276	7,501	2,715	2,379	148,863	83,901
2019	16,975	1,804	0	0	4,537	890	2,766	616	2,184	430	73,837	39,928	100,299	43,668	7,325	1,682	109	273	762	191	1,266	503	21,610	8,935	1,094	947	8,914	12,140	7,574	7,187	2,845	2,253	151,798	77,779
2020	17,405	956	0	0	5,555	687	3,361	498	2,797	323	69,487	36,936	98,605	39,400	7,765	1,298	113	268	891	165	1,481	455	22,748	8,007	1,927	912	9,333	11,725	7,926	6,835	2,980	2,114	153,769	71,179
2021	8,595	318	0	0	2,648	449	1,692	358	1,153	197	74,436	33,983	88,524	35,305	8,230	890	961	262	929	131	2,255	396	22,720	7,015	2,091	848	9,778	11,285	8,303	6,462	3,138	1,968	146,929	64,562
2022	1,885	60	0	0	5,324	343	5,062	293	1,208	146	71,463	30,893	84,942	31,735	8,725	458	1,008	215	856	95	2,202	299	26,381	5,989	2,872	787	10,230	10,829	8,718	6,075	3,306	1,815	149,240	58,297
2023	85	7	0	0	1,028	96	552	55	638	91	78,805	27,881	81,108	28,130	0	0	558	166	557	59	1,887	196	21,262	4,927	2,073	686	10,711	10,342	9,279	5,663	3,540	1,653	130,975	51,822
2024	35	3	0	0	664	51	381	31	429	61	79,761	24,182	81,270	24,328	0	0	349	138	442	32	1,501	93	21,346	3,969	2,156	602	11,237	9,822	9,728	5,221	3,711	1,484	131,740	45,689
2025	0	0	0	0	149	23	106	16	171	41	75,481	20,340	75,907	20,420	0	0	140	120	62	10	61	9	26,177	2,946	1,729	513	11,771	9,292	10,021	4,749	3,797	1,303	129,665	39,362
2026	0	0	0	0	154	18	110	13	178	34	73,053	16,839	73,495	16,904	0	0	254	113	64	8	63	7	9,875	1,680	1,808	437	15,096	8,738	11,546	4,260	4,609	1,116	116,810	33,263
2027	0	0	0	0	397	13	283	9	264	26	84,029	13,452	84,973	13,500	0	0	328	100	166	6	162	5	9,243	1,222	1,785	356	19,187	7,987	12,682	3,692	5,167	888	133,693	27,756
2028	0	0	0	0	0	0	0	0	140	15	68,167	9,650	68,307	9,665	0	0	443	84	0	0	0	0	9,972	793	2,815	289	25,140	7,031	14,233	3,064	5,972	632	126,882	21,558
2029	0	0	0	0	0	0	0	0	149	8	77,475	6,312	77,624	6,320	0	0	462	61	0	0	0	0	2,935	376	2,976	148	26,226	5,782	14,903	2,361	6,258	336	131,384	15,384
2030	0	0	0	0	0	0	0	0	0	0	7,505	2,497	7,505	2,497	0	0	105	38	0	0	0	0	0	0	0	0	16,600	4,493	6,015	1,630	80	27	30,305	8,685
2031	0	0	0	0	0	0	0	0	0	0	7,870	2,132	7,870	2,132	0	0	110	33	0	0	0	0	0	0	0	17,275	3,817	6,320	1,335	85	23	31,660	7,340	
2032	0	0	0	0	0	0	0	0	0	0	8,255	1,747	8,255	1,747	0	0	120	27	0	0	0	0	0	0	0	17,980	3,114	6,625	1,023	85	19	33,065	5,930	
2033	0	0	0	0	0	0	0	0	0	0	8,670	1,341	8,670	1,341	0	0	125	21	0	0	0	0	0	0	0	18,715	2,381	4,410	695	90	15	32,010	4,453	
2034	0	0	0	0	0	0	0	0	0	0	9,095	916	9,095	916	0	0	130	14	0	0	0	0	0	0	0	19,475	1,619	4,635	475	100	10	33,435	3,034	
2035	0	0	0	0	0	0	0	0	0	0	9,540	469	9,540	469	0	0	140	7	0	0	0	0	0	0	0	20,255	825	4,865	243	105	5	34,905	1,549	
<b>Total</b>	<b>1,582,400</b>	<b>2,386,523</b>	<b>244,995</b>	<b>246,522</b>	<b>107,838</b>	<b>195,867</b>	<b>60,951</b>	<b>101,071</b>	<b>49,141</b>	<b>81,995</b>	<b>1,717,866</b>	<b>1,830,112</b>	<b>3,763,191</b>	<b>4,842,090</b>	<b>139,165</b>	<b>283,872</b>	<b>448,356</b>	<b>570,706</b>	<b>74,515</b>	<b>115,846</b>	<b>156,407</b>	<b>227,974</b>	<b>480,494</b>	<b>611,411</b>	<b>44,064</b>	<b>46,481</b>	<b>333,842</b>	<b>274,490</b>	<b>203,494</b>	<b>141,793</b>	<b>69,391</b>	<b>46,590</b>	<b>5,712,919</b>	<b>7,161,253</b>

<sup>a</sup>Principal and interest schedule adjusted to reflect early redemption of bonds.  
<sup>b</sup>Allocated portions of Power Facilities Revenue Bonds and Water System Revenue Bonds.  
<sup>c</sup>Interest includes a minimum fee for Water System Revenue Bonds Series AB.



## Chapter 15

# SWP Education and Information

*An educational water display at Vista del Lago Visitors Center.*



# MOVING THE WATER TO YOU

## Significant Events in 2013

The last snow survey of the season on May 2 reported that water content in California's snowpack was 16 percent of normal. The State Water Project (SWP) allocated 35 percent of its contractors' requested amounts, a drop from the 65 percent in 2012.

In May, the Department of Water Resources (DWR) began renegotiating the extension and amendment of water supply contracts with the SWP contractors that were signed in the 1960s. The negotiations were done in public and continued throughout the year.

In December 2013, DWR released the *State Water Project Draft Delivery Reliability Report 2013*.

*Information for this chapter was provided by the Public Affairs Office.*

The Department of Water Resources (DWR) Public Affairs Office (PAO) produces and distributes news and program information describing California's water resources, and DWR's mission, programs, and activities. PAO disseminates information by way of news releases, interviews, Internet posts, and both printed and electronic publications. Other avenues include artwork, films, graphics, photography, public meetings, social media, and special events.

## News Topics

Selected highlights below provide examples of PAO's 2013 outreach efforts and news media responses related to DWR's water policy, programs, and activities.

### Snow Surveys

DWR conducts five monthly Sierra snow surveys, ending in late April or early May when snowpack typically is at its peak. By analyzing snow depth and water content, experts gauge the Sierra snowpack's potential for producing snowmelt runoff. Typically, Sierra snowpack produces about one-third of California's annual water supply.

DWR promotes media coverage of its monthly snow surveys to help inform water agency managers and educate the public about snowpack conditions and water supply prospects. In 2013, the monthly surveys were closely covered due to the possibility that water year 2014 could be a third consecutive dry year following water year 2012, which was the 25th driest year in terms of statewide runoff in records going back 112 years.

On May 2, the fifth and final DWR snow survey found that the statewide snowpack water content was 17 percent of average. One year earlier, statewide snowpack water content was 40 percent of average.

### Airborne Snow Observatory Program

During April, following the driest January–March period on record for portions of California, DWR conducted aerial surveys of the snowpack. The Airborne Snow Observatory Program is a 3-year pilot project and partnership between DWR and the National Aeronautics and Space Administration's Jet Propulsion Laboratory. The aerial surveys began with the Tuolumne River Basin and were conducted with a plane equipped with Light Detection and Ranging (LIDAR) technology to measure the snowpack's depth and conduct spectrometer readings to gauge the snow's reflectivity. This information, when combined with data from the traditional manual snow surveys and electronic sensors, provides a better estimate of California's water supply.

### State Water Project Allocations

DWR set the State Water Project (SWP) final allocation figure at 35 percent of SWP water contractors' requests for deliveries. In 2012, the final allocation was 65 percent.

In 2011, SWP final allocation was 80 percent, up from an initial allocation of 25 percent. The final allocation was 50 percent in 2010, 40 percent in 2009, 35 percent in 2008, and 60 percent in 2007. The most recent 100 percent allocation occurred in 2006. Meeting 100 percent allocation is not easy to achieve, even in wet years, due to Delta pumping restrictions to protect threatened and endangered fish.

## Contract Extension Program

On May 1, 2013, DWR met with SWP contractors and the public to begin negotiating the extension of the water supply contracts. To ensure continued affordability of debt service to SWP contractors, it is necessary to extend the termination date. The extension will allow DWR to continue to sell bonds with 30-year terms, ensuring the debt service on these bonds remains affordable to SWP contractors and their water customers.

Announcements and information about the negotiation sessions are available on the Water Supply Contract Program webpage on DWR's website

## Bay Delta Conservation Plan

In August 2013, DWR announced changes to the proposed Bay Delta Conservation Plan (BDCP) water conveyance system in the Sacramento-San Joaquin Delta that would shrink the total permanent footprint of the project by 50 percent, shift more than 400 acres of permanent and temporary construction from private to public lands.

The BDCP is a 7-year effort by federal and State agencies and other stakeholders to stabilize water deliveries from the Delta while enhancing the Delta's ecosystem.

## Flood Preparedness

In early November, during California Flood Preparedness Week, California was inducted into the national Silver Jackets program at a letter-signing ceremony in Sacramento. Silver Jackets teams are State-led interagency groups that work together to focus on State priorities to reduce flood risk through increased flood risk communication and improved emergency response processes. Through the Silver Jackets program, federal, State, and local agencies can coordinate activities that increase public awareness of flood risk. DWR is the lead State agency for the Silver Jackets program in California.

PAO publicized the April 3 Public Review Draft release of *California's Flood Future: Recommendations for Managing the State's Flood Risk*, the comprehensive State/federal report that suggests recommended future actions to improve flood management statewide. This report was developed by DWR and the U.S. Army Corps of Engineers to provide a look at statewide exposure to flood risk and to identify and address the barriers to improved flood management. The final version of this report was released in November 2013, during California Flood Preparedness Week.

During the same week in November, PAO publicized DWR-directed flood fight training on November 5, to teach emergency response procedures utilized during a flood event.

## Drought Management Team

During December 2013, in anticipation of a drought proclamation and in an effort to prepare for and reduce potential impacts of what was expected to be a dry 2014, DWR announced a new drought management team.

To address the drought, DWR began streamlining and improving its processes and guidance for water transfers, as transfers were identified as a key drought response tool. Additionally, drought preparedness workshops were held to inform agricultural users of statewide water conditions and available drought preparedness measures.

## SWP Delivery Reliability Report

In December 2013, DWR released *The State Water Project Draft Delivery Reliability Report 2013* for public review. It updated the estimated water delivery capability of the SWP for current 2013 conditions and for projected conditions in 2033. The estimates include the potential effects of climate change and the anticipated changes in Sacramento River Basin land uses. The public comment period ends January 17, 2014.



## SWP Publications

DWR maintains approximately 40 brochures describing the SWP, its mission, and its facilities. The brochures are periodically updated and distributed statewide to educate the public about the SWP.

Brochures issued during 2013 included updates on the *Upper Feather River Lakes* and *San Luis Joint-Use Complex*. Spanish translations were completed for a water safety video, a salmon life-cycle game, and the *Save Our Water* website.

## E-News

Each weekday, PAO compiles and electronically distributes news articles and commentaries on water-related issues to more than 5,000 subscribers. These news clips inform DWR staff of water issues relevant to DWR and its programs.

## Spotlight Stories and Social Media

On DWR's main website and on DWR's Facebook page, 53 Spotlight Stories were featured about DWR's projects and programs. Subjects included drought preparedness, snow surveys, fish passage improvement projects, California Aqueduct repair and the release of the BDCP's final chapters. DWR uses Facebook two or three times each week to send messages to followers on numerous drought- and water-related subjects. DWR's Twitter account averages three postings a week with various items of interest to the public and DWR personnel.

## DWR Magazine

Published three times a year, this news magazine features articles describing DWR programs, staff, and activities. It has evolved in recent years from separate publications. Increasingly oriented toward an electronic readership, it is a source for news of interest to DWR employees.

In 2013, features covered the Bryte Chemical Laboratory, East Branch Extension, Georgiana Slough non-physical barrier, Knaggs Ranch project, atmospheric river observatories, Dutch Slough Tidal Marsh Restoration project, water transfers, and the SWP contract extension negotiations.

## DWR Tours Program

The DWR tours program regularly attracts foreign and domestic tour groups. The SWP and its water supply mission is the major attraction. During 2013, a full schedule of foreign, domestic, and school tour groups received briefings and escorted trips to selected SWP facilities. As a basic component of DWR's Training Program, tours were provided for recently hired DWR employees to the Sacramento–San Joaquin Delta and to Oroville Dam and Lake Oroville.

During 2013, DWR welcomed a number of foreign visitors to DWR's Headquarters and SWP facilities. Tour groups came from 21 foreign countries, including Japan, China, Australia, United Kingdom, Ireland, Korea, Taiwan, Canada, Denmark, France, Turkey, Germany, India, Indonesia, Italy, Morocco, Palestine, Philippines, South Korea, Spain, and Vietnam.

There were also a number of domestic tour groups from throughout the United States, and several school tours.

Tour highlights included:

- Oroville Field Division hosted 170 groups (6 foreign) with 4,999 participants;
- Delta Field Division hosted 18 groups with 1,390 participants;
- Romero Overlook Visitors Center hosted 70 tour groups (28 foreign) with 2,365 participants;
- San Joaquin Field Division hosted four contractor groups;

- Southern Region Office hosted 10 tour groups (all foreign) with 82 participants; and
- Vista del Lago Visitors Center welcomed 20 tour groups totaling 731 participants.

Figure 15-1 shows the SWP visitors center locations.

## Community Relations and Recreational Safety

In 2013, PAO staff continued to educate the public about water conservation and the Save Our Water program through DWR's award-winning water-efficient gardens at The Farm at the California State Fair.

PAO staff also provided exhibits at the following events:

- San Francisco Flower & Garden Show;
- Children's Water Education Festival, University of California, Irvine;
- Sacramento Zoo's Earth Fest-It's a Party for the Planet!;
- Cal/EPA Earth Day, Sacramento;
- Earth Day at Sacramento City College;
- Earth Day at Sierra College, Rocklin;
- Sacramento Earth Day, Sacramento Municipal Utility District;
- Festival de Ciencias (Science Festival) César Chávez Elementary School, Davis;
- Native American Day, California State Capitol, Sacramento; and
- Grape, Raisin, & Nut Expo, Fresno.

In 2013, DWR worked with Radio Disney for the fifth year to educate younger Californians about water conservation and water safety via public service announcements, online at Radio Disney websites, and at Northern and Southern California regional events.

DWR also co-sponsors and coordinates "Catch A Special Thrill" (C.A.S.T.) fishing events for children with special needs.

During 2013, C.A.S.T. events were held at SWP reservoirs and in the Sacramento-San Joaquin Delta.

DWR continued its partnerships with communities to offer nine Aquatic Adventure Camps throughout the summer months, teaching water safety to children. In 2013, the camps utilized facilities at Lake del Valle, Castaic Lake, and Lake Perris. DWR staff also produced an Albert and Einstein Water Safety Video to complement the youth safety program.

In October 2013, DWR hosted a Take a Warrior Fishing event at Lake del Valle, for 30 participants. This program supports military personnel and their families. The focus was to create an adaptive, community-based outdoor recreation experience through the sport of fishing.

## SWP Recreation Outreach Program

The goal of the SWP recreation outreach program is to educate the public about the many recreational opportunities available at SWP facilities. PAO staff attends community events; State and county fairs; State and federally sponsored events; and forms partnerships with State, federal, and community groups.

### SWP Recreation Outreach Events

DWR, the California Department of Parks and Recreation, and several partner agencies co-sponsored or attended the following recreation outreach events in 2013:

- 25th Annual Manufacturers RV Show, Pleasanton;
- International Sportsmen's Exposition, Sacramento;
- Healdsburg Wild Steelhead Festival;
- Sacramento Boat Show and Off-Road Exposition;
- Jack Splash Club/Oroville YMCA Fit-N-Fun Day, Oroville;
- North State Sportsman Expo, Chico;
- Stockton Asparagus Festival;



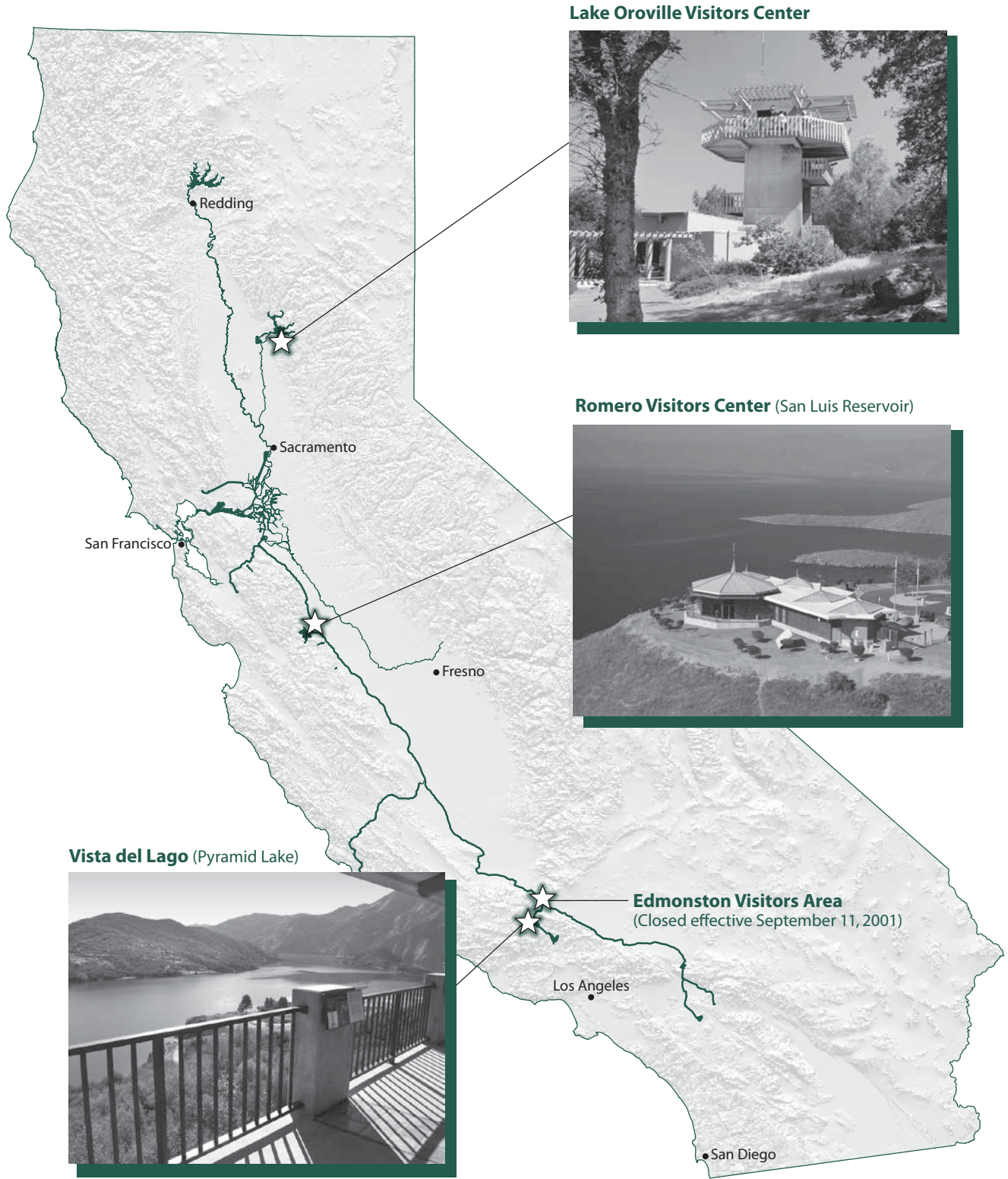


Figure 15-1 Visitors Centers on the SWP

- Elk Grove Western Festival;
- Feather Fiesta Days, Oroville;
- Dixon May Fair;
- Hooked on Fishing, Not on Drugs, Oroville
- C.A.S.T., Lake Oroville, Oroville;
- C.A.S.T., Lake del Valle, Livermore;
- C.A.S.T., O'Neill Forebay, Gustine;
- Butte County Fair Sportsman's Expo, Gridley;
- Pittsburg Seafood and Music Festival;
- Feather River Oroville Salmon Festival; and
- Stanislaus River Salmon Festival, Knight's Ferry.

The Jack Splash Club was created by PAO as a way to interest and educate kids and their families in the Oroville area about safe water recreation. The Oroville YMCA helps manage the club because of its water safety programs, fitness programs, and community standing.

### **SWP Recreation Outreach Publications**

The following recreation outreach publications were made available to the public in 2013:

- *Family Getaway Map*
- *Family Getaway Guide*
- *Lake Oroville Recreation*
- *Camp on Water!*
- *Upper Feather River Lakes*
- *South Bay Aqueduct/Lake del Valle/ Bethany Reservoir*
- *San Luis Joint-Use Complex*
- *Quail Lake*
- *Pyramid Lake*
- *Castaic Lake*
- *Lake Perris*
- *Silverwood Lake*
- *Fishing Along the State Water Project*
- *State Water Project Recreation Facilities*
- *Water Safety Along the SWP*
- *Quagga Warning Card*
- *Quagga Information Sheet*
- *Bay Delta conservation materials*

The *Family Getaway Map* and *Family Getaway Guide* were developed to expand public awareness of California's rivers, lakes, and reservoirs.

## **School Education Program**

The School Education Program's goal is to provide students and educators with a statewide perspective on water issues such as conservation, conveyance systems, and the water cycle. PAO staff develops and promotes high-quality materials, providing them free of charge to schools, educators, and water districts. Program achievements for 2013 are described below.

## **Public Events and Outreach**

PAO staff provided displays of DWR's interactive children's exhibits and other educational materials at:

- the Capitol Area Science Education Leaders Conference, Stockton;
- the Sacramento Municipal Utility District's Youth Energy Summit, Sacramento;
- the California Academy of Sciences' Family Science Night, San Francisco;
- AgVenture, San Joaquin County;
- Farm Day in the City, Bakersfield;
- the Sacramento Area Creeks Council's Creek Week Event, Sacramento;
- Water Planet Adventure Day, Fresno;
- the CalEPA Earth Day event, Sacramento;
- El Dorado County Farm Day, Placerville;
- State Scientists' Day, Sacramento;
- the Sacramento Municipal Utility District's Solar Regatta, Herald;
- Sacramento County Fair, School Tour Days, Sacramento;
- Amador County Farm Day, Plymouth; and
- the California Science Teachers Association Conference, San Jose.

PAO staff organized a team of DWR judges from multiple divisions and provided a special award at the Sacramento Regional Science and Engineering Fair in Sacramento.

PAO staff assisted at the BDCP's booth at the League of Women Voters Bay Area League Day and at both of the Save Our Water booths at the Sacramento City College Earth Day event and the California Green Fair in Sacramento.

## Publications and Materials

Curriculum materials and children's videos were provided to California teachers and water agencies through the *Water Facts & Fun* online catalog and order form and during promotional events. During 2013, the following materials were purchased or reprinted:

- 7,000 *California's Amazing Delta* book covers;
- 8,000 *California Water Works & Why It Does* student booklets;
- 3,500 *Captain Hydro* student booklets, English version;
- 3,000 hamburger activity sheets for students;
- 2,000 *KIDS: Conserve Water* student activity booklets (new offering);
- 3,000 *KIDS: Discover Floods* student activity booklets (new offering);
- 2,500 *KIDS: Discover Storm Water* student activity booklets;
- 3,000 *KIDS: Watershed Protection* student activity booklets;
- 9,000 *Parent/Student Water Conservation Checklists*;
- 4,000 *Sacramento/San Joaquin Delta Facts*;
- 4,000 *Water & Me* student activity booklets;
- 11,000 *Water Fun* student booklets; and
- 400 *Project WET* (Water Education for Teachers) books, which were provided to preservice teachers who participated in Project WET training workshops.

## Collaboration and Partnerships

DWR's School Education Program seeks to partner with other entities with similar interests and goals to pool resources in educating California's youth on the importance of water resources. During 2013, PAO staff participated in the following collaborative activities/meetings:

- DWR's Water Education Committee meeting;
- Project WET Advisory Committee, the California Environmental Education Interagency Network Committee;
- California Urban Water Conservation Council's education subcommittee and the Northern California Water Educators Collaborative;
- Creek Week Planning Committee and the Kids' Art Contest Winner Selection Subcommittee;
- Caring for Our Watersheds contest, sponsored by Agrium Inc. and the Center for Land-Based Learning; and
- Sacramento Municipal Utility District's Youth Energy Summit Student Showcase.

Additional collaborative efforts included PAO staff working with the following:

- California Department of Education's California Regional Environmental Education Community network;
- California Project WET program;
- Floodplain and Delta Ecology Institute for teachers, co-sponsored with the San Joaquin County Office of Education;
- Floodplain and Riparian Ecology Institute for teachers, co-sponsored with California State University, Chico; and
- Delta Studies Institute for teachers, co-sponsored with the San Joaquin County Office of Education.





# Glossary

This glossary contains terms used in the text of Bulletin 132-14 as well as additional terms related to water resources.

## A

**abundance** The number of organisms of a particular kind in a population. (See also, abundance index.)

**abundance index** (fisheries) A relative measure of the weight or number of fish in a stock, a segment of the stock (e.g. the spawners), or an area. Often available in time series, the information is collected through scientific surveys or inferred from fishery data.

**acre-foot** The volume of water that would cover one acre to a depth of one foot; equal to 43,560 cubic feet or 325,851 gallons.

**adaptive management** The process of improving management effectiveness by learning from the results of carefully designed decisions or experiments.

**adipose fin** A small fleshy fin with no rays on the topside of a fish located between the fin on the back and the tail fin.

**afterbay** A storage reservoir downstream of a power plant or large reservoir that regulates fluctuating discharges from a spillway, hydroelectric power plant, or a pumping plant.

**agricultural drainage** (1) The process of directing excess water away from root zones by natural or artificial means, such as by using a system of drains placed below ground surface level (also called subsurface drainage); (2) the water drained away from irrigated farmland.

**alluvium** Unconsolidated soil strata deposited over time by flowing water.

**amphipod** A small crustacean with a flat (laterally compressed) body belonging to the group Amphipoda, found in both marine and freshwater environments.

**anadromous** Fish that live the majority of their life cycle in the sea and return to freshwater streams to spawn.

**anion** An atom or a molecule in which the total number of electrons is greater than the total number of protons, giving it a net negative electrical charge.



**aquifer** A geologic formation that stores water underground (called groundwater), especially one that yields significant quantities of water to wells or springs.

**arid** Describes a climate or region in which precipitation is so deficient in quantity or occurs so infrequently that intensive agricultural production is not possible without irrigation.

**artificial recharge** The addition of surface water to a groundwater basin by human activity, such as putting surface water into spreading basins.

**atmospheric river** A short-lived, narrow stream of high-velocity wind that carries large amounts of water vapor from tropical oceans to mid-latitude land areas resulting in large amounts of precipitation in those areas.

**average annual runoff** The average value of annual runoff volume calculated for a selected period of record, at a specified location, such as a dam or stream gauge.

**average year water demand** Demand for water under average hydrologic conditions for a defined level of development.

## B

**balanced water conditions** These exist when upstream reservoir storage releases, plus other inflows, approximately equal the water supply needed to (1) satisfy Sacramento Valley and Sacramento-San Joaquin Delta in-basin needs, including Delta water quality requirements, and (2) meet export needs. DWR and the Bureau of Reclamation jointly decide when balanced or excess water conditions exist.

**beneficial use** Water quality beneficial use categories for water are designated by State law. Beneficial uses of the waters of the State that may be protected against water quality degradation include, but are not limited to, domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

**benthic organisms** Aquatic animals without backbones that dwell on or in the bottom sediments of fresh or salt water.

**biological assessment** A document prepared as part of the Endangered Species Act, Section 7 process to determine whether a proposed major construction activity under the authority of a federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat.

**biological opinion** A document required by the Endangered Species Act stating the opinion of the U.S. Fish and Wildlife Service or National Marine Fisheries Service on whether or not a federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

**biota** Living organisms of a region, as in a stream or other body of water.

**brackish water** Water containing dissolved minerals in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses. Considerably less saline than seawater.

**bromide** A salt which naturally occurs in small quantities in seawater; a compound of bromine.

**Burns-Porter Act** (California Water Code Section 12930 et seq.) Formally known as the California Water Resources Development Bond Act, this act passed the Legislature in 1959 and was approved by voters in 1960. It provided initial funding of \$1.75 billion in general obligation bonds and authorized construction of the State Water Project facilities.

**bypass** As part of a flood management system, a natural overflow area or channel that allows excessive floodwaters to flow or be diverted from a main river channel to prevent water from overflowing the main river channel.

## C

**CALFED Bay-Delta Program** (CALFED) A federal and State multiagency program established by the 1994 Bay-Delta Accord. CALFED's mission was to develop and implement a long-term comprehensive plan that would restore ecological health and improve water management in the Bay-Delta system. In 2010, all functions and responsibilities of CALFED were assumed by the Delta Stewardship Council.

**California Data Exchange Center** (CDEC) CDEC installs, maintains, and operates an extensive hydrologic data collection network including automatic snow reporting gauges for the DWR Cooperative Snow Surveys Program and precipitation and river stage sensors for flood forecasting. CDEC provides a centralized location to store and process real-time hydrologic information gathered cooperatively throughout the State.

**California Irrigation Management Information System** (CIMIS) A network of automated weather stations that are owned and operated cooperatively between DWR and local agencies. The stations are installed in most of the agricultural and urban areas of the State and provide farm and large landscape irrigation managers and researchers with "real-time" weather

data to estimate crop and landscape evapotranspiration rates and make irrigation management decisions.

**California Water Resources Simulation Model (CALSIM)** A computer model that simulates operations of SWP and Central Valley Project water delivery systems. CALSIM II is a planning tool that was jointly developed by DWR and the Bureau of Reclamation. The model's inputs include hydrologic data for specified study planning years, water demands, infrastructure and regulatory change, and other factors. Outputs include deliveries to water contractors, river flows, reservoir changes, Delta hydrologic parameters, and other data.

**cation** An atom or a molecule in which the total number of protons is greater than the total number of electrons, giving it a net positive electrical charge.

**Central Valley Project deliveries** The volume of water imported to a given area through the Central Valley Project.

**ciliates** Single-celled organisms, characterized by the presence of many hair-like structures called cilia used for locomotion and for feeding.

**climate change** Any significant change in the measures of climate lasting for an extended period of time. This includes major changes in temperature, precipitation, or wind patterns, among other things, that occur over several decades or longer.

**coded wire tag** A small piece of stainless steel wire injected into the snout of juvenile salmon and steelhead. Each tag is etched with a binary code that identifies a fish release group.

**conjunctive use** Application of surface water and groundwater to meet the demand for a beneficial use. Coordinated and planned management of both surface water and groundwater resources to maximize the efficient use of the resources; that is, the planned and managed operation of a groundwater basin and a surface water storage system combined through a coordinated conveyance infrastructure. Water is stored in the groundwater basin for later planned use by intentionally recharging the basin during years of above-average surface water supply.

**conservation facilities** Reservoir facilities that store water and make it available for later use.

**consultation** The process required of a federal agency under Section 7 of the Endangered Species Act when any activity authorized, carried out, or conducted by that agency may affect a listed species or designated critical habitat; consultation is with the U.S. Fish and Wildlife Service or National Marine Fisheries Service and may be either informal or formal.

**conveyance** Provides for the movement of water and includes the use of natural watercourses and constructed facilities including open channels, pipelines, diversions, fish screens, distribution systems, and pump lifts.

**conveyance facilities** Canals, pipelines, pump lifts, ditches, etc., used to move water from one area to another.

**cryptomonad** A single-celled, photosynthetic organism with two flagella that inhabits both marine and freshwater environments.

**cyanobacteria** Photosynthetic, nitrogen-fixing, colonial bacteria found in a wide variety of terrestrial and aquatic habitats, often referred to as “blue-green algae.”

## D

**Davis-Grunsky Act** Authorized in 1960 as part of the Burns-Porter Act, this act provides construction loans for local domestic water projects and agricultural water conservation projects.

**Delta outflow** Freshwater outflow from the Sacramento-San Joaquin Delta to protect the beneficial uses within the Delta from the incursion of saline water.

**Delta outflow index** A calculated approximation of the seaward freshwater outflow as it passes Chipps Island near Pittsburg, beyond the confluence of the Sacramento and San Joaquin rivers.

**desalting** A process to reduce the salt concentration of seawater or brackish water.

**diatom** Microscopic marine or freshwater colonial algae that have cell walls made out of silica.

**dinoflagellate** A small, single-celled organism with flagella and an internal skeleton of cellulose-like plates found in both marine and freshwater environments and best known as causers of harmful algal blooms.

**discount rate** The interest rate used to calculate the present value of future benefits and future costs or to convert benefits and costs to a common time basis.

**dissolved organic compounds** Carbon-based substances dissolved in water.

**dissolved oxygen** The amount of oxygen dissolved in water or wastewater, usually expressed in milligrams per liter, parts per million, or percent of saturation.

**distinct population segment** A subdivision of a species that is treated as a species for purposes of listing under the Endangered Species Act. The smallest division of a taxonomic species that can be protected under the Endangered Species Act.

**drainage area** The area of land from which water drains into a river; for example, the Sacramento River Basin, in which all land area drains into the Sacramento River. Also called a watershed, drainage basin, or river basin.

**drought preparedness** The magnitude and probability of economic, social, or environmental consequences that would occur as a result of a sustained drought under a given study plan.

**drought condition** Hydrologic conditions during a defined period, greater than one dry year, when precipitation and runoff are much less than average.

**drought year supply** The average annual supply of a water development system during a defined drought period.

**Delta Simulation Model 2 (DSM2)** A hydrodynamic and water quality simulation model used to simulate water flow and quality conditions in the Sacramento-San Joaquin Delta. The model is frequently used to evaluate potential changes in Delta conditions (salinity, flow, and water level) associated with changes in flow patterns in the Delta.

## E

**ecosystem restoration** The activity of improving the condition of natural landscapes and biotic communities.

**effluent** Wastewater or other liquid, treated or in its natural state, flowing from a treatment plant or process.

**electrical conductivity** The measure of the ability of water to conduct an electrical current, the magnitude of which depends on the dissolved mineral content of the water.

**endangered species** An animal or plant species in danger of extinction throughout all or a significant portion of its range.

**entrainment** The unintended diversion of fish (or other aquatic organisms) into an unsafe passage route. The incidental trapping of any life stage of fish within waterways or structures that carry water being diverted for use



elsewhere. Fish are considered “entrained” when they enter a diversion point, which for the SWP is Clifton Court Forebay.

**environmental impact report** A report done to analyze project or program impacts on a variety of resources under the California Environmental Quality Act.

**environmental impact statement** A report done to analyze project or program impacts on a variety of resources under the National Environmental Policy Act.

**environmental water** The water for wetlands, for the instream flow in a major river or the Bay-Delta, or for a designated wild and scenic river.

**escapement** The portion of an anadromous fish population that escapes commercial and recreational fisheries and reaches its freshwater spawning grounds.

**estuary** A semi-closed coastal body of water where the lower course of a river enters the sea, influenced by tidal action where the tide meets the river flow, resulting in brackish water.

**evapotranspiration** The amount of water transpired by plants, retained in plant tissues, and evaporated from plant tissues and surrounding soil surfaces. (See also, reference evapotranspiration.)

**excess water conditions** Periods when it is agreed that releases from upstream reservoirs plus unregulated flow exceeds Sacramento Valley in-basin uses plus exports. DWR and the Bureau of Reclamation jointly decide when balanced or excess water conditions exist. During excess water conditions, sufficient water is available to meet all beneficial needs, and the SWP and Central Valley Project are not required to supplement the supply with water from reservoir storage.

**export** An amount of water transported from one source or location to another.

## F

**firm yield** The maximum annual supply of a water development project under drought conditions, for some specified level of demand.

**flagellates** Organisms with one or more whip-like structures called flagella, which are used for locomotion or feeding.

**floodplain** A strip of relatively level land bordering a stream or river that is often inundated during times of high water.

**forages** Food for animals, especially crops grown to feed horses, cattle, and other livestock.

**forebay** A reservoir at the intake of a pumping plant or power plant to stabilize water levels; also a storage basin for regulating water for percolation into groundwater basins.

**fork length** A measurement used frequently for fish length when the tail has a fork shape; projected straight distance between the tip of the snout and the fork of the tail.

**freeboard** The height of the physical top of a levee above a specified water surface elevation. This serves as a factor of safety for containing water in the stream or reservoir without overtopping the levee or dam.

**fry** Young, recently hatched fish that are able to swim and catch their own food.

## G

**greenhouse gas emissions** Also referred to as carbon intensity or carbon footprint, greenhouse gases trap heat in the atmosphere and contribute to climate change. They include carbon dioxide, methane, nitrous oxide, and fluorinated gases.

**grilse** A term that generally refers to young adult salmonids of a certain length and age. Grilse are often 55–65 centimeters (22–26 inches) in length. They are assumed to be two years old, and adults are assumed to be age three and older.

**groundwater** Water located beneath the land surface that fills the pore spaces of the alluvium, soil, or rock formation in which it is situated. It excludes soil moisture, which refers to water held by capillary action in the upper unsaturated zones of soil or rock.

**groundwater bank** Groundwater banking refers to the practice of recharging specific amounts of water in a groundwater basin during wet or above-average years, which can later be withdrawn and used by the depositing entity.

**groundwater basin** An alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and having a definable bottom.

**groundwater recharge** The natural or intentional infiltration of surface water into the zone of saturation of an aquifer (i.e., into groundwater).

**groundwater storage capacity** The volume of void space that can be occupied by water in a given volume of a formation, aquifer, or groundwater basin.

**groundwater table** The upper surface of the zone of saturation in an unconfined aquifer.

## H

**habitat** The place or environment where a plant or animal naturally lives and grows with a group of particular environmental conditions.

**habitat conservation plan** A plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species; it usually includes measures to minimize impacts, and may include provisions for permanently protecting land, restoring habitat, and relocating plants or animals to another area. Required before a federal Endangered Species Act incidental take permit may be issued.

**halophyte** A plant capable of growing in salty soil.

**haptophyte** A kind of unicellular marine phytoplankton typically covered in tiny scales or plates composed of carbohydrates and calcium deposits.

**hydraulic barrier** (1) A barrier created by injecting fresh water to control seawater intrusion in an aquifer, or created by water injection to control migration of contaminants in an aquifer. (2) A barrier developed in the estuary (the Delta) by release of fresh water from upstream reservoirs to prevent intrusion of seawater into the body of fresh water.

**hydrologic balance** An accounting of all water inflow to, water outflow from, and changes in water storage within a hydrologic unit over a specified period of time.

**hydrologic basin** Where, conceptually, any drop of water that falls in the basin will flow to a stream or groundwater basin within it. It is a larger set of which a subset is the groundwater basin that can be within a hydrologic basin. DWR's hydrologic regions are collections of the larger hydrologic basins.

**hydrologic region** DWR divides California into 10 hydrologic regions, corresponding to the state's major water drainage basins: North Coast, San Francisco Bay, Central Coast, South Coast, Sacramento River, San Joaquin River, Tulare Lake, North Lahontan, South Lahontan, and Colorado River.

**hydrology** The science dealing with the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere.

## I

**in-lieu recharge** The practice of providing surplus surface water to historic groundwater users, thereby leaving groundwater in storage for later use.

**ion exchange** Processes of purification, separation, and decontamination of aqueous and other ion-containing solutions with solid ion exchangers (such as sodium carbonate used for water softening).

**instream use** Use of water within its natural watercourse as specified in an agreement, water rights permit, etc. For example, the use of water for navigation, recreation, fish and wildlife, aesthetics, and scenic enjoyment.

**integrated regional water management** A comprehensive approach for determining the appropriate mix of demand and supply management options to provide long-term, reliable water supply at the lowest reasonable cost and with the highest possible benefits to customers, economic development, environmental quality, and other social objectives.

**invertebrate** An animal that lacks a backbone.

## J

**joint points of diversion** The ability of the SWP to use Jones Pumping Plant as a point of diversion and the Central Valley Project to use Banks Pumping Plant as a point of diversion. The SWP and Central Valley Project may use one another's diversion facilities under certain conditions.

**joint powers agreement** An agreement entered into by two or more public agencies that allows them to jointly exercise any power common to the contracting parties. This is defined in Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the California Government Code.

**joint-use facilities** Those portions of the SWP that serve both SWP and Central Valley Project functions, and in which both State and federal agencies participate in the construction and use; specifically, the San Luis complex and Reaches 3, 4, 5, 6, and 7 of the California Aqueduct.

**jurisdictional dam** Artificial barriers, together with appurtenant works, which are 25 feet or more in height or have an impounding capacity of 50 acre-feet or more, which are regulated by the DWR Division of Safety of Dams.

## K

**kathablepharid** A specific type of cryptomonad.

**L**

**land subsidence** The lowering of the natural land surface in response to: earth movements; the lowering of fluid pressure or groundwater level; consolidation of underlying soils; removal of underlying supporting materials by mining (e.g., oil and gas extraction); compaction caused by wetting; or oxidation of organic matter in soils (e.g., peat soil being converted to gas).

**legal Delta** The legal geographical boundaries of the Sacramento-San Joaquin Delta, as established by the Delta Protection Act of 1959, and as defined in California Water Code Section 12220.

**listed species** A species, subspecies, or distinct population segment that has been added to the federal list of endangered and threatened wildlife and plants. The term also applies to a species or subspecies added to the California list of endangered or threatened plants and animals.

**M**

**maximum contaminant level** The highest drinking water contaminant concentration allowed under federal and State Safe Drinking Water Act regulations.

**mitigation** (1) An action or set of actions designed to avoid, minimize, reduce, eliminate, or compensate for adverse environmental impacts due to an agency activity or program. (2) Reduction of human activities that affect global climate change, including strategies to reduce greenhouse gas emissions.

**Monterey Agreement** An agreement executed in December 1994 among DWR and the SWP water contractors to address fundamental contract issues by amending the long-term water supply contracts.

**Monterey Amendments** Amendments to the long-term water supply contracts for the SWP entered into by DWR and most (27 of 29) of the SWP water contractors in 1995 and 1996 as implementation of the terms of the Monterey Agreement.

**multipurpose project** A project, usually a reservoir, designed to serve more than one purpose, whose costs are normally allocated among the different functions it provides. For example, a project that provides water supply, flood control, and generates hydroelectricity.



**N**

**natural community conservation planning (NCCP)** A process that promotes multispecies and multihabitat management and conservation through cooperative efforts among public agencies, private landowners, and other interests within a plan area. It provides a framework for minimizing impacts on plant communities and wildlife from proposed development projects.

**natural recharge** Natural replenishment of an aquifer generally from snowmelt and runoff through seepage from the surface.

**net groundwater** The amount of groundwater extraction in excess of deep percolation.

**nonreimbursable costs** The part of project costs allocated to general statewide or national beneficial purposes and funded from general revenues, rather than by water users.

**normalized demand** The process of adjusting actual water use in a given year to account for unusual events such as dry weather conditions, government price support programs for agriculture, rationing programs, or other unusual conditions.

**O**

**operational yield** An optimal amount of groundwater that should be withdrawn from an aquifer system or a groundwater basin each year. It is a dynamic quantity that must be determined from a set of alternative groundwater management decisions subject to goals, objectives, and constraints of the management plan.

**Operations Criteria and Plan (OCAP)** (1) The document titled, "Long-Term Central Valley Project Operations Criteria and Plan," that serves as a baseline description of the facilities and operating environment of the Central Valley Project and the SWP and identifies factors influencing the physical and institutional conditions and decision-making processes under which the projects currently operate. Regulatory and legal requirements are explained and alternative operating models and strategies described. (2) The document titled, "Central Valley Project Operations Criteria and Plan" (CVP-OCAP, 2004), that describes the laws, regulations, and other criteria applicable to operations of the Central Valley Project that were in effect from 1991 through 2003.

**Operations Criteria and Plan biological opinion** (1) The document titled, "Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and the State Water Project" (NOAA Fisheries, 2009).

(2) The December 15, 2008, memorandum from the U.S. Fish and Wildlife Service to the Bureau of Reclamation that comprises the U.S. Fish and Wildlife Service biological opinion on the coordinated operations of the Central Valley Project and the SWP.

**ostracod** A type of bivalve (with a hinged, two-part shell) crustacean, mostly microscopic to small in size, found in aquatic and marine habitats occurring as benthic or planktonic organisms.

**otolith** Ear bone of a fish. Otoliths often show seasonal or annual rings that can be used to determine age.

**outflow** The amount of applied water and conveyance water leaving the service area. Also conveyance outflow.

## P

**parr** The developmental life stage of salmon and trout when the young have developed parr marks (vertical bars or spots on the sides of the fish) and are actively feeding in fresh water.

**pelagic** Inhabiting the water column as opposed to being associated with the bottom; generally occurring anywhere from the water's surface down to, but not including, the bottom.

**pelagic fish** Fish that live in open water, often near the surface.

**perched groundwater** Groundwater supported by a zone of material of low permeability located above an underlying main body of groundwater.

**perennial yield** The maximum quantity of water that can be annually withdrawn from a groundwater basin over a long period of time without developing an overdraft condition.

**permeability** The capability of soil or other geologic formations to transmit water.

**phytoplankton** Minute plants, such as algae, that live suspended in bodies of water and drift with the current.

**precipitation** A deposit on the earth of hail, rain, mist, sleet, or snow. It is the common process by which atmospheric water becomes surface or subsurface water.

**project yield** The water supply attributed to all features of a project, including integrated operation.

**proposal solicitation package (PSP)** As part of the formal solicitation for grant applications, a PSP provides detailed instructions on the mechanics of submitting proposals and specific information on submittal requirements.

**public trust doctrine** A legal doctrine recognizing public rights in the beds, banks, and waters of navigable waterways, and the State's power and duty to exercise continued supervision over them as trustee for the benefit of the people.

**pump lift** (1) The vertical distance that a pump will raise water. (2) The distance between the groundwater table and the overlying land surface.

**pumped storage project** A hydroelectric power plant and reservoir system using an arrangement whereby water released for generating energy during peak load periods is stored and pumped back into the upper reservoir, usually during periods of reduced power demand.

**pumping-generating plant** A plant that can either pump water or generate electricity, depending on the direction of water flow.

**punch list** A list of tasks or "to-do" items necessary for the completion of a construction project.

## Q

**Quantification Settlement Agreement** A complex package of agreements that defines the rights to a portion of Colorado River water for four water agencies in Southern California, provides for water transfers, and establishes a Joint Powers Authority to oversee restoration of the Salton Sea. The *Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement* was signed in October 2003 by Coachella Valley Water District, Imperial Irrigation District, The Metropolitan Water District of Southern California, the San Diego County Water Authority, and the federal government.

## R

**radial gates** Gates used to control the flow of water into or from a reservoir, canal, or pipeline, or through a channel. Each gate can close under its own weight and is operated independently by remote control.

**radio-telemetry** Automatic measurement and transmission of data from remote sources via radio to a receiving station for recording and analysis.

**rate structure** Designates the rate basis for cost recovery (e.g., flat, uniform, tiered, etc.). Block/tiered rates are assumed to provide cost signals to

consumers. Costs can include capital, operation and maintenance, financing, environmental compliance (documentation, permitting, and mitigation), etc.

**raw water** Water found in the environment, such as rainwater, surface water (e.g., lakes, streams, and the ocean), or groundwater, that has not been treated. Most water is considered raw until it is treated for consumption or used for agriculture or industry.

**reach** On the California Aqueduct, a specific segment of the canal, identified by a number, which is the smallest unit of the SWP identified in water supply contracts for cost allocation and repayment purposes.

**rearing** Refers to the amount of time that juvenile fish spend feeding in nursery areas of rivers, lakes, streams, and estuaries before migration.

**reasonable and prudent alternatives** Alternative actions that can be implemented in a manner consistent with the intended purpose and scope of a project, are economically and technologically feasible, and would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

**recharge** Water added to an aquifer or the process of adding water to an aquifer. Groundwater recharge occurs either naturally as the net gain from precipitation or artificially as the result of human influence.

**recharge basin** A surface facility constructed to infiltrate surface water into a groundwater basin.

**recreation** Water-dependent recreation activities that are consumptive (e.g., parks), flat-water (e.g., boating), or flow-based (e.g., whitewater rafting).

**recycled water** (1) The application of treated water/reclaimed water to meet a beneficial use, supplanting a potable or potentially potable supply. (2) Treated municipal, industrial, or agricultural wastewater to produce water that can be reused.

**redd** A shallow nest of fish eggs covered with gravel in a streambed.

**reference evapotranspiration** ( $ET_0$ ) The evapotranspiration rate from an extended surface of 3 to 6 inch (8 to 15 centimeter) tall green grass cover of uniform height, actively growing, completely shading the ground, and not short on water.

**reliability planning** Water reliability management planning is done by comparing the costs of taking actions to maintain or increase reliability to the costs of accepting less reliability. On this basis, accepting the costs of the adverse effects of less than 100 percent reliability could be a legitimate planning decision. Providing full water supply to meet 100 percent of

projected future water demand is not the planning goal, rather, the goal is to find the justified level of reliability.

**reoperation** See system reoperation.

**repayment reach** California Aqueduct reaches are delineated for the purpose of making project repayment as equitable as possible. The reaches are generally numbered consecutively from the Delta, with Reach 1 being first. Repayment reaches vary greatly in length. (See also, reach.)

**required instream flow** The amount of water required for instream use by agreement, water rights permit, or State/federal acts.

**reused water** The application of previously used water to meet a beneficial use, whether treated or not prior to the subsequent use. (See also, recycled water.)

**return flow** The portion of withdrawn water not consumed by evapotranspiration or system losses which returns to its source or to another body of water.

**reverse osmosis** A method to remove salts and other constituents from water by forcing water through membranes.

**riparian area** The area of land adjacent to a stream, lake, or wetland with vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas. Riparian areas provide important fish and wildlife habitat.

**riparian [water] right** A right to use surface water derived from the fact that the land in question abuts the banks of a stream or other water source (lake or pond). These rights are senior to most appropriative water rights.

**riprap** A layer of large uncoursed stones, broken rock, boulders, or precast blocks placed in random fashion on the upstream and downstream faces of embankment dams, stream banks, on a reservoir shore, on the sides of a channel, or other land surfaces to protect them from erosion caused by current, wind, wave, and/or ice action. Very large riprap is sometimes referred to as "armoring."

**run (of fish)** A group of fish of the same species whose upstream spawning migration timing is associated with the seasons, e.g., fall, spring, summer, and winter runs. Members of a run may interbreed with fish of another run.

**runoff** The volume of surface flow from an area during a specified period. Natural runoff is the portion of precipitation that runs off the land and makes up the natural flow in rivers. Incidental runoff is the portion of precipitation that would have been used by natural vegetation but now contributes to



runoff. This is a result of roads, paved areas, building roofs, land drainage systems, fields developed for irrigation, and other changes in land use.

## S

**sabellid polychaete** A segmented marine worm that lives in a tube that it builds.

**saline intrusion** The movement of salt water into a body of fresh water. It can occur in either surface water or groundwater bodies.

**salinity** Generally, the concentration of mineral salts dissolved in water. Salinity may be expressed in terms of a concentration, weight (total dissolved solids), electrical conductivity, or osmotic pressure. When describing salinity influenced by seawater, salinity often refers to the concentration of chlorides in the water. (See also, total dissolved solids.)

**salmonid** A fish species belonging to the salmon family, including salmon and trout.

**salt-water barrier** A physical facility or method of operation designed to prevent the intrusion of salt water into a body of fresh water.

**salvage (fish)** At the SWP and Central Valley Project fish protective facilities, fish are removed from export water, transported, and released away from the influence of the water diversion facilities.

**sediment** Soil or mineral material transported by water and deposited in streams or other bodies of water.

**seepage** The gradual movement of water into, through, or from a porous medium. Also, the infiltration of water into the soil from canals, ditches, laterals, watercourses, reservoirs, storage facilities, or other bodies of water, or from a field.

**service area** The geographic area served by a water agency.

**smolt** A juvenile salmonid fish that has assumed the silvery color of the adult and, while migrating toward the ocean, is undergoing physiological changes that will allow it to live in salt water.

**snowpack** The annual accumulation of snow in mountain areas.

**soluble minerals** Naturally occurring substances capable of being dissolved.

**special status species** Plants or animals legally protected under either the federal or California Endangered Species Act or the California Fish and Game Code; those species not currently protected by statute but considered to be rare or endangered under the California Environmental Quality Act; and species considered by the scientific community to be sufficiently rare to qualify for legal protection (e.g., candidate species for listing as threatened or endangered, species of concern to the Department of Fish and Wildlife or U.S. Fish and Wildlife Service, or rare plants identified by the California Native Plant Society).

**species of concern** An informal term referring to a species that might be in need of conservation action.

**spillway** The section of a dam designed to permit water to pass over its crest; a weir or channel taking overflow from the dam. The spillway serves as a safety channel to prevent erosion or overtopping of the dam.

**sprinkler irrigation** A method of irrigation in which the water is sprayed, or sprinkled, through the air to the ground surface.

**stakeholder** Individuals or groups who can affect or be affected by an organization's activities; individuals or groups with an interest or "stake" in what happens as a result of a decision or action.

**State Water Project deliveries** The volume of water imported to a given area through the State Water Project.

**statewide water management systems** These include physical facilities (more than 1,200 State, federal, and local reservoirs, as well as canals, treatment plants, and levees), which make up the backbone of water management in California; and statewide water management programs, which include water-quality standards, monitoring programs, economic incentives, water-pricing policies, and statewide water-efficiency programs such as appliance standards, labeling, and education.

**strategic plan** The long-term goals of an organization or program and an outline of how the goals will be achieved (e.g., adopting specific strategies, approaches, and methodologies).

**stocking** Releasing hatchery-raised fish into a water body for the purposes of supplementing existing populations or creating new ones for fishing (also referred to as "planting").

**streamflow** The rate of water flow past a specified point in a channel.

**subsidence** See land subsidence.

**surface storage** Surface storage uses reservoirs to collect water for later release and use.

**surface supply** Water supply obtained from streams, rivers, lakes, and reservoirs.

**system reoperation** Changes to existing water system operations and management procedures for existing reservoirs and conveyance facilities to increase their water-related benefits.

## T

**threatened species** An animal or plant species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

**tidal wetlands** The margins of an estuary that are periodically inundated by tides; includes all habitats within the elevation range between the lowest and highest tides: intertidal mudflats, regularly inundated tidal marsh plains, tidal channels within the marsh, and infrequently inundated wetland-upland transition zones at the edge of the upland.

**total capital cost** The total monetary cost of options required for “turnkey” implementation, including environmental and third-party impact mitigation, storage, conveyance, energy, capitalized operations and maintenance, administrative costs, planning costs, legal costs, and engineering costs.

**total dissolved solids** The quantity of the residual minerals dissolved in water that remain after evaporation of a solution.

**transpiration** An essential physiological process in which plant tissues give off water vapor into the atmosphere.

**tributary** A stream that flows into a larger stream or other body of water.

**tubificid worm** An aquatic worm with a small, thin, segmented body.

**turbidity** A measure of the cloudiness of water caused by the presence of suspended particles in the water that attenuate or reduce light penetration. Turbidity in natural waters may be composed of organic and/or inorganic constituents and may have direct implications to drinking water treatment.

**turnout** The point at which water is diverted from a main channel or water delivery facility to a distributing facility; a structure through which a water contractor takes delivery of water.

**U**

**unimpaired flow** The flow past a specified point on a natural stream that is unaffected by stream diversion, storage, import, export, return flow, or change in use caused by modifications in land use.

**unimpaired runoff** A representation of the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds.

**Urban Water Management Planning Act** Sections 10610 through 10657 of the California Water Code. The act requires urban water suppliers to prepare urban water management plans that describe and evaluate sources of water supplies, efficient uses of water, demand management measures, implementation strategies and schedules, and other relevant information and programs within their water service areas. Urban water suppliers (Section 10617) are either publicly or privately owned and provide water for municipal purposes, either directly or indirectly, to more than 3,000 customers or supply more than 3,000 acre-feet of water annually.

**urban water use** The use of water for urban purposes, including residential, commercial, industrial, recreation, energy production, military, and institutional classes. The term is applied in the sense that it is a kind of use rather than a place of use.

**urban water use efficiency** Methods or technologies resulting in the same beneficial residential, commercial, industrial, and institutional uses with less water or increased beneficial uses from existing water quantities.

**V**

**vernal pools** A type of wetland that occurs in shallow foothill and valley depressions. Water remains in pools and swales until it evaporates, usually within a few days to a few months, mainly in late winter and spring.

**volatile organic compound (VOC)** A man-made organic compound that readily vaporizes in the atmosphere. These compounds are often highly mobile in the groundwater system and are generally associated with industrial activities.

**W**

**wastewater** Domestic or municipal sewage or effluent from an industrial process.

**water demand** The desired quantity of water that would be used if the water were available and if a number of other factors, such as price, did not change. Demand is not static.

**water exchange** Typically, water delivered by one water user to another water user; the receiving water user will return the water at a specified time or when the conditions of the parties' agreement are met. (See also, water transfer.)

**water quality** Description of the chemical, physical, and biological characteristics of water, usually with regard to its suitability for a particular purpose or use.

**water quality objectives** Specific, legally enforced levels of water quality desired for identified uses including drinking, recreation, fish production or propagation of other aquatic life, agriculture, industry, and urban use.

**water recycling** The process of treating wastewater, rendering it suitable for beneficial use.

**water right** In water law, the right of a user to use water from a water source (e.g., a river, stream, pond, or source of groundwater).

**water service reliability** The degree to which a water service system can successfully manage water shortages.

**water supply exports** The amount of water that a region transfers to another to meet needs.

**water table** See groundwater table.

**water transfer** A temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer or exchange of water or water rights. A more general definition is that water transfers are a voluntary change in the way water is usually distributed among water users in response to water scarcity.

**water year** A continuous 12-month period for which hydrologic records are compiled and summarized. Different agencies may use different calendar periods for their water years. For DWR, a water year is October 1 through September 30.

**watershed** The land area from which water drains into a stream, river, or reservoir. Also called drainage area, drainage basin, or river basin.

**watershed management** The process of evaluating, planning, managing, restoring, and organizing land and other resource use within an area that has a single common drainage point.



**weir** (1) Any structure across a watercourse used to control, raise, or measure flows. (2) A barrier constructed to catch upstream migrating adult fish.

**wetlands** Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mud flats, and natural ponds. An area characterized by periodic inundation or saturation, certain types of soils, and vegetation adapted for life in saturated soil conditions.

**Wild and Scenic River systems** State and federally designated river systems under the 1968 national Wild and Scenic Rivers Act and the 1972 California Wild and Scenic Rivers Act. Seventeen rivers in California, including many forks and tributaries, are designated wild, scenic, or recreational.

**wheel** As applied to water and power, to provide the use of one agency's conveyance facilities for the purpose of transporting another agency's supply.

## X

**X2** Delta outflow interaction with tides determines the location of the X2 isohaline salinity gradient. X2 is the location in the Bay-Delta Estuary where the tidally averaged bottom salinity is 2 parts per thousand. It is expressed as the distance in kilometers from the Golden Gate Bridge. X2 is used as a primary indicator in managing Delta outflow.

## Z

**zooplankton** Small aquatic animals that are suspended or swimming in water.

**Appendix B**

**Data and Computations**

**Used to**

**Determine 2015 Water Charges**

Appendix B, Data and Computations Used to Determine 2015 Water Charges, was previously printed and distributed under an August 2014 cover letter from Robert Cooke, Chief of SWPAO, to State Water Project water contractors to document and support DWR's calculation of the contractors' annual charges. Appendix B appears on the following pages as it was published in August 2014. However, Table B-7 was not published in the August 2014 version of Appendix B because the data was not available at the time of publication. Table B-7 now appears in its entirety on page B-76.



**DEPARTMENT OF WATER RESOURCES**

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SACRAMENTO, CA 94236-0001  
(916) 653-5791



August 8, 2014

State Water Project Contractors:

We have completed the annual review and redetermination of all water supply and financial aspects of the State Water Project as required by the water supply contracts. This report presents the data and computations used by the State of California in determining the long-term water supply contractors' Statements of Charges to be paid in calendar year 2015.

The information contained herein is published in compliance with Article 22(f) and Article 29(e) of the water supply contracts.

The report, Bulletin 132-14, Appendix B, will also be published as part of the Department of Water Resources' Bulletin 132-14.

Sincerely,

A handwritten signature in cursive script that reads "Robert B. Cooke".

Robert B. Cooke, Chief  
State Water Project Analysis Office





## Appendix B Data and Computations Used to Determine 2015 Water Charges

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## Appendix B Data and Computations Used to Determine 2015 Water Charges

The Department of Water Resources (DWR) annually furnishes Statements of Charges to the 29 State Water Project (SWP) water supply contractors. Article 29(e) of the *Standard Provisions for Water Supply Contract*, approved August 3, 1962, describes those statements:

“All such statements shall be accompanied by the latest revised copies of the document amendatory to Article 22 and of Tables B, C, D, E, F, and G of this contract, together with such other data and computations used by the State in determining the amounts of the above charges as the State deems appropriate.”

To comply with Article 29(e), DWR performs an annual comprehensive review and redetermination of all water supply and financial aspects of the SWP for the entire project repayment period. This annual redetermination is performed in accordance with Article 22(f) and Article 28 of the water supply contracts, which concern the Delta Water Rate and annual transportation charges, respectively.

Appendix B includes data used to document the redetermination of water charges to be paid by contractors during calendar year 2015. The information is based on established data about the SWP, both known and projected, as of June 2014; however, small volumes of water may be reclassified over time pursuant to water supply contract provisions. If research requires more current data than was available at the time of

production of Bulletin 132, please contact the State Water Project Analysis Office. Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

The computational procedures and interrelationships between tabulations in this appendix are outlined on *Figures B-1* and *B-2*. All tables referenced on Figures B-1 and B-2 follow this text.

### Types of Water Charges

Charges to SWP water supply contractors include the costs of facilities for the conservation and development of a water supply and the conveyance of such supply to SWP service areas. These facilities are classified as “Project Conservation Facilities” and “Project Transportation Facilities” in the *Standard Provisions for Water Supply Contract*. Names of the main facilities in each classification follow.

#### Project Conservation Facilities

- Frenchman Dam and Lake
- Grizzly Valley Dam and Lake Davis
- Antelope Dam and Lake
- Oroville Dam and Lake Oroville
- Oroville power facilities
- Delta facilities
- A portion of the California Aqueduct from the Delta to Dos Amigos Pumping Plant
- Sisk Dam, San Luis Reservoir, and Gianelli Pumping-Generating Plant



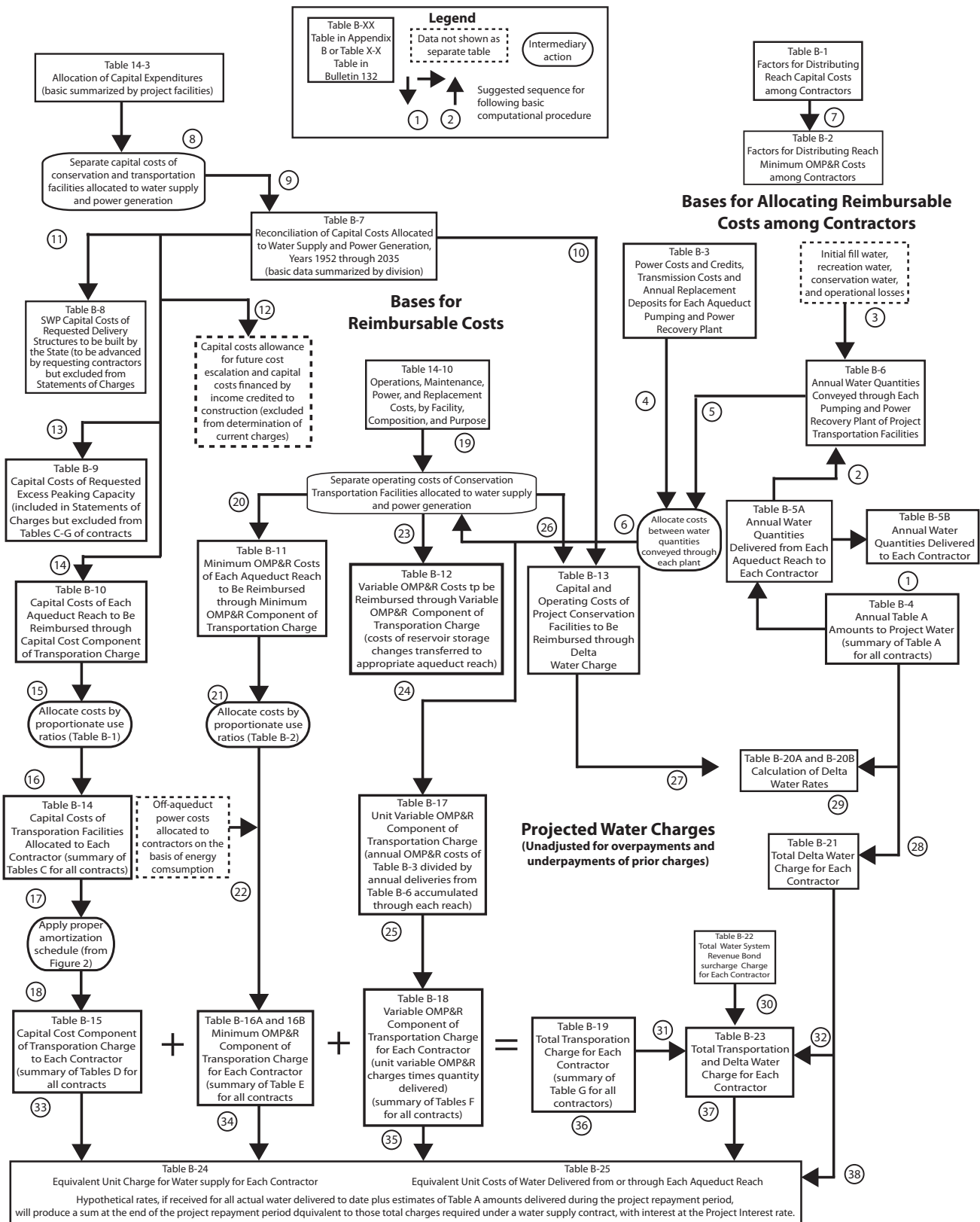
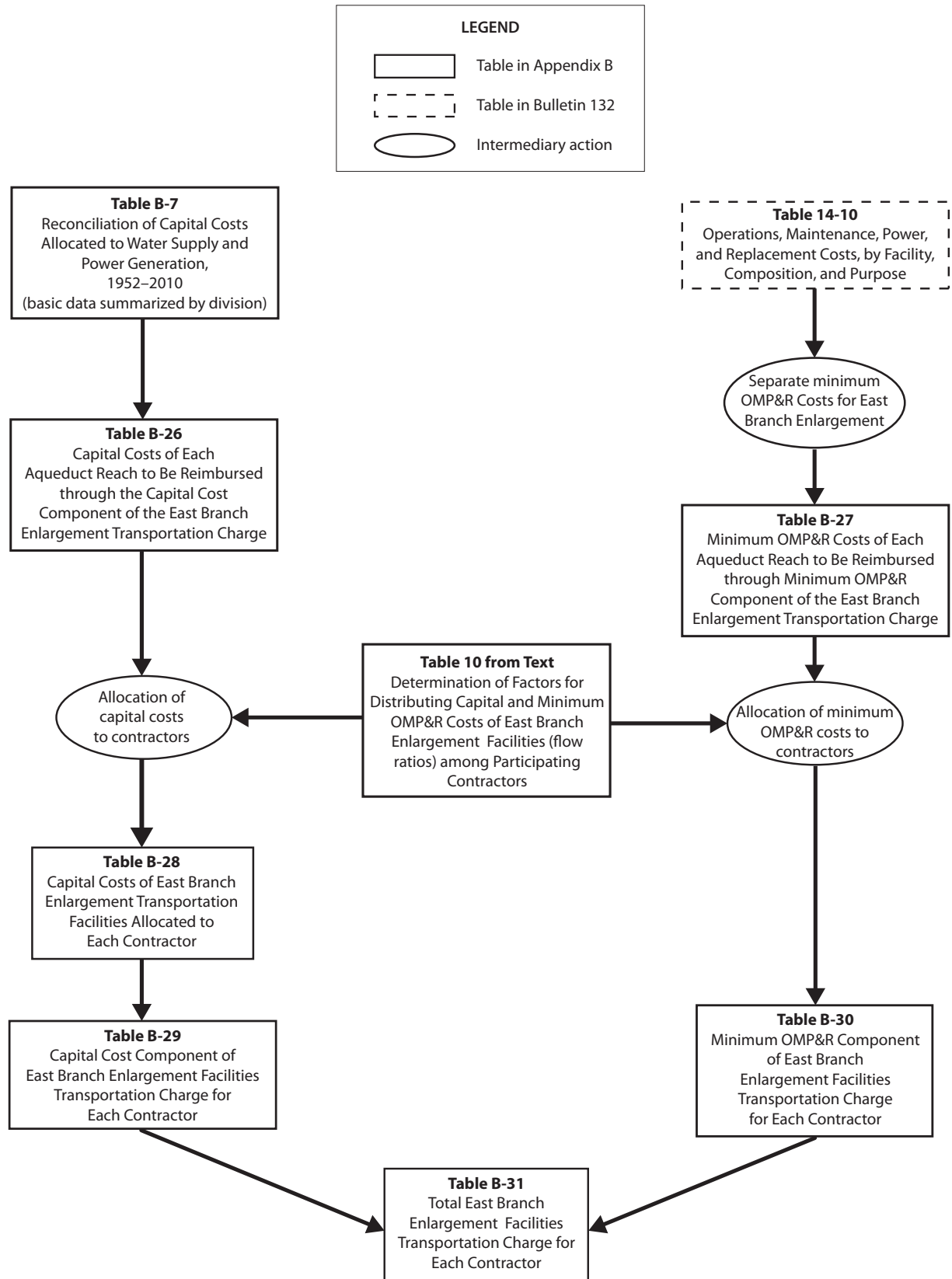


Figure B-1 Relationships of Data Used to Substantiate Statements of Charges



**Figure B-2 Relationships of Data Used to Substantiate East Branch Enlargement Charges**

### Project Transportation Facilities

- Grizzly Valley Pipeline
- North Bay Aqueduct
- South Bay Aqueduct, including Del Valle Dam and Lake del Valle
- the remainder of the California Aqueduct from the Delta to Dos Amigos Pumping Plant and all facilities south, including dams and lakes in Southern California
- Off-Aqueduct Power Facilities (Reid Gardner Unit No. 4, Bottlerock Powerplant, and South Geysers Powerplant)

The standard provisions provide for a Delta Water Charge and a Transportation Charge for project water.

The Delta Water Charge is a unit charge applied to each acre-foot of SWP water the contractors are to receive, in accordance with their contracts. The unit charge, if applied to each acre-foot of all such allocations for the remainder of the project repayment period, is calculated to result in repayment of all outstanding reimbursable costs of the Project Conservation Facilities, with appropriate interest, by the end of the repayment period (2035).

The Transportation Charge is for use of facilities to transport water to the vicinity of each contractor's turnout(s). Generally, the annual charge represents each contractor's proportionate share of the reimbursable capital costs and operating costs of the Project Transportation Facilities.

Each contractor's allocated share of those reimbursable capital costs is amortized for repayment to the State, and certain variations are allowed in the amortization methods. Contractors' shares of reimbursable operating costs are repaid in the year such costs are incurred by the State.

The East Branch Enlargement Transportation Charge is paid by the seven Southern California contractors participating in the enlargement. San Bernardino Valley Municipal Water District advanced funds to pay the district's allocated capital costs for the East Branch Enlargement. The remaining six contractors pay an allocated share of the debt service on revenue bonds sold to finance the enlargement. Each contractor will also pay an allocated share of the minimum operation, maintenance, power, and replacement (OMP&R) costs of the East Branch Enlargement.

Transportation charges for the Coastal Branch Extension, East Branch Extension, and South Bay Enlargement are being repaid by contractors in their respective service areas.

Transportation charges for the Tehachapi Afterbay are repaid by those contractors using electrical power for delivery of their Table A water downstream of the Tehachapi Afterbay.

## Composition and Timing of Water Charges

As shown on *Figure B-3*, the Delta Water Charge and the Transportation Charge consist of the following three components:

- (1) conservation and transportation capital cost components, which will return to the State all reimbursable capital costs;
- (2) conservation and transportation minimum OMP&R components, which will return to the State all reimbursable operating costs that do not depend on or vary with quantities of water actually delivered to the contractors; and
- (3) a transportation variable OMP&R component, which will return to the State all reimbursable operating costs that depend on and vary with quantities of water actually delivered to the contractors.

## Delta Water Charge

### *Capital Cost Component*

1. Planning, design, right-of-way, and construction costs of Conservation Facilities
2. Operations and maintenance (O&M) costs for newly constructed Conservation Facilities prior to initial operations
3. Activation costs for newly constructed Conservation Facilities
4. Power costs allocated to initial filling of San Luis Reservoir
5. Capitalized O&M costs (major repair work and so forth) for Conservation Facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to State Water Project (SWP) pumping prior to 1986 (Department of Water Resources-Department of Fish and Game agreement)

### *Minimum Operations, Maintenance, Power, and Replacement (OMP&R) Component*

1. Direct O&M costs of Conservation Facilities
2. General O&M costs allocated to Conservation Facilities
  - a. Contractor Accounting Office (portion)
  - b. Financial and contract administration (portion)
  - c. Water rights
  - d. Power planning for SWP facilities (portion)
3. Replacement deposits for SWP control centers (portion)
4. Credits for a portion of Hyatt-Thermalito power generation
5. Power costs and credits related to pumping water to San Luis Reservoir for project operations (storage changes)
6. Value of power used and generated by Gianelli Pumping-Generating Plant
7. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant (Department of Water Resources-Department of Fish and Game agreement)

## Transportation Charge

### *Capital Cost Component*

1. Planning, design, right-of-way, and construction costs of Transportation Facilities
2. Operations and maintenance (O&M) costs for newly constructed Transportation Facilities prior to initial operation
3. Activation costs for newly constructed Transportation Facilities
4. Power costs allocated to initial filling of Southern California reservoirs
5. Capitalized O&M costs (e.g., major repair work) for Transportation Facilities
6. Program costs (portion) to mitigate impacts on current Delta fishery population due to SWP pumping prior to 1986 (Department of Water Resources-Department of Fish and Game agreement)

### *Minimum OMP&R Component*

1. Direct O&M costs of Transportation Facilities
  - a. Headquarters and field divisions (portion)
  - b. Insurance and Federal Energy Regulatory Commission (FERC) costs (portion)
2. General O&M costs related to Transportation Facilities
  - a. Contractor Accounting Office (portion)
  - b. Financial and contract administration (portion)
  - c. Power planning for SWP facilities (portion)
3. Power costs and credits related to pumping water to Southern California reservoirs for project operations (storage changes)
4. Power costs for pumping water to replenish losses from Transportation Facilities
5. Other power costs
  - a. Station service at Transportation Facility power and pumping plants
  - b. Transmission service costs related to "backbone" Transportation Facilities
6. Replacement deposits for SWP control centers (portion)
7. Off-Aqueduct Power Facility costs—bond service, bond cover costs (25 percent of bond service), bond reserves, transmission costs to provide service to "backbone," fuel costs, taxes, and O&M—less power sales allocated to Off-Aqueduct Power Facilities
8. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant (Department of Water Resources-Department of Fish and Game agreement)

### *Variable OMP&R Component*

1. Power purchase costs
  - a. Capacity
  - b. Energy
  - c. Pine Flat Powerplant bond service, O&M, and transmission costs allocated to aqueduct pumping plants
2. Alamo, Devil Canyon, Warne, and Castaic power generation credited at the power plant reach and charged to aqueduct pumping plants
3. Hyatt-Thermalito Diversion Dam Powerplant generation charged to aqueduct pumping plants (credits for this generation are reflected in the Delta Water Rate)
4. Replacement deposits for equipment at pumping plants and power plants
5. Credits from sale of excess SWP system power
6. Program costs (portion) to offset annual fish losses resulting from pumping at Banks Pumping Plant (Department of Water Resources-Department of Fish and Game agreement)

Note: Excludes costs recovered under the East Branch Enlargement Transportation Charge.

**Figure B-3 Composition of Delta Water Charge and Transportation Charge**

The formula for computing the Delta Water Rate, Article 22(f) of the *Standard Provisions for Water Supply Contract*, was designed to ensure that all adjustments for prior overpayments or underpayments of the Delta Water Charge are accounted for in a redetermination of the rate. Since the redetermined rate applies to all future allocations, such adjustments are amortized during the remainder of the project repayment period. This appendix includes a redetermination of the Delta Water Rate for 2015.

Article 28 of the standard provisions stipulates that Transportation Charges be redetermined each year. The tables in Appendix B include the numerical data used in this redetermination. Transportation Charges for prior years through 2014, included in those tables, are the redetermined amounts and do not equal the amounts actually paid by contractors.

As provided under the Water System Revenue Bond Amendment to the water supply contracts, differences between actual payments under the Transportation capital cost component and amounts computed in this redetermination are accumulated with interest and amortized during the remaining years of the contract repayment period. All computations for adjustments are included in the attachments accompanying each contractor's Statement of Charges and are reflected in revised copies of Table C through Table G of the contract, which are also furnished to each SWP contractor in the annual Statements of Charges.

These redeterminations exclude four charges associated with water service other than the Delta Water Charge and the Transportation Charge. The excluded charges (and the manner in which they are treated in this appendix) are outlined below.

- (1) Advances of funds pursuant to Article 24(d) of the standard provisions

for excess capacity constructed by the State at the request of contractors.

- (2) Advances of funds pursuant to Article 10(d) of the standard provisions for delivery structures (turnouts) constructed by the State at the request of contractors. Partial information concerning actual and projected capital costs of such delivery structures is included in this appendix. Statements concerning these costs and data are furnished to the appropriate contractors at various times and are not part of the annual statements.
- (3) Payments for sale and service of surplus water to entities other than contractors, pursuant to Article 21 of the standard provisions, are also excluded. Those payments are generally based on the unit rates shown in Table B-25. Net revenues resulting from noncontractor service are applied as indicated on page 24 of Bulletin 132-71.
- (4) Payments under the Devil Canyon-Castaic contract for costs of the Devil Canyon-Castaic facilities allocable to power generation. Charges billed as a result of the contract are billed separately from those billed as a result of the water supply contract. Information about the treatment of such charges in relation to redetermined Transportation Charges is included in special attachments to the bills of the six participating contractors.

Time and method of payment for corresponding components of the Delta Water Charge and the Transportation Charge are as follows:

- (1) The capital cost components of the Delta Water Charge and the Transportation Charge are paid in two semiannual installments, due January 1 and July 1 of each year, based on statements furnished by the State on or before July 1 of the preceding year.



- (2) The minimum OMP&R components of the Delta Water Charge and the Transportation Charge are paid in 12 equal installments due the first of each month and based on statements furnished by the State on or before July 1 of the preceding year.
- (3) The variable OMP&R component of the Transportation Charge is paid in varying monthly amounts and is due the fifteenth day of the second month following actual water delivery. The charges are projected based on a unit charge per acre-foot established on or before July 1 of the preceding year. Those unit charges may be revised during the year to reflect current power costs and revenues. The unit charges are applied to actual monthly delivery quantities as determined by the State on or before the fifteenth day of the month following actual water delivery.

## Bases for Allocating Reimbursable Costs among Contractors

This section describes procedures for allocating reimbursable costs of Project Transportation Facilities among contractors (see upper right portion of Figure B-1). Those costs do not include annual costs of Off-Aqueduct Power Facilities, which are explained in the “Project Water Charges” section.

### Capital and Minimum OMP&R Costs

*Figure B-4* includes information about the repayment reaches that form the basis for allocating reimbursable costs of the Project Transportation Facilities among contractors.

Allocations of reimbursable capital costs and minimum OMP&R costs of each reach are based on the proportionate maximum use of

that reach by respective contractors under planned conditions of full development.

The derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors was first reported in Bulletin 132-70. The ratios in Bulletin 132-70 were subsequently revised for the North Bay Aqueduct, the South Bay Aqueduct, the California Aqueduct from the Delta to Castaic Lake, and the Coastal Branch.

All the revisions reported in previous bulletins regarding the derivation of ratios that represent the proportionate maximum use of each aqueduct reach by the respective contractors were last reported in Tables B-1 and B-2 of Bulletin 132-91. Under Article 53 of the Monterey Amendment, agricultural contractors may sell up to 130,000 acre-feet of aqueduct capacity to municipal and industrial contractors. The first permanent transfer occurred in 1998. Currently, 114,000 acre-feet of the allowable capacity has been transferred. *Table 1* shows the permanent capacity transfers that have taken place since the Monterey Amendment was implemented in 1995.

*Table B-1* presents the reach ratios currently applicable to reimbursable capital costs. These reach ratios do not reflect the permanent capacity transfers.

*Table B-2* presents corresponding ratios for allocating 2015 and after reimbursable minimum OMP&R costs among contractors. Requested excess capacity is omitted when deriving ratios applicable to capital costs because the capital costs for the excess capacity are paid on an incremental-cost basis and not a proportionate-use basis. However, requested excess capacity is accounted for in the ratios applicable to minimum OMP&R costs.

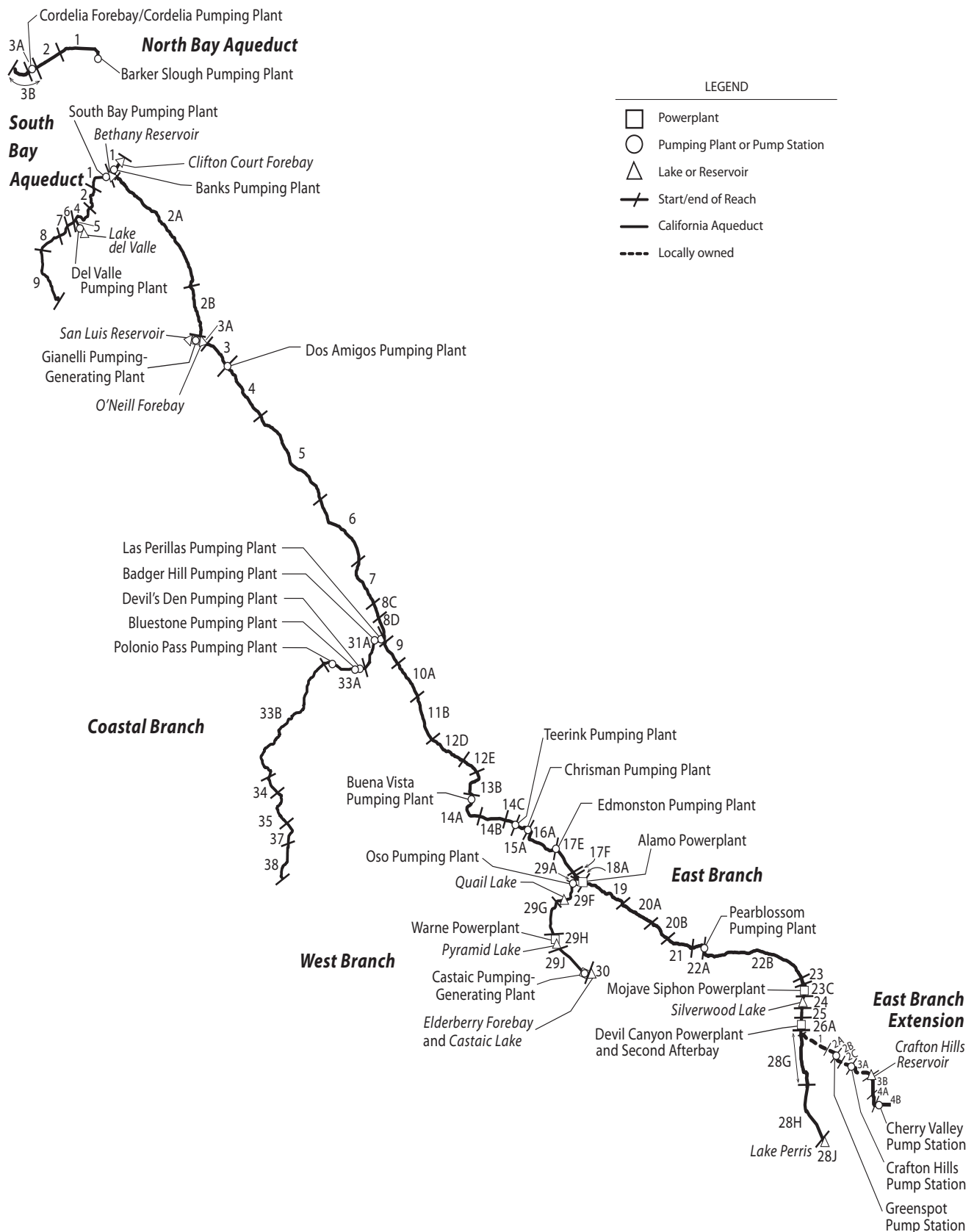


Figure B-4 Repayment Reaches and Descriptions

**North Bay Aqueduct**

- 1 Barker Slough through Fairfield/Vacaville Turnout
- 2 Fairfield/Vacaville Turnout to Cordelia Forebay
- 3A Cordelia Forebay through Benicia and Vallejo Turnouts
- 3B Cordelia Forebay through Napa Turnout Reservoir

**South Bay Aqueduct**

- 1 Bethany Reservoir through Altamont Turnout
- 2 Altamont Turnout through Patterson Reservoir
- 4 Patterson Reservoir to Del Valle Junction
- 5 Del Valle Junction through Lake del Valle
- 6 Del Valle Junction through South Livermore Turnout
- 7 South Livermore Turnout through Vallecitos Turnout
- 8 Vallecitos Turnout through Alameda-Bayside No. 1 Turnout
- 9 Alameda-Bayside No. 1 Turnout through Santa Clara Terminal Facilities

**California Aqueduct****North San Joaquin Division**

- 1 Delta through Bethany Reservoir
- 2A Bethany Reservoir to Orestimba Creek
- 2B Orestimba Creek to O'Neill Forebay

**San Luis Division**

- 3A Sisk Dam, San Luis Reservoir, and Gianelli Pumping-Generating Plant
- 3 O'Neill Forebay to Dos Amigos Pumping Plant
- 4 Dos Amigos Pumping Plant to Panoche Creek
- 5 Panoche Creek to Five Points
- 6 Five Points to Arroyo Pasajero
- 7 Arroyo Pasajero to Kettleman City

**South San Joaquin Division**

- 8C Kettleman City through Milham Avenue
- 8D Milham Avenue through Avenal Gap
- 9 Avenal Gap through Twisselman Road
- 10A Twisselman Road through Lost Hills
- 11B Lost Hills to 7th Standard Road
- 12D 7th Standard Road through Elk Hills Road
- 12E Elk Hills Road through Tupman Road
- 13B Tupman Road to Buena Vista Pumping Plant
- 14A Buena Vista Pumping Plant through Santiago Creek
- 14B Santiago Creek through Old River Road
- 14C Old River Road to Teerink Pumping Plant
- 15A Teerink Pumping Plant to Chrisman Pumping Plant
- 16A Chrisman Pumping Plant to Edmonston Pumping Plant

**Coastal Branch, California Aqueduct**

- 31A Avenal Gap to Devil's Den Pumping Plant
- 33A Devil's Den Pumping Plant through Tank 1
- 33B Tank 1 through Chorro Valley Turnout
- 34 Chorro Valley Turnout through Lopez Turnout
- 35 Lopez Turnout through Guadalupe Turnout
- 37 Guadalupe Turnout to SPRR crossing near Casmalia
- 38 SPRR crossing near Casmalia through terminous at Tank 5 (Outlet Vault)

**Tehachapi Division**

- 17E Edmonston Pumping Plant to Porter Tunnel
- 17F Porter Tunnel to Junction, West Branch

**Mojave Division**

- 18A Junction, West Branch through Alamo Powerplant
- 19 Alamo Powerplant to Fairmont
- 19C Buttes Junction through Buttes Reservoir
- 20A Fairmont through 70th Street West
- 20B 70th Street West to Palmdale
- 21 Palmdale to Littlerock Creek
- 22A Littlerock Creek to Pearblossom Pumping Plant
- 22B Pearblossom Pumping Plant to West Fork Mojave River
- 23 West Fork Mojave River to Silverwood Lake (excluding Mojave Siphon Powerplant)
- 23C Mojave Siphon Powerplant
- 24 Cedar Springs Dam and Silverwood Lake

**Santa Ana Division**

- 25 Silverwood Lake to South Portal, San Bernardino Tunnel
- 26A South Portal, San Bernardino Tunnel through Devil Canyon Powerplant and Second Afterbay
- 28G Devil Canyon Powerplant and Second Afterbay to Barton Road
- 28H Barton Road to Lake Perris
- 28J Perris Dam and Lake Perris

**East Branch Extension**

- 1 Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road
- 2A Junction, Foothill Pipeline near Cone Camp Road to Greenspot Pump Station
- 2B Greenspot Pump Station to Morton Canyon Valve Vault
- 2C Morton Canyon Valve Vault to Crafton Hills Pump Station
- 3A Crafton Hills Pump Station to Carter Street Valve Vault
- 3B Carter Street Valve Vault to Garden Air Creek, South of San Bernardino/Riverside County Line
- 4A Garden Air Creek to Cherry Valley Pump Station
- 4B Cherry Valley Pump Station to Terminus at Noble Creek

**West Branch, California Aqueduct**

- 29A Junction, California Aqueduct through Oso Pumping Plant
- 29F Oso Pumping Plant through Quail Embankment
- 29G Quail Embankment through Warne Powerplant
- 29H Pyramid Dam and Lake
- 29J Pyramid Lake through Castaic Powerplant
- 30 Castaic Dam and Lake

## Variable OMP&R Costs

Article 26(a) includes provisions to ensure that the variable OMP&R component of the Transportation Charge will result in a return to the State of those costs that depend on and vary with the amount of SWP water deliveries. (The minimum OMP&R component results in a return of those operating costs that do not vary with deliveries.) Under Article 26(a) all such costs for a reach for a given year will be allocated among contractors in proportion to the actual annual use of that reach by the respective contractors.

*Table B-3* summarizes the total power costs, credits, and transmission costs for each aqueduct pumping and power recovery plant. Variable costs are the following:

- Costs of capacity and energy used exclusive of associated power transmission and station service charges (transmission and station service costs that are independent and vary with power usage are classified as minimum OMP&R costs).
- Credits for capacity and energy produced at aqueduct power recovery plants (treated as negative costs).
- Payments for replacement of major plant machinery components having economic lives shorter than the project repayment period. (In 1997, DWR discontinued charging for a sinking fund for replacements. Replacement costs, for 1999 and thereafter, are to be paid on an annual basis as the costs are incurred.)
- Beginning in 2005, a portion of transmission expenditures that will depend on and vary with water and power usage. These costs will be included as part of the variable component.

Table B-3 excludes plant capacity and energy costs associated with surplus and unscheduled water service after May 1, 1973.

Prior to that date, surplus water service was charged the same unit variable OMP&R component as allocated water service. An amendment to the water supply contracts in 1973 significantly changed the rate structure for surplus water service. Capacity and energy costs for pumping surplus and unscheduled water were allocated directly to those SWP contractors receiving surplus and unscheduled water service. A contract amendment in 1991 again revised the rate structure to provide for payment of costs through a melded power rate. These revisions to charges for surplus and unscheduled water are effective from the date of the amendments and are not applied to past charges.

An interruptible water program was established in 1994. This program, later renamed as the Article 21 program, is based on individual annual contracts; costs for Article 21 water actually delivered are included in Table B-3.

## Water Conveyance

Tables B-4, B-5A, B-5A-Adj, B-5B, and B-6 present water conveyance quantities that form the basis for allocating costs.

*Table B-4* presents the schedules of annual allocations as set forth in Table A and Article 6(a) of each water supply contract.

*Table B-5A* shows amounts of actual and projected allocated water quantities delivered from each aqueduct reach to each contractor. Projected deliveries for years 2014 through 2035 are based on contractors' requests for future water deliveries. The quantities included in Table B-5A also include nonproject water delivered to contractors, surplus water deliveries prior to May 1, 1973, and actual Article 21 water deliveries in 1994 and thereafter.

**Table 1 Summary of Permanent Aqueduct Capacity Transfers**

Contractor		Capacity Transfer		
Seller	Buyer	Amount (acre-feet)	Effective Year	Transfer Description
<b>Transfers under Monterey Amendment</b>				
Kern	Mojave	25,000	1998	Purchased capacity upstream from Reach 31A
Kern	Castaic Lake	41,000	2000	Purchased capacity upstream from Reach 16A
Kern	Palmdale	4,000	2000	Purchased capacity upstream from Reach 11B
Kern	Alameda-Zone 7	7,000	2000	Purchased capacity upstream from Reach 10A
Kern	Alameda-Zone 7	15,000	2000	Purchased capacity upstream from Reach 10A
Kern	Alameda-Zone 7	10,000	2001	Purchased capacity upstream from Reach 11B
Kern	Solano	5,756	2001	Purchased capacity upstream from Reach 11B and Reach 31A
Kern	Napa	4,025	2001	Purchased capacity upstream from Reach 11B and Reach 31A
Kern	Alameda-Zone 7	2,219	2004	Purchased capacity upstream from Reach 11B
<i>Subtotal under Article 53</i>		<i>114,000</i>		
<b>Transfers outside of Monterey Amendment</b>				
Tulare	Dudley Ridge	3,973	2002	Purchased capacity upstream from Reach 8D
Tulare	AVEK	3,000	2002	Purchased capacity upstream from Reach 8D
Tulare	Alameda-Zone 7	400	2003	Purchased capacity upstream from Reach 8D
Tulare	Kings	5,000	2004	Purchased capacity upstream from Reach 8D
Tulare	Coachella	9,900	2004	Purchased capacity upstream from Reach 8D
Metropolitan	Coachella	88,100	2005	Purchased capacity upstream from Reach 28J
Metropolitan	Desert	11,900	2005	Purchased capacity upstream from Reach 28J
Tulare	Kings	305	2006	Purchased capacity upstream from Reach 31A
Tulare	Desert	1,750	2010	Purchased capacity upstream from Reach 17F
Tulare	Coachella	5,250	2010	Purchased capacity upstream from Reach 17F
Kern	Desert	4,000	2010	Purchased capacity upstream from Reach 17F and Reach 31A
Kern	Coachella	12,000	2010	Purchased capacity upstream from Reach 17F and Reach 31A
Dudley Ridge	Mojave	7,000	2010	Purchased capacity upstream from Reach 8D
Dudley Ridge	AVEK	1,993	2014	Purchased capacity upstream from Reach 8D
Tulare	AVEK	1,451	2014	Purchased capacity upstream from Reach 8D
Dudley Ridge	Mojave	3,000	2015	Purchased capacity upstream of Reach 8D
<i>Subtotal outside of Article 53</i>		<i>159,022</i>		

*Table B-5A-Adj* presents a summary of accounting adjustments that result from water deliveries not originating from the Sacramento-San Joaquin Delta. The methodologies used to calculate various components are based on cumulative charges from the Delta through facilities conveying water to a specific repayment reach. When water is introduced to the SWP downstream of the Delta, contractors require

an adjustment, or credit, for those facilities not used to convey the water.

*Table B-5B* presents a summary of actual and projected annual allocated water quantities for each contractor. The quantities also include amounts of nonproject water and surplus water delivered prior to May 1, 1973, and actual deliveries of Article 21 water in 1994 and thereafter.



Table B-6 summarizes the annual allocated water quantities conveyed or to be conveyed through each aqueduct pumping plant or power plant for each of the following functions:

- *Deliveries-Water Supply.* Water made available to contractors at down-aqueduct delivery structures, including certain hypothetical quantities to facilitate cost allocations, for those years when deliveries are made from net annual storage withdrawals. The net annual amounts of storage withdrawals are hypothetically added to the actual amounts conveyed from the Delta to the reservoirs, since deliveries made from storage withdrawals bear the same variable OMP&R costs per acre-foot as they would if the deliveries were actually conveyed from the Delta in that year. The hypothetical increases in the deliveries made from reservoir storage withdrawals are offset by equal credits to the minimum OMP&R costs of the respective reservoirs. Thus, the variable OMP&R components per acre-foot (Table B-17) may be applied to the total annual quantities delivered either from aqueduct reservoir storage or from the Delta.
- *Initial Fill Water.* Water required for initial filling of down-aqueduct reaches and reservoirs or for repayment of pre-consolidation water used during construction.
- *Deliveries-Recreation.* Water delivered to down-aqueduct recreation developments or used for fish and wildlife enhancement.
- *Operational Losses.* Water lost through evaporation and seepage from all down-aqueduct reaches.
- *Reservoir Storage Changes.* Water placed in down-aqueduct reservoir storage after initial filling of the reservoirs, including projected net annual storage accretions (positive values) and withdrawals (negative values) for all

down-aqueduct reservoirs of the Project Transportation Facilities.

Variable OMP&R costs (Table B-12) that are allocable to storage accretions are assigned to the minimum OMP&R costs of the respective reservoirs. With the exception of Banks Pumping Plant, "Reservoir Storage Changes" also includes SWP water placed into Southern California groundwater storage from 1978 through 1982 (as positive amounts); and water withdrawn from storage and delivered to contractors in 1979, 1982, 1987, 1988, and 1989 (as negative amounts). At Banks Pumping Plant, groundwater additions and withdrawals are included in "Conservation Water."

Table B-6 also summarizes the following two amounts under the heading *Conservation Water* (Column 25):

- (1) Net annual water amounts stored and projected to be stored in San Luis Reservoir.
- (2) Water lost and projected to be lost through evaporation and seepage from San Luis Reservoir and from the water conservation portion of the California Aqueduct.

"Conservation Water" includes initial fill water, operational losses, and net annual storage changes associated with San Luis Reservoir and the portion of the California Aqueduct that is allocated to conservation. The same allocation procedure outlined previously for Transportation Facilities also applies to water delivered from storage in Conservation Facilities, except that the hypothetical cost increases are added to the variable OMP&R cost to be reimbursed through the Transportation Charge and deducted from the minimum OMP&R costs to be reimbursed through the Delta Water Charge.

San Luis Reservoir is operated to conserve water for future delivery to downstream

contractors. To account for costs associated with reservoir storage, the power and replacement costs of Banks Pumping Plant (a joint Transportation-Conservation Facility) that are allocated to the conveyance of annual conservation water quantities are transferred to the capital costs of San Luis Reservoir (during initial fill) or to the minimum OMP&R costs of San Luis Reservoir (following initial fill).

In years of net storage withdrawal from San Luis Reservoir, a portion of the minimum OMP&R cost of the reservoir is transferred to the variable OMP&R cost of Banks Pumping Plant. That transfer is equal to the variable OMP&R cost per acre-foot of delivery through Banks Pumping Plant for that year, multiplied by the acre-feet of deliveries derived from San Luis Reservoir storage for that year. Table B-6 also includes amounts of nonproject water and surplus water delivered prior to May 1, 1973, and actual deliveries of Article 21 water in 1994 and thereafter.

## Bases for Reimbursable Costs

This section describes the methods used to derive the costs allocated by the procedures outlined in the preceding section. A diagram of the cost derivation process is shown in the upper-left quadrant of Figure B-1.

First, the capital and minimum OMP&R costs of all SWP facilities are allocated among the various project purposes in accordance with the allocation percentages in *Table 2*. Those percentages may be subject to revision in the future.

The redeterminations in this appendix involve only the SWP costs that are allocated to water supply and power generation.

## Capital Costs

Capital costs used in the redeterminations in this appendix reflect prices prevailing on

December 31, 2013; future cost escalation will be reflected in subsequent bulletins.

*Table B-7* presents a reconciliation of estimated total capital costs of each Project Conservation Facility and each Project Transportation Facility. This table shows the relationship of Project Conservation and Transportation costs allocated to contractors (Tables B-8, B-9, B-10, and B-13) to the total SWP capital costs projected by DWR.

*Table B-8* shows costs incurred and projected to be incurred by the State in connection with each contractor's turnouts. Costs incurred by the State for both State-constructed and contractor-constructed delivery structures are paid directly by the contractors for which the structures are built. The State incurs design review and construction inspection costs in connection with contractor-constructed turnouts.

*Table B-9* lists costs and payments for excess capacity built into SWP Transportation Facilities in accordance with amendments to contracts with The Metropolitan Water District of Southern California (Metropolitan), San Gabriel Valley Municipal Water District, and Antelope Valley-East Kern Water Agency, including the following:

- additional costs incurred by the State for requested excess capacity;
- advances by SWP contractors of funds for such costs; and
- credits for advances in excess of costs which were applied to respective contractors' installments of the capital cost component of the Transportation Charge in 1981.

Under Amendment 2 of Metropolitan's contract, 809 cubic feet per second of excess capacity was originally constructed in reaches of the West Branch at Metropolitan's request. That capacity was reclassified as basic capacity of SWP Transportation

**Table 2 Project Purpose Cost Allocation Factors (Percentages)<sup>a</sup>**

PROJECT FACILITIES	Water Supply and Power Generation		All Other Purposes (Nonreimbursable)	
	Capital Costs	Minimum OMP&R Costs	Capital Costs	Minimum OMP&R Costs
<b>Project Conservation Facilities</b>				
Frenchman Dam and Lake	21.5	0.0	78.5	100.0
Antelope Dam and Lake	0.0	0.0	100.0	100.0
Grizzly Valley Dam and Lake Davis	1.0	1.8	99.0	98.2
Oroville Division <sup>b</sup>	97.1	99.5	2.9	0.5
California Aqueduct, Delta to Dos Amigos Pumping Plant	96.6	96.7	3.4	3.3
Delta Facilities				
Peripheral Canal Related	86.0	86.0	14.0	14.0
Remaining of Delta Facilities	96.6	96.7	3.4	3.3
<b>Transportation Facilities</b>				
Grizzly Valley Pipeline	100.0	100.0	0.0	0.0
North Bay Aqueduct	100.0	100.0	0.0	0.0
South Bay Aqueduct				
Del Valle Dam and Lake del Valle	25.2	22.0	74.8 <sup>b</sup>	78.0 <sup>c</sup>
Remainder of South Bay Aqueduct	100.0	100.0	0.0	0.0
California Aqueduct				
Delta to Dos Amigos Pumping Plant	96.6	96.7	3.4	3.3
Dos Amigos Pumping Plant to termini (excluding Coastal Branch) <sup>e,f</sup>	94.3 / 99.6	96.9 / 99.6	5.7 / 0.4	3.1 / 0.4
Aqueduct and Plants <sup>e,f</sup>	94.3 / 99.6	96.9 / 99.6	5.7 / 0.4	3.1 / 0.4
Pyramid Dam and Lake <sup>e,f</sup>	94.3 / 96.1	96.9 / 96.1	5.7 / 3.9	3.1 / 3.9
Castaic Dam and Lake <sup>e,f</sup>	94.3 / 91.1	96.9 / 91.1	5.7 / 8.9	3.1 / 8.9
Silverwood Dam and Lake <sup>e,f</sup>	94.3 / 85.3	96.9 / 85.3	5.7 / 14.7	3.1 / 14.7
Perris Dam and Lake <sup>e,f</sup>	94.3 / 67.7	96.9 / 67.7	5.7 / 32.3	3.1 / 32.3
Coastal Branch	100.0	100.0	0.0	0.0

<sup>a</sup> Percentages indicated apply to the majority of the facilities with minor exceptions.

<sup>b</sup> Percentages indicated are applicable to the remaining costs of division after excluding costs allocated to flood control that are reimbursed by the federal government (22 percent of capital costs) and excluding specific power costs of Hyatt and Thermalito powerplants and switchyards.

<sup>c</sup> Percentage indicated consists of 48.0 percent of costs allocated to recreation and 26.8 percent to flood control.

<sup>d</sup> Percentage indicated consists of 44.9 percent of costs allocated to recreation and 33.1 percent to flood control.

<sup>e</sup> Percentage indicated is used for 2012 and previous years.

<sup>f</sup> Percentage indicated is used for 2013 and forward.

Facilities under Amendment 7. Metropolitan paid \$16.3 million as a prepayment of the capital cost component of the Transportation Charge in lieu of advancing funds for the original requested capacity.

Amendment 5 to Metropolitan's contract requires that additional costs for modifications to the Santa Ana Pipeline (required for enlargement of Lake Perris) will be allocated to Metropolitan and returned

to the State through payments of the Transportation Charge. The additional costs to be repaid through Metropolitan's capital cost component for the aqueduct reach from Devil Canyon Powerplant to Barton Road total about \$6.7 million (see Bulletin 132-72, page 98).

Table B-10 presents the actual and projected annual capital costs of each aqueduct reach that will eventually be returned to the

State, with interest, through contractors' payments of the capital cost component of the Transportation Charge and payment of debt service under the Devil Canyon-Castaic contracts.

### Annual Operating Costs

Annual operating costs allocable to water supply and power generation are returned to the State through the minimum OMP&R components of the Delta Water Charge and the Transportation Charge and through a portion of the revenues from energy sales. All reimbursable operating costs of Conservation Facilities are included in the minimum OMP&R component of the Delta Water Charge.

### Transportation and Devil Canyon-Castaic Contract Costs

*Table B-11* shows the amounts of the actual and projected costs to be reimbursed through payments of the minimum OMP&R component of the Transportation Charge and allocated operating costs under the Devil Canyon-Castaic contract. The table includes the following seven types of operating costs incurred annually that do not vary with water quantities delivered to the contractors:

- (1) all direct labor charges for field operation and maintenance personnel, including associated indirect costs;
- (2) a distributed share of general operating costs that cannot be identified solely with one facility or aqueduct reach;
- (3) all of electric power transmission and station service costs up to 2004, and electric power transmission and station service costs for 2005 and after that do not vary with power usage allocable to aqueduct pumping and recovery plants;
- (4) all costs for equipment, materials, and supplies;
- (5) portions of the power and replacement costs of all up-aqueduct pumping plants and power plants that are allocable

to the annual conveyance of water lost to evaporation and seepage from respective aqueduct reaches or placed into storage in respective reservoirs of the project transportation facilities (after initial fill);

- (6) credits, which offset those costs in (5) above, for deliveries drawn from reservoir storage; and
- (7) escalation of projected operating costs at 12.5 percent per year for 2014, 4.5 percent for 2015 and 2016, and escalation of projected operating costs at 1 percent per year for 2017-2035.

*Table B-12* shows the portions of variable OMP&R costs in *Table B-3* that are allocable to the water supply delivery quantities included in *Table B-6* and reimbursed through payments of the variable OMP&R component of the Transportation Charge.

To derive *Table B-12* costs, the following adjustments are made to *Table B-3* costs.

- (1) Part of the variable OMP&R costs of each plant is allocated to recreation. The allocation to recreation is in proportion to the quantity of water conveyed through each plant each year for delivery to on-shore recreational developments. That portion of variable plant costs attributable to the initial fill of aqueduct reaches is allocated to the joint capital costs of respective down-aqueduct reaches and reservoirs.
- (2) That portion of costs attributable to evaporation and seepage is allocated to the joint minimum OMP&R costs of respective down-aqueduct reaches and reservoirs.
- (3) Adjustments are made for additions or withdrawals from storage in aqueduct reservoirs. In years when water is added to storage in aqueduct reservoirs, the cost of conveying this water into storage is charged to the minimum OMP&R costs of the corresponding reservoir. In years when storage in



aqueduct reservoirs is decreased for the purpose of making deliveries, a credit is applied to the minimum OMP&R costs of the reservoir from which the storage is released. This credit is equal to the number of acre-feet of storage reduction times the variable OMP&R unit rate for the year the storage is released. The unit rate is equal to the variable OMP&R unit rate for the year the water is taken from storage.

- (4) That portion of costs attributable to pumping water to replace evaporation and seepage losses and for additions or withdrawals from storage in San Luis Reservoir is charged to the minimum OMP&R component of the Delta Water Rate.

The remaining costs are allocated to transportation water supply and repaid by the contractors.

## Conservation Capital and Operating Costs

*Table B-13* is a summary of actual and projected capital and operating costs of the initial Project Conservation Facilities. These costs are reimbursed through payments by contractors under the Delta Water Charge, Oroville power sales, and Gianelli Pumping-Generating Plant credits. *Table B-13* also shows credits applied to the reimbursable capital costs of the initial Project Conservation Facilities in accordance with negotiated settlements concerning incurred planning costs for the period from 1952 through 1978.

## Project Water Charges

This section describes the redetermination of past and projected components of the Transportation Charge for annual revision of Tables C through G of each water supply contract. This section also describes the derivation of the unit Delta Water Rates and the Water System Revenue Bond Surcharge.

A summary of equivalent unit charges for each acre-foot of allocated water service is also included for each contractor and each aqueduct reach. A diagram of all calculations may be found on the lower half of Figure B-1.

## Transportation Charges

The accumulation of allocated costs of each aqueduct reach to each contractor is the basis for the Transportation Charge components.

*Table B-14* summarizes each contractor's share of the capital costs of the aqueduct reaches presented in *Table B-10*. Those amounts are determined by applying proportionate-use ratios set forth in *Table B-1* to the costs in *Table B-10*. The resulting allocated costs are set forth in *Table C* of the respective water supply contracts.

Prepayments of the capital cost component, required under Metropolitan's Amendment 7, are included as negative capital costs in *Table B-14* and *Table C* of Metropolitan's Statement of Charges. Solano County Water Agency, Empire-West Side Irrigation District, and Castaic Lake Water Agency also prepaid capital costs (see *Table B-14* footnotes). *Table B-14* includes costs of the East Branch Extension to provide water service to San Bernardino Valley Municipal Water District (San Bernardino) and San Geronio Pass Water Agency (San Geronio).

Both *Table B-14* and *Table C* of the six contractors for project water service below Devil Canyon Powerplant and Castaic Powerplant include the capital costs reimbursable under the Devil Canyon-Castaic contract.

*Table B-15* summarizes capital cost components of the Transportation Charge for each contractor for each year of the project repayment period. By the year 2035, the capital cost components shown in



Table B-15 will recover the costs shown in Table B-14, with interest at the Project Interest Rate of 4.610 percent per annum and based on the amortization schedules included in *Table 3*.

Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in Table D of the water supply contracts. Costs of excess capacity are billed separately and are not included in Table B-15.

Table B-15 includes the debt service payments due from the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant, in accordance with terms of the Devil Canyon-Castaic contract.

*Table B-16A* summarizes the minimum OMP&R components of the Transportation Charge for each year of the project repayment period. Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in Table E of the respective water supply contracts.

The total amounts included in Table B-16A are determined by applying the proportionate-use ratios in Table B-2 to the reach costs in Table B-11.

Table B-16A excludes Off-Aqueduct Power Facility charges, which are included separately in Table B-16B. Both Table B-16A and Table E include the operating costs payable under the Devil Canyon-Castaic contract for the six contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant.

As part of operating agreements with DWR, Kern County Water Agency was billed from 1963 through 1987 for any additional operating costs caused by early installation of units in Las Perillas and Badger Hill pumping plants by Berrenda Mesa Water

**Table 3 Criteria for Amortizing Capital Costs of Transportation Facilities**

Contractor	Year of Initial Payment <sup>a</sup>
Alameda County Flood Control and Water Conservation District, Zone 7	1963 <sup>b</sup>
Alameda County Water District	1963
Antelope Valley-East Kern Water Agency	1963
Castaic Lake Water Agency	1964
City of Yuba City	c
Coachella Valley Water District	1964
County of Butte	c
County of Kings	1968
Crestline-Lake Arrowhead Water Agency	1964
Desert Water Agency	1963 <sup>d</sup>
Dudley Ridge Water District	1968 <sup>e</sup>
Empire West Side Irrigation District	1968 <sup>e</sup>
Kern County Water Agency	
Agricultural Use	1968 <sup>e</sup>
Municipal and Industrial Use	1968 <sup>e</sup>
Littlerock Creek Irrigation District	1964
The Metropolitan Water District of Southern California	1963
Mojave Water Agency	1964
Napa County Flood Control and Water Conservation District	1966
Oak Flat Water District	1968
Palmdale Water District	1964
Plumas County Flood Control and Water Conservation District	1970
San Bernadino Valley Municipal Water District	1963
San Gabriel Valley Municipal Water District	1963 <sup>d</sup>
San Geronio Pass Water Agency	1963 <sup>d</sup>
San Luis Obispo County Flood Control and Water Conservation District	1964 <sup>f</sup>
Santa Barbara County Flood Control and Water Conservation District	1964
Santa Clara Valley Water District	1963
Solano County Water Agency	1973
Tulare Lake Basin Water Storage District	1968 <sup>e</sup>
Ventura County Watershed Protection District	1964

<sup>a</sup> Allocated capital costs of transportation facilities amortized in equal annual installments unless otherwise noted.

<sup>b</sup> Principal payments on each annual capital cost prior to 1971 delayed until calendar year 1972, except payments for 1963.

<sup>c</sup> For City of Yuba City and County of Butte, payments for Delta Water Charge only.

<sup>d</sup> Payment deferred for 1963 and added to 1964 payment with accrued interest.

<sup>e</sup> For Dudley Ridge, Empire, Kern (agricultural use), Oak Flat, and Tulare, according to Article 45 of the contracts for supply of agricultural water, capital costs of transportation facilities allocated to agricultural water supply are amortized by using an equivalent unit rate per acre-foot applied to the annual allocations (Table B-4) through the project repayment period.

<sup>f</sup> For San Luis Obispo and Santa Barbara, all principal and interest payments for costs of the Coastal Stub were deferred until 1976.

Storage District (see Bulletin 132-71, page 7). Under those agreements, a portion of minimum OMP&R costs of Reach 31A were assigned directly to Kern, as shown in *Table 4*, with the remaining reach costs allocated by application of the proportionate-use ratios. DWR purchased the last unit, Unit No. 6, at Las Perillas and Badger Hill pumping plants in early 1997 to provide

**Table 4 Minimum OMP&R Costs of Reach 31A Assigned Directly to Kern County Water Agency (in dollars)**

Year	Direct Charges
1969	46,511
1970	46,302
1971	140,074
1972	95,017
1973	72,454
1974	100,692
1975	127,456
1976	138,504
1977	120,753
1978	157,652
1979	121,231
1980	150,728
1981	75,866
1982	82,805
1983	90,007
1984	107,468
1985	159,406
1986	137,241
1987	127,073
1988	130,924
1989	128,468
1990	138,234
1991	139,527
1992	185,370
1993	219,334
1994	364,196
1995	272,341
1996	322,123
<b>Total</b>	<b>3,997,767</b>

pumping capacity for deliveries to Coastal Area contractors, which began in 1997.

As a result of the Monterey Amendment, the costs related to this settlement are to be allocated among all SWP contractors in proportion to their maximum Table A amounts. As costs are incurred, related charges will be included in the contractors' annual Statements of Charges as part of the minimum. Between 2002 and 2010, the Monterey Amendment litigation costs recovered from SWP contractors were \$15.8 million.

*Table B-16B* summarizes annual Off-Aqueduct Power Facility charges allocated to each water contractor, adjusted for prior overpayments or underpayments. Those charges are to repay all Off-Aqueduct Power costs, including bond service, deposits for reserves, operation and maintenance costs, fuel costs, taxes, and insurance.

Adopted October 1, 1979, the General Bond Resolution requires that sufficient revenues be collected each year to repay all of those costs. In addition, an amount totaling 25 percent of the annual bond service is collected each year to ensure that sufficient funds are available to cover all annual costs. Any revenues collected and not needed during the year are refunded to the contractors in the next year.

*Table 5* summarizes Off-Aqueduct Power Facility charges and credits related to deliveries for 2013. The Reid Gardner Powerplant Closure costs related to the Reid Gardner Powerplant contract expiration in 2013 are tracked independently from annual Reid Gardner operating costs.

*Table 6* shows projected Off-Aqueduct Power Facility charges and an amount equal to 25 percent of annual bond service for 2014 through 2035.

**Table 5 Summary of 2013 Off-Aqueduct Power Facility Charges and Credits (in dollars)**

<b>Charges by Item</b>	
Reid Gardner Powerplant	39,013,517
Reid Gardner Closure Costs	16,257,353
Bottle Rock Powerplant	16,407,583
South Geysers Powerplant	7,342,245
<i>Subtotal</i>	<i>79,020,698</i>
<b>Credits by Item</b>	
Power Sales	(1,069,400)
<b>Net Total Charge</b>	<b>77,951,298</b>

**Table 6 Projected Charges for Off-Aqueduct Power Facilities (in dollars)**

<b>Year</b>	<b>Total Annual Cost</b>	<b>25 Percent Bond Cover</b>
2014	43,856,442	3,940,739
<b>2015</b>	<b>21,332,906</b>	<b>2,307,581</b>
2016	9,917,696	1,978,590
2017	9,728,690	1,940,789
2018	3,914,799	778,011
2019	3,905,256	776,102
2020	4,239,144	842,880
2021	6,193,301	1,233,711
2022	5,865,991	1,168,249
2023	4,304,706	855,992
2024	3,218,876	638,826
2025	526,990	100,449
2026	660,980	127,247
2027	983,864	191,824
2028	682,671	131,585
2029	679,508	130,953
2030	203,730	35,797
2031	203,261	35,703
2032	208,542	36,759
2033	206,917	36,434
2034	204,964	36,044
2035	208,933	36,838

Annual Off-Aqueduct Power Facility charges are allocated among contractors in proportion to the electrical energy required to pump allocated water for the year. The initial allocation for the Statements of Charges is based on estimates of energy to pump requested allocated water deliveries, based on a 60-percent allocation.

An interim adjustment in the allocation of Off-Aqueduct Power costs may be made in May of each year, based on updated cost estimates and April revisions in water delivery schedules. An additional adjustment is made the following year based on actual water deliveries and actual costs for the year.

The energy required to pump each contractor's water is calculated using the kilowatt-hour per acre-foot factors shown in *Table 7* for the pumping plants upstream from the delivery turnouts. The amounts shown include transmission losses.

*Table B-17* presents a summary of actual and projected total variable OMP&R costs for each acre-foot conveyed through each aqueduct pumping plant and power plant for each year of the project. Following are provisions for calculating the variable OMP&R component of the Transportation Charge:

- An annual charge per acre-foot of projected water deliveries to all contractors served from or through each reach is determined so the projected variable OMP&R costs to be incurred for each reach will be returned to the State.
- The total annual variable OMP&R component for any contractor for a given reach is obtained by multiplying the unit charge associated with that reach by the quantity of water actually delivered from or through the reach to the contractor.

The data summarized in *Table B-17* are derived by dividing the costs shown in *Table B-3* by the water quantities shown in

**Table 7 Kilowatt-Hour per Acre-Foot Factors for Allocating Off-Aqueduct Power Facility Costs**

Pumping Plant	kWh per acre-foot <sup>a</sup>	
	At Plant	Cumulative from Delta
Barker Slough	223	223
Cordelia-Benicia	434	657
Cordelia-Vallejo	178	401
Cordelia-Napa	563	786
Banks (Delta)	296	296
South Bay (including Del Valle)	869	1,165
Dos Amigos	138	434
Buena Vista	242	676
Teerink	295	971
Chrisman	639	1,610
Edmonston	2,236	3,846
Pearblossom	703	4,549
Greenspot	871	5,420
Crafton Hills	1,087	6,507
Cherry Valley	224	6,731
Oso	280	4,126
Las Perillas	77	511
Badger Hill	200	711
Devil's Den	705	1,416
Bluestone	705	2,121
Polonio Pass	705	2,826

<sup>a</sup>Includes transmission losses.

Table B-6. However, certain costs included in Table B-3 for extra peaking service, which would otherwise constitute variable OMP&R costs, are assigned directly to contractors requesting this type of service (see Bulletin 132-71, page 21, and Water Service Contractors Council Memo No. 593, July 10, 1970). Those costs are excluded from the unit charges shown in Table B-17. Peaking charges based on additional capacity ceased in 1983. Since 1984, costs are based on power market energy rates. The amounts of extra peaking charges for additional power costs are shown in *Tables 8 and 9*.

Unit rates shown in Table B-17 constitute the rates for the pumping plants and power plants listed. The cumulative rates constitute the total rates, cumulative from the Sacramento-San Joaquin Delta, and are applicable to deliveries from or downstream of the pumping plants and power plants. Extra peaking service costs are excluded.

*Table B-18* shows the variable OMP&R components of the Transportation Charge for each contractor for each year of the project repayment period. *Table B-18* is developed from the costs per acre-foot included in *Table B-17* and the delivery quantities for each contractor from each reach as indicated in *Table B-5A* and *Table B-5A-Adj*, plus any costs for extra peaking service. Those estimated components, subsequently adjusted for prior overpayments or underpayments, are included in *Table F* of the respective water supply contracts.

*Table B-19* summarizes the annual Transportation Charges for each contractor (the sum of the corresponding amounts included in *Tables B-15, B-16A, B-16B, and B-18*). Those estimated payments, subsequently adjusted for prior overpayments or underpayments, are set forth in *Table G* of the respective water supply contracts.

In accordance with provisions of the Devil Canyon-Castaic contract, *Table B-19* and *Table G* include amounts of debt service and operating cost payments due from the six contractors located down-aqueduct from Devil Canyon and Castaic powerplants.

## Delta Water Charges

*Table B-20A* presents the calculation of the Delta Water Rate for the initial Conservation Facilities applicable in 2015 in accordance with the amended Article 22(e) and 22(g) of all 29 water supply contracts. The Delta Water Rate was calculated at a Project Interest Rate of 4.610 percent, based on



Conservation Facility costs shown in Table B-13. That Delta Water Rate is used to compute projected Delta Water Charges under Article 53(i) for the contractors who have executed the Monterey Amendment. Included in Table B-20A is the Delta Water Rate for the two contractors who have not executed the Monterey Amendment: Plumas County Flood Control and Water Conservation District and Empire West Side Irrigation District.

*Table B-20B* shows each component of the 2015 Delta Water Rate from Table B-20A.

*Table B-21* summarizes the annual Delta Water Charge for each contractor. The projected charges in Table B-21 are developed by multiplying the total rate per acre-foot, as shown in Table B-20A, by the amount of allocated water for each contractor, as shown in Table B-4.

The projected Delta Water Charges from 2015-2035 include the following assumptions:

- (1) Escalation of projected operating costs at 4.5 percent per year for 2015 and 2016.
- (2) Escalation of projected operating costs at 1.0 percent per year for 2017-2035.

## Water System Revenue Bond Surcharge

*Table B-22* summarizes the Water System Revenue Bond (WSRB) Surcharge to the Delta Water Charge and the transportation capital cost component for each contractor. The surcharge shown in Table B-22 includes the financing costs of the WSRB Surcharge, Series B through Series AE. This surcharge is levied according to an amendment to the water supply contracts, which was signed by all of the water supply contractors.

## Total Water Charges

*Table B-23* summarizes the total annual charges to each contractor (the sum of the Transportation Charge in Table B-19, the Delta Water Charge in Table B-21, and the WSRB Surcharge in Table B-22). The charges do not reflect past payments by contractors and are unadjusted for prior overpayments or underpayments.

## Equivalent Total Water Charges

*Table B-24* presents the Transportation Charge and Delta Water Charge in terms of the equivalent unit charge for each acre-foot of allocated water now projected for delivery to the respective contractors.

These equivalent charges would provide the same principal sum at the end of the project repayment period as annual payments to be made as part of the Delta Water Charge and Transportation Charge, plus interest at the Project Interest Rate, if applied to each acre-foot of allocated water delivered to date; all surplus water delivered prior to May 1, 1973; all Article 21 water deliveries in 1994 and thereafter; and all allocated water now projected to be delivered during the remainder of the project repayment period (Table B-5B).

The equivalent unit Delta Water Charges included in Table B-24 are greater than those presented in Table B-20A because current projections of allocated water service are less for most contractors than the amounts shown in Table A.

## Equivalent Water Costs by Reach

*Table B-25* presents a summary of the equivalent unit transportation cost of conveying allocated water through respective aqueduct reaches of the Project Transportation Facilities.

Those unit costs provide the basis of charges assessed for extra service (such



**Table 8 Extra Peaking Charges for Additional Power, by Pumping Plant (in dollars)**

Year	Las Perillas and Badger Hill													Total	
	Cordelia Napa	Cordelia Solano	Barker Slough	South Bay	Banks	Dos Amigos	Badger Hill	Buena Vista	Teerink	Chrisman	Edmonston	Pearblossom	Oso		
1972	0	0	0	0	0	10,579	24,700	0	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	6,016	0	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	7,140	0	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	494	6,397	0	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	1,981	0	0	0	0	0	0	0	1,981
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	45,145	3,680	0	0	0	0	0	0	0	48,825
1979	0	0	0	0	0	0	3,306	0	0	0	0	0	0	0	3,306
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	12,126	0	0	0	0	0	0	0	0	12,126
1982	0	0	0	0	0	89,339	0	0	0	0	0	0	0	0	89,339
1983	0	0	0	35	7,594	3,534	152	0	0	0	0	0	0	0	11,315
1984	0	0	0	2,096	84,396	38,607	7,203	11,173	3,823	3,593	0	0	0	0	150,891
1985	0	0	0	1,480	19,612	8,841	763	4,488	4,412	8,929	28,353	0	0	0	76,878
1986	0	0	0	0	1,864	863	0	291	354	766	2,683	0	0	0	6,821
1987	0	0	0	604	17,129	7,838	835	2,295	1,806	3,460	11,058	0	0	0	45,025
1988	639	39	287	894	43,475	20,082	2,213	5,792	4,367	8,272	25,886	0	0	0	111,946
1989	2,491	566	1,483	70	40,251	18,642	1,935	3,401	1,531	2,058	3,793	0	0	0	76,221
1990	45	0	18	343	19,524	9,044	0	150	145	314	643	0	0	0	30,226
1991	903	0	281	0	21	8	0	15	17	39	139	41	0	0	1,464
1992	208	117	203	0	7,070	2,502	0	182	190	435	0	0	0	0	10,907
1993	0	681	889	4,483	123,080	54,741	0	8,898	5,458	10,900	35,068	11,139	0	0	255,337
1994	0	366	393	679	6,566	2,795	454	1,083	155	357	1,121	0	132	0	14,101
1995	0	0	0	1,717	24,464	9,422	27	1,865	3,475	782	1,104	400	0	0	43,256
1996	4	0	1	1,983	10,031	4,976	0	391	432	1,015	3,404	1,160	0	0	23,397
1997	0	1,780	2,152	3,107	337,357	165,774	1,753	34,604	12,296	15,910	21,028	0	0	0	595,761
1998	0	0	0	20,966	235,693	106,251	2,354	697	848	1,836	6,426	0	0	0	375,071
1999	0	0	0	0	63,196	26,235	0	3,394	4,136	8,959	31,350	7,740	0	0	145,010
2000-2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>4,290</b>	<b>3,549</b>	<b>5,707</b>	<b>38,457</b>	<b>1,041,323</b>	<b>637,838</b>	<b>70,909</b>	<b>78,719</b>	<b>43,445</b>	<b>67,625</b>	<b>172,056</b>	<b>20,480</b>	<b>132</b>	<b>0</b>	<b>2,184,530</b>

**Table 9 Extra Peaking Charges for Additional Power, by Contractor (in dollars)**

Year	Napa	Solano	Alameda- Zone 7	Alameda- County	Santa Clara	Dudley Ridge	Empire	Kern	Kings	Oak Flat	Tulare	AVEK	Castaic Lake	Coachella	Desert	Littlerock	Palmdale	San Gabriel	Total
1972	0	0	0	0	0	0	0	35,269	0	0	10	0	0	0	0	0	0	0	35,27
1973	0	0	0	0	0	0	0	6,016	0	0	0	0	0	0	0	0	0	0	6,01
1974	0	0	0	0	0	0	0	7,140	0	0	0	0	0	0	0	0	0	0	7,14
1975	0	0	0	0	0	0	0	6,891	0	0	0	0	0	0	0	0	0	0	6,89
1976	0	0	0	0	0	0	0	1,981	0	0	0	0	0	0	0	0	0	0	1,98
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	2,035	0	44,484	42	0	0	2,264	0	0	0	0	0	0	48,82
1979	0	0	0	0	0	0	0	2,821	0	0	0	0	485	0	0	0	0	0	3,30
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	11,951	0	0	0	0	0	0	0	175	0	0	12,12
1982	0	0	0	0	0	2,173	0	80,945	0	0	0	4,671	1,128	0	0	0	0	422	89,33
1983	0	0	0	0	48	9,511	0	0	1,365	0	0	0	391	0	0	0	0	0	11,31
1984	0	0	0	0	2,874	0	0	144,021	281	809	0	0	2,906	0	0	0	0	0	150,89
1985	0	0	0	2,029	0	0	64	25,664	0	98	0	48,767	256	0	0	0	0	0	76,87
1986	0	0	0	0	0	0	0	0	0	13	2,194	4,614	0	0	0	0	0	0	6,82
1987	0	0	229	0	599	313	84	24,141	0	95	0	18,207	545	0	0	812	0	0	45,02
1988	892	73	665	561	0	1,853	1,404	58,905	0	72	2,368	44,526	627	0	0	0	0	0	111,94
1989	3,478	1,062	96	0	0	13	403	55,085	0	239	8,278	0	1,043	0	0	1,035	5,489	0	76,22
1990	63	0	470	0	0	0	0	28,587	0	0	0	0	0	0	0	81	1,025	0	30,22
1991	1,184	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	0	1,46
1992	271	257	0	0	0	0	49	10,109	221	0	0	0	0	0	0	0	0	0	10,90
1993	0	1,570	6,122	0	0	0	3,757	97,812	504	0	74,577	0	0	24,983	41,156	0	4,856	0	255,33
1994	0	759	896	0	0	0	7	9,933	0	0	0	0	2,450	0	0	56	0	0	14,10
1995	0	0	2,353	0	0	10,197	0	28,085	310	0	0	0	27	0	0	0	2,284	0	43,25
1996	5	0	81	2,612	0	334	205	4,552	969	0	7,809	0	0	0	0	0	3,598	3,232	23,39
1997	0	3,932	3,999	0	0	6,190	0	546,733	0	40	0	0	0	0	0	0	34,867	0	595,76
1998	0	0	19,666	8,442	0	22,631	1	312,626	0	651	0	0	0	0	0	0	11,054	0	375,07
1999	0	0	0	0	0	0	0	76,425	0	0	6,922	0	0	0	0	0	11,576	50,087	145,01
2000- 2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>5,893</b>	<b>7,653</b>	<b>34,577</b>	<b>13,644</b>	<b>3,521</b>	<b>55,250</b>	<b>5,974</b>	<b>1,620,176</b>	<b>3,692</b>	<b>2,017</b>	<b>102,158</b>	<b>123,049</b>	<b>9,858</b>	<b>24,983</b>	<b>41,156</b>	<b>2,439</b>	<b>74,749</b>	<b>53,741</b>	<b>2,184,53</b>

as delivery of allocations down-aqueduct from a contractor's turnout) and for wheeling service to entities other than the SWP contractors.

The cumulative unit conveyance costs indicated for reaches in Table B-25 do not necessarily equal the equivalent unit Transportation Charges to contractors served from such reaches. The unit charges in Table B-24 account for the rate of water demand buildup and cost allocation factors of the individual contractors; however, the unit costs included in Table B-25 reflect the effect of melding the respective buildups and allocation criteria of all contractors whose allocations are conveyed through a given reach. Table B-25 also includes surplus water delivered prior to May 1, 1973, and Article 21 water deliveries in 1994 and thereafter.

### East Branch Enlargement Charges

*Table B-26* reflects DWR's projection of annual capital costs of the East Branch Enlargement for each aqueduct reach. These projections will be redetermined in future bulletins to include the following:

- a reallocation of costs of constructing the present East Branch facilities between Alamo Powerplant and Silverwood Lake;
- a reallocation of costs of Silverwood Lake to reflect additional use as a result of East Branch Enlargement operation;
- a reallocation of costs of San Bernardino Tunnel to reflect redistribution of flow capacities necessary for the East Branch Enlargement facilities; and
- actual enlargement construction costs.

These costs will be recovered with interest from the seven Southern California SWP contractors participating in the enlargement, in accordance with their amended water supply contracts (see *Table 10*).

*Table B-27* lists the projected minimum OMP&R costs for each reach of the

enlargement to be repaid by the seven East Branch Enlargement participating contractors. Currently, this table includes only minimum OMP&R costs attributable to the East Branch Enlargement. In accordance with Article 49(e)(1), the contractors participating in the East Branch Enlargement will also share in the remaining minimum OMP&R costs of the affected reaches, in accordance with a formula developed by DWR in consultation with the affected contractors.

*Table B-28* shows each participating contractor's share of the estimated capital costs of the East Branch Enlargement shown in Table B-26.

*Table B-29* shows the amounts of the annual capital cost components of the East Branch Enlargement Transportation Charge for each participating contractor. This component consists of each contractor's allocated share of debt service on bonds sold to finance the enlargement.

*Table B-30* shows the minimum OMP&R components of the East Branch Enlargement Transportation Charge for each participating contractor for each year of the project repayment period. The amounts shown in Table B-30 will recover the minimum OMP&R costs shown in Table B-27.

*Table B-31* shows the annual East Branch Enlargement Transportation charges for each participating contractor (the sum of the corresponding amounts included in Tables B-29 and B-30).

### East Branch Extension Phase I Charges

The East Branch Extension Phase I charges recover associated costs for East Branch Extension facilities beginning at Devil Canyon Powerplant Afterbay and extending to the terminus at Noble Creek in the vicinity of Beaumont, Riverside County. These costs

**Table 10 Determination of Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities among Participating Contractors**

Reach Number	Description
18A	Junction, West Branch, California Aqueduct, through Alamo Powerplant
19	Alamo Powerplant to Fairmont
20A	Fairmont through 70th Street West
20B	70th Street West to Palmdale
21	Palmdale to Littlerock Creek
22A	Littlerock Creek to Pearblossom Pumping Plant
22B	Pearblossom Pumping Plant to West Fork Mojave River
23B	West Fork Mojave River to Silverwood Lake (excluding Mojave Siphon Powerplant)
23C	Mojave Siphon Powerplant
24	Cedar Springs Dam and Silverwood Lake
25	Silverwood Lake to South Portal, San Bernardino Tunnel
26A	South Portal, San Bernardino Tunnel through Devil Canyon Powerplant
26B	Devil Canyon Powerplant Bypass

Share of Enlargement Capacity (cubic feet per second)

Reach Number	AVEK	Coachella	Desert	Mojave	Palmdale	San Bernardino	Metropolitan	Total
18A		151	13	136	6		1,200	1,506
19		151	13	136	6		1,200	1,506
20A	35	151	13	136	6		1,200	1,541
20B	35	151	13	136	6		1,200	1,541
21	35	151	13	136			1,200	1,535
22A	35	151	13	136			1,200	1,535
22B		151	13	136			1,200	1,500
23B		184	67	212			1,200	1,663
23C		184	67				1,200	1,451
24		190	78				1,200	1,468
25		193	83			63	1,200	1,539
26A		193	83			63	1,200	1,539
26B							300	300

Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities (flow ratios)

Reach Number	AVEK	Coachella	Desert	Mojave	Palmdale	San Bernardino	Metropolitan	Total
18A	0.00000000	0.10026560	0.00863214	0.09030544	0.00398406	0.00000000	0.79681276	1.00000000
19	0.00000000	0.10026560	0.00863214	0.09030544	0.00398406	0.00000000	0.79681276	1.00000000
20A	0.02271252	0.09798832	0.00843608	0.08825438	0.00389358	0.00000000	0.77871512	1.00000000
20B	0.02271252	0.09798832	0.00843608	0.08825438	0.00389358	0.00000000	0.77871512	1.00000000
21	0.02280130	0.09837134	0.00846906	0.08859935	0.00000000	0.00000000	0.78175895	1.00000000
22A	0.02280130	0.09837134	0.00846906	0.08859935	0.00000000	0.00000000	0.78175895	1.00000000
22B	0.00000000	0.10066667	0.00866667	0.09066667	0.00000000	0.00000000	0.79999999	1.00000000
23B	0.00000000	0.11064342	0.04028863	0.12748046	0.00000000	0.00000000	0.72158749	1.00000000
23C	0.00000000	0.12680910	0.04617505	0.00000000	0.00000000	0.00000000	0.82701585	1.00000000
24	0.00000000	0.12942779	0.05313351	0.00000000	0.00000000	0.00000000	0.81743870	1.00000000
25	0.00000000	0.12540611	0.05393112	0.00000000	0.00000000	0.04093567	0.77972710	1.00000000
26A	0.00000000	0.12540611	0.05393112	0.00000000	0.00000000	0.04093567	0.77972710	1.00000000
26B	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	1.00000000	1.00000000

will be recovered from two contractors—San Bernardino and San Gorgonio—in accordance with their amended water supply contracts. The factors for distributing costs are shown in *Table 11*. *Table 12* shows the debt service for 2015.

## Short-Term Agreements

DWR and the water supply contractors execute short-term agreements that affect the contractors' charges.

## Municipal Water Quality Investigations

DWR executed a 5-year agreement in 1997 with 16 municipal and industrial

contractors, who agreed to pay for allocated shares of DWR's Municipal Water Quality Investigations costs. Additional amendments were executed in 2002, 2006, 2008, 2010, and 2014 to extend the program. The Municipal Water Quality Investigations charges under this agreement are included in the transportation minimum OMP&R components shown in Table B-16A.

## Feasibility Study

Nine contractors executed a short-term agreement (1997 and 1998) to participate in the feasibility study for the American Basin conjunctive-use program. Feasibility study costs are included in Table B-16A.

**Table 11 Factors for Distributing Capital and Minimum OMP&R Costs of the East Branch Extension Facilities**

Reach Number	Reach Description	San Bernardino	San Gorgonio	Total
<b>Capital</b>				
all	Average of the contractors' participation of EBX facilities	0.458417	0.541583	1.000000
<b>Minimum</b>				
1	Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road	0.557330	0.442670	1.000000
2A	Junction Foothill Pipeline near Cone Camp Road to Greenspot Pump Station	0.557330	0.442670	1.000000
2B	Greenspot Pump Station to Morton Canyon Valve Vault	0.777778	0.222222	1.000000
2C	Morton Canyon Valve Vault to Crafton Hills Pump Station	0.777778	0.222222	1.000000
3A	Crafton Hills Pump Station to Carter Street Valve Vault	0.557330	0.442670	1.000000
3B	Carter Street Valve Vault to Garden Air Creek, South of San Bernardino County Line	0.557330	0.442670	1.000000
4A	Garden Air Creek to Cherry Valley Pump Station		1.000000	1.000000
4B	Cherry Valley Pump Station to Terminus at Noble Creek		1.000000	1.000000

**Table 12 East Branch Extension Facilities Debt Service for 2015**

Contractor	Share of Participation (percent)	Total Debt Service Charge (in dollars)
San Bernardino	45.84170	<b>14,160,508</b>
San Gorgonio	54.15830	<b>16,729,507</b>
<b>Total</b>	100.00000	<b>30,890,015</b>



## Delta Programs

Contractors have agreed to participate in several Delta improvement programs that started in 2007 and that will possibly extend into the future.

The first agreement pertains to the Bay Delta Conservation Plan (BDCP) agreed to in the Memorandum of Agreement (MOA) for Supplemental Funding for Certain Ecosystem Actions and Support for Implementation of Near-Term Water Supply, Water Quality, Ecosystem, and Levee Actions. The BDCP comprises two elements: fishery costs and consultation costs. These costs were added to the contractors' transportation minimum component for bill years 2007 through 2012.

The second agreement pertains to the non-BDCP costs of the MOA, comprising the Delta Vision and pelagic organism decline research costs. These costs were added to the contractors' conservation minimum component for bill years 2007 and 2008.

The third set of agreements pertains to the Delta Habitat Conservation and Conveyance Program (DHCCP). The agreements are between DWR and 20 participating SWP contractors to provide 50 percent of the funding for the preliminary planning phase of an improved Delta water conveyance facility. (The remaining 50 percent is provided by the Bureau of Reclamation.) This program will assess potential habitat restoration and water conveyance options in the Delta. For bill years 2008 through 2011, nearly \$70 million in charges associated with the DHCCP were billed directly to the 20 participating SWP contractors as a separate line item in the Statements of Charges, and are not reflected in the tables in this appendix.

A fourth set of agreements pertains to both DHCCP and BDCP. For bill years 2012 and 2013, an Agreement for Supplemental Funding for the Costs of Environmental

Analysis, Planning and Design of Delta Conservation Measures, Including Delta Conveyance Options, was executed in 2012 between DWR and 16 participating SWP contractors to provide 50 percent of the project funding. In 2012, \$22 million was billed and in 2013, \$28 million was billed directly to the 16 participating contractors as a separate line item in the Statements of Charges.

During 2013, SWP water supply contractors agreed to participate in the 2013 San Joaquin River Flow Augmentation Program. The costs of the \$4 million program were recovered in the 2014 Statements of Charges.

**TABLE B-1 Factors for Distributing Reach Capital Costs among Contractors <sup>a</sup>**

Reach No.	Reach Description	NORTH BAY AREA		SOUTH BAY AREA				Total
		Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor South Bay	
<b>NORTH BAY AQUEDUCT</b>								
1	Barker Slough thru Fairfield/Vacaville Turnout	0.29667896	0.70332104					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.38414552	0.61585448					1.00000000
3A	Cordelia Forebay thru Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay thru Napa Turnout Reservoir	1.00000000						1.00000000
<b>SOUTH BAY AQUEDUCT</b>								
1	Bethany Reservoir thru Altamont Turnout			0.22599612	0.20663021	0.49237700	0.07499667	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.22599658	0.20663059	0.49237783	0.07499500	1.00000000
4	Patterson Reservoir to Del Valle Junction			0.19504795	0.21450017	0.51113249	0.07931939	1.00000000
5	Del Valle Junction thru Lake Del Valle			0.14436367	0.12972254	0.33715573	0.38875806	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.14599918	0.21144710	0.50574745	0.13680627	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout				0.25176680	0.60218448	0.14604872	1.00000000
8	Vallecitos Turnout thru Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout thru Santa Clara Terminal Facilities					1.00000000		1.00000000
<b>CALIFORNIA AQUEDUCT</b>								
1	Delta thru Bethany Reservoir			0.00954737	0.00872917	0.02080118	0.00342507	N/A

Reach No.	Reach Description	CENTRAL COASTAL AREA		SOUTHERN CALIFORNIA AREA				
		San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency
<b>CALIFORNIA AQUEDUCT</b>								
1	Delta thru Bethany Reservoir	0.00533010	0.00983337	0.02939084	0.01285827	0.00528315	0.00133612	0.00871300
2A	Bethany Reservoir to Orestimba Creek	0.00557213	0.01027988	0.03072531	0.01343201	0.00552068	0.00139620	0.00910474
2B	Orestimba Creek to O'Neill Forebay	0.00557824	0.01029119	0.03075915	0.01345351	0.00552831	0.00139814	0.00911733
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557719	0.01028923	0.03075332	0.01345294	0.00552772	0.00139798	0.00911637
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557607	0.01028717	0.03074719	0.01345233	0.00552710	0.00139784	0.00911536
5	Panoche Creek to Five Points	0.00557467	0.01028462	0.03073954	0.01345157	0.00552633	0.00139763	0.00911409
6	Five Points to Arroyo Pasajero	0.00557257	0.01028074	0.03072799	0.01345042	0.00552517	0.00139733	0.00911216
7	Arroyo Pasajero to Kettleman City	0.00557189	0.01027949	0.03072428	0.01345006	0.00552480	0.00139723	0.00911154
8C	Kettleman City thru Milham Avenue	0.00557103	0.01027792	0.03071961	0.01344960	0.00552432	0.00139712	0.00911076
8D	Milham Avenue thru Avenal Gap	0.00568611	0.01049020	0.01373548	0.01373353	0.00563986	0.00142632	0.00930130
9	Avenal Gap thru Twisselman Road			0.03426625	0.01356094	0.00616886	0.00156011	0.01017373
10A	Twisselman Road thru Lost Hills			0.03481391	0.01377767	0.00626946	0.00158556	0.01033963
11B	Lost Hills to 7th Standard Road			0.03835043	0.01517717	0.00691699	0.00174933	0.01140749
12D	7th Standard Road thru Elk Hills Road			0.04031661	0.01595523	0.00727790	0.00184059	0.01200265
12E	Elk Hills Road thru Tupman Road			0.04037074	0.01597665	0.00728878	0.00184332	0.01202059
13B	Tupman Road to Buena Vista Pumping Plant			0.04379882	0.01733322	0.00791595	0.00200194	0.01305492
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04599268	0.01820137	0.00831952	0.00210399	0.01372049
14B	Santiago Creek thru Old River Road			0.04682530	0.01853084	0.00847388	0.00214303	0.01397505
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04825217	0.01909545	0.00873768	0.00220973	0.01441013
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04905609	0.01941356	0.00888679	0.00224744	0.01465600
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05089794	0.02014241	0.00922722	0.00233351	0.01521742
17E	Edmonston Pumping Plant to Porter Tunnel			0.05329388	0.02109050	0.00967107	0.00244575	0.01594937
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05340725	0.02113537	0.00969176	0.00245098	0.01598349
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13238112		0.02399391	0.00606795	0.03957043
19	Alamo Powerplant to Fairmont			0.13237766		0.02399451	0.00606811	0.03957141
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06847931		0.02576425	0.00651573	0.04249001
20B	70th Street West to Palmdale			0.02276024		0.02702917	0.00683555	0.04457607
21	Palmdale to Littlerock Creek			0.02318952		0.02754716	0.00696651	0.04543034
22A	Littlerock Creek to Pearblossom Pumping Plant			0.01181870		0.02794143	0.00706621	0.04608043
22B	Pearblossom Pumping Plant to West Fork Mojave River					0.02827552	0.00715074	0.04663153
23	West Fork Mojave River to Silverwood Lake					0.00324449	0.00818122	0.00535117
24	Cedar Springs Dam and Silverwood Lake					0.01024605	0.01251569	0.01690478
25	Silverwood Lake to South Portal San Bernardino Tunnel							
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.							
28G	Devil Canyon Powerplant to Barton Road							
28H	Barton Road to Lake Perris							
28J	Perris Dam and Lake Perris							
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.				0.03544337			
29F	Oso Pumping Plant thru Quail Embankment				0.03544339			
29G	Quail Embankment thru Warne Powerplant				0.02817144			
29H	Pyramid Dam and Lake				0.03544338			
29J	Pyramid Lake thru Castaic Powerplant				0.02927284			
30	Castaic Dam and Lake							
31A	Avenal Gap to Devil's Den Pumping Plant	0.10560301	0.19482503		0.07364766			
33A	Devil's Den Pumping Plant through Tank 1	0.10101221	0.89898779					
33B	Tank 1 through Chorro Valley Turnout	0.09912818	0.90087182					
34	Chorro Valley Turnout through Lopez Turnout	0.05479573	0.94520427					
35	Lopez Turnout through Guadalupe Turnout		1.00000000					

(a) Proportionate Use Factors do not reflect permanent water transfers as a result of the Monterey Amendment and after.

**TABLE B-1 Factors for Distributing Reach Capital Costs among Contractors <sup>a</sup>**

Reach No.	SAN JOAQUIN VALLEY AREA							
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District
				Municipal and Industrial	Agricultural			
<b>CALIFORNIA AQUEDUCT</b>								
1	0.01707770	0.00088678	0.00254693	0.02741768	0.30629913	0.00090695	0.00167121	0.03504975
2A	0.01781031	0.00092482	0.00266258	0.02864263	0.31945188	0.00094747	0.00174288	0.03655331
2B	0.01785838	0.00092731	0.00266550	0.02868743	0.32030556	0.00094896		0.03665201
3	0.01786337	0.00092757	0.00266499	0.02868589	0.32039254	0.00094892		0.03666225
4	0.01786863	0.00092785	0.00266446	0.02868428	0.32048398	0.00094886		0.03667303
5	0.01787517	0.00092819	0.00266380	0.02868227	0.32059816	0.00094879		0.03668649
6	0.01788508	0.00092870	0.00266279	0.02867923	0.32077093	0.00094868		0.03670685
7	0.01788826	0.00092887	0.00266246	0.02867825	0.32082633	0.00094864		0.03671338
8C	0.01789228	0.00092909	0.00266205	0.02867702	0.32089625	0.00094859		0.03672162
8D	0.01828779		0.00271703	0.02928147	0.32798200			0.01820857
9								
10A				0.03204523	0.32739538			
11B				0.03257442	0.31658608			
12D				0.03597398	0.24684668			
12E				0.03787171	0.20804762			
13B				0.03793198	0.20695175			
14A				0.01458796	0.16600071			
14B				0.00620338	0.13319181			
14C				0.00632023	0.11741558			
15A				0.00651962	0.09039633			
16A				0.00663252	0.07516317			
17E				0.00688973	0.04028829			
31A			0.05046240		0.57546190			

Reach No.	SOUTHERN CALIFORNIA AREA (continued)								Total
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Geronimo Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	
<b>CALIFORNIA AQUEDUCT</b>									
1	0.00049180	0.01101147	0.00369131	0.02362857	0.00650354	0.00398392	0.43929350	0.00429212	1.00000000
2A	0.00051413	0.01151136	0.00385891	0.02469101	0.00679699	0.00416304	0.45921072	0.00448701	1.00000000
2B	0.00051469	0.01152409	0.00386317	0.02472511	0.00680570	0.00416880	0.45973548	0.00449194	1.00000000
3	0.00051461	0.01152193	0.00386244	0.02472246	0.00680478	0.00416835	0.45965407	0.00449108	1.00000000
4	0.00051451	0.01151965	0.00386167	0.02471968	0.00680380	0.00416787	0.45956848	0.00449019	1.00000000
5	0.00051440	0.01151681	0.00386070	0.02471620	0.00680259	0.00416730	0.45946161	0.00448907	1.00000000
6	0.00051419	0.01151251	0.00385926	0.02471095	0.00680076	0.00416640	0.45929991	0.00448738	1.00000000
7	0.00051413	0.01151113	0.00385879	0.02470927	0.00680016	0.00416612	0.45924807	0.00448685	1.00000000
8C	0.00051405	0.01150938	0.00385821	0.02470716	0.00679941	0.00416576	0.45918261	0.00448616	1.00000000
8D	0.00052466	0.01174718	0.00393793	0.02522383	0.00694100	0.00425288	0.46868533	0.00457883	1.00000000
9	0.00057339	0.01283841	0.00430367	0.02758959	0.00758975	0.00465175	0.51227887	0.00500407	1.00000000
10A	0.00058254	0.01304366	0.00437246	0.02803943	0.00771262	0.00472760	0.52049091	0.00508405	1.00000000
11B	0.00064171	0.01436906	0.00481665	0.03093503	0.00850448	0.00521581	0.57349473	0.00560046	1.00000000
12D	0.00067463	0.01510596	0.00506361	0.03254889	0.00894541	0.00548790	0.60297374	0.00588755	1.00000000
12E	0.00067553	0.01512626	0.00507040	0.03259749	0.00895830	0.00549608	0.60379667	0.00589546	1.00000000
13B	0.00073290	0.01641098	0.00550099	0.03540212	0.00972547	0.00596896	0.65516902	0.00639604	1.00000000
14A	0.00076961	0.01723325	0.00577656	0.03720681	0.01021819	0.00627322	0.68807273	0.00671639	1.00000000
14B	0.00078354	0.01754538	0.00588113	0.03789703	0.01040613	0.00638960	0.70057530	0.00683798	1.00000000
14C	0.00080743	0.01808019	0.00606036	0.03907670	0.01072763	0.00658850	0.72199174	0.00704634	1.00000000
15A	0.00082089	0.01838154	0.00616135	0.03974336	0.01090913	0.00670088	0.73406357	0.00716371	1.00000000
16A	0.00085171	0.01907194	0.00639271	0.04126559	0.01132404	0.00695754	0.76170731	0.00743264	1.00000000
17E	0.00089182	0.01997003	0.00669365	0.04325018	0.01186455	0.00729213	0.79767940	0.00778251	1.00000000
17F	0.00089372	0.02001251	0.00670788	0.04334270	0.01189988	0.00730773	0.79937767	0.00779906	1.00000000
18A	0.00221525	0.04960424	0.01662680	0.10730448	0.02944860	0.01809192	0.57469530		1.00000000
19	0.00221522	0.04960300	0.01662640	0.10730707	0.02944876	0.01809230	0.57469556		1.00000000
19C									1.00000000
20A	0.00237800	0.05324853	0.01784830	0.11522152	0.03161798	0.01942666	0.61700971		1.00000000
20B	0.00249470	0.05586076	0.01872390	0.12087843	0.03316986	0.02038045	0.64729087		1.00000000
21	0.00254199	0.05692053		0.12319480	0.03380324	0.02077093	0.65963498		1.00000000
22A		0.05773082		0.12495766	0.03428605	0.02106816	0.66905054		1.00000000
22B		0.05842136		0.12645207	0.03469614	0.02132008	0.67705256		1.00000000
23				0.14467451	0.03969010	0.02439237	0.77446614		1.00000000
24				0.22243002	0.04339444	0.02843498	0.66607404		1.00000000
25				0.14947726	0.03997502	0.02520426	0.78534346		1.00000000
26A				0.14947726	0.03997502	0.02520426	0.78534346		1.00000000
28G				0.05126137			0.94873863		1.00000000
28H							1.00000000		1.00000000
28J							1.00000000		1.00000000
29A							0.95147783	0.01307880	1.00000000
29F							0.95147785	0.01307876	1.00000000
29G							0.95147785	0.01307876	1.00000000
29H							0.96278381	0.00904475	1.00000000
29J							0.95147787	0.01307875	1.00000000
30							0.96212388	0.00860328	1.00000000
31A									1.00000000
33A									1.00000000
34									1.00000000
35									1.00000000

(a) Proportionate Use Factors do not reflect permanent water transfers as a result of the Monterey Amendment and after.

**TABLE B-2 Factors for Distributing Reach Minimum OMP&R Costs Among Contractors <sup>a</sup>**

Reach No.	Reach Description	NORTH BAY AREA		SOUTH BAY AREA				Total
		Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Future Contractor South Bay	
<b>NORTH BAY AQUEDUCT</b>								
1	Barker Slough thru Fairfield/Vacaville Turnout	0.29251728	0.70748272					1.00000000
2	Fairfield/Vacaville Turnout to Cordelia Forebay	0.42000793	0.57999207					1.00000000
3A	Cordelia Forebay thru Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay thru Napa Turnout Reservoir	1.00000000						1.00000000
<b>SOUTH BAY AQUEDUCT</b>								
1	Bethany Reservoir thru Altamont Turnout			0.33980110	0.19515838	0.46504052	0.00000000	1.00000000
2	Altamont Turnout thru Patterson Reservoir			0.33978741	0.19516252	0.46505007	0.00000000	1.00000000
4	Patterson Reservoir to Del Valle Junction			0.31610985	0.20216089	0.48172926	0.00000000	1.00000000
5	Del Valle Junction thru Lake Del Valle			0.53312173	0.12972254	0.33715573	0.00000000	1.00000000
6	Del Valle Junction thru South Livermore Turnout			0.32478705	0.19906896	0.47614399	0.00000000	1.00000000
7	South Livermore Turnout thru Vallecitos Turnout			0.14604872	0.25176680	0.60218448	0.00000000	1.00000000
8	Vallecitos Turnout thru Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout thru Santa Clara Terminal Facilities					1.00000000		1.00000000
<b>CALIFORNIA AQUEDUCT</b>								
1	Delta thru Bethany Reservoir				0.00870518	0.02074403		N/A

Reach No.	Reach Description	CENTRAL COASTAL AREA		SOUTHERN CALIFORNIA AREA				
		San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency
<b>CALIFORNIA AQUEDUCT</b>								
1	Delta thru Bethany Reservoir	0.00531721	0.00980965	0.03130358	0.02543338	0.03261213	0.00133220	0.01285646
2A	Bethany Reservoir to Orestimba Creek	0.00556969	0.01027545	0.03278434	0.02659653	0.03414259	0.00139484	0.01346045
2B	Orestimba Creek to O'Neill Forebay	0.00557578	0.01028673	0.03282389	0.02665383	0.03419149	0.00139677	0.01347932
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557472	0.01028476	0.03281870	0.02665705	0.03418834	0.00139663	0.01347795
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557360	0.01028270	0.03281323	0.02666041	0.03418504	0.00139648	0.01347652
5	Panoche Creek to Five Points	0.00557222	0.01028014	0.03280640	0.02666463	0.03418091	0.00139630	0.01347474
6	Five Points to Arroyo Pasajero	0.00557012	0.01027626	0.03279609	0.02667100	0.03417466	0.00139599	0.01347205
7	Arroyo Pasajero to Kettleman City	0.00556944	0.01027501	0.03279278	0.02667304	0.03417265	0.00139589	0.01347118
8C	Kettleman City thru Milham Avenue	0.00551362	0.01017203	0.03245613	0.02634257	0.03380450	0.00138102	0.01332696
8D	Milham Avenue thru Avenal Gap	0.00562578	0.01037893	0.03311929	0.02690184	0.03450165	0.00140943	0.01360147
9	Avenal Gap thru Twisselman Road			0.03490917	0.02761987	0.03509927	0.00151717	0.01432230
10A	Twisselman Road thru Lost Hills			0.03544917	0.02807208	0.03564408	0.00154110	0.01454684
11B	Lost Hills to 7th Standard Road			0.03880671	0.03085710	0.03902944	0.00168938	0.01593968
12D	7th Standard Road thru Elk Hills Road			0.04066779	0.03241328	0.04090687	0.00177180	0.01671325
12E	Elk Hills Road thru Tupman Road			0.04071899	0.03246787	0.04095940	0.00177429	0.01673594
13B	Tupman Road to Buena Vista Pumping Plant			0.04402054	0.03519674	0.04428760	0.00191991	0.01810442
14A	Buena Vista Pumping Plant thru Santiago Creek			0.04611560	0.03675967	0.04640153	0.00201279	0.01897599
14B	Santiago Creek thru Old River Road			0.04676624	0.03303687	0.04706094	0.00204236	0.01925135
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04794869	0.03181987	0.04825630	0.00209534	0.01974685
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04864100	0.03227919	0.04895597	0.00212631	0.02003668
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05024161	0.03334119	0.05057226	0.00219758	0.02070455
17E	Edmonston Pumping Plant to Porter Tunnel			0.05223186	0.03466168	0.05258256	0.00228636	0.02153594
17F	Porter Tunnel to Junction, West Branch, Calif. Aqueduct			0.05233552	0.03473046	0.05268698	0.00229092	0.02157880
18A	Junction, West Branch, Calif. Aqueduct thru Alamo Pwp.			0.13774725		0.11306511	0.00603056	0.05137695
19	Alamo Powerplant to Fairmont			0.13774370		0.11306344	0.00603069	0.05137766
19C	Buttes Junction thru Buttes Reservoir			1.00000000				
20A	Fairmont thru 70th Street West			0.06855702		0.12212506	0.00651522	0.05550243
20B	70th Street West to Palmdale			0.02284441		0.12811683	0.00683511	0.05822670
21	Palmdale to Litterock Creek			0.02327543		0.13055246	0.00696606	0.05933989
22A	Litterock Creek to Pearblossom Pumping Plant			0.01190663		0.13241285	0.00706574	0.06018798
22B	Pearblossom Pumping Plant to West Fork Mojave River			0.00195128		0.13374659	0.00713697	0.06079440
23	West Fork Mojave River to Silverwood Lake					0.12416451	0.00818135	0.02168414
24	Cedar Springs Dam and Silverwood Lake					0.02651510	0.01251569	0.01910229
25	Silverwood Lake to South Portal San Bernardino Tunnel					0.09751351		0.01317145
26A	South Portal, San Bernardino Tunnel thru Devil Canyon Pwp.					0.12013473		0.01622697
28G	Devil Canyon Powerplant to Barton Road					0.30672992		0.04143095
28H	Barton Road to Lake Perris					0.32330286		0.04366951
28J	Perris Dam and Lake Perris					0.32330202		0.04366970
29A	Junction, West Branch, Calif. Aqueduct thru Oso P. P.			0.00296720	0.05726734			
29F	Oso Pumping Plant thru Quail Embankment			0.00296796	0.05726649			
29G	Quail Embankment thru Warne Powerplant				0.05742327			
29H	Pyramid Dam and Lake				0.03349572			
29J	Pyramid Lake thru Castaic Powerplant				0.05740996			
30	Castaic Dam and Lake				0.03248607			
31A	Avenal Gap to Devil's Den Pumping Plant	0.10542164	0.19449108			0.07351496	0.05400251	0.01800084
33A	Devil's Den Pumping Plant thru Tank 1	0.10101221	0.89898779					
33B	Tank 1 thru Chorro Valley Turnout	0.10101221	0.89898779					
34	Chorro Valley Turnout through Lopez Turnout	0.05271277	0.94728723					
35	Lopez Turnout thru Guadalupe Turnout		1.00000000					

(a) Proportionate use factors apply to 2015, and reflect permanent capacity water transfers that have been signed as of February 1, 2014

**TABLE B-2 Factors for Distributing Reach Minimum OMP&R Costs Among Contractors <sup>a</sup>**

Reach No.	SAN JOAQUIN VALLEY AREA										
	Napa County FC&WCD	Solano County WA	Alameda County FC&WCD, Zone 7	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District
							Municipal and Industrial	Agricultural			
CALIFORNIA AQUEDUCT											
1	0.00101482	0.00145895	0.02319903	0.01467673	0.00088461	0.00254076	0.02734568	0.27096833	0.00247145	0.00166714	0.02580275
2A	0.00106145	0.00152591	0.00868253	0.01533481	0.00092428	0.00266141	0.02862314	0.28310687	0.00258398	0.00174185	0.02695973
2B	0.00106360	0.00152905	0.00869823	0.01537617	0.00092676	0.00266432	0.02866783	0.28387747	0.00258988		0.02703241
3	0.00106370	0.00152920	0.00869838	0.01538045	0.00092702	0.00266381	0.02866629	0.28395878	0.00259028		0.02703994
4	0.00106379	0.00152934	0.00869854	0.01538495	0.00092729	0.00266328	0.02866467	0.28404425	0.00259071		0.02704786
5	0.00106390	0.00152952	0.00869876	0.01539058	0.00092763	0.00266262	0.02866263	0.28415100	0.00259125		0.02705775
6	0.00106409	0.00152980	0.00869909	0.01539909	0.00092815	0.00266161	0.02866596	0.28431251	0.00259206		0.02707272
7	0.00106415	0.00152990	0.00869920	0.01540183	0.00092832	0.00266127	0.02866587	0.28436430	0.00259232		0.02707752
8C	0.00105126	0.00151129	0.00859813	0.01519240	0.00091570	0.00263462	0.02834154	0.28048179	0.00255949		0.02679939
8D	0.00107347	0.00154326	0.00877817	0.01552187		0.00268820	0.02892910	0.28657021	0.00165698		0.00825002
9	0.00079148	0.00109219	0.00779740				0.03115978	0.29020213			
10A	0.00080441	0.00110983	0.00792269				0.03165722	0.27906723			
11B	0.00064433	0.00094350	0.00351417				0.03473359	0.21569759			
12D							0.03644652	0.18305822			
12E							0.03650093	0.18194750			
13B							0.01398402	0.14058058			
14A							0.00593078	0.10814827			
14B							0.00602009	0.09952426			
14C							0.00617876	0.07848396			
15A							0.00627144	0.06500426			
16A							0.00648410	0.03392037			
17E							0.00198506				
31A	0.00628695	0.00977801	0.02617705			0.05037550		0.36716813	0.00176551		

Reach No.	SOUTHERN CALIFORNIA AREA (continued)									Total
	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Municipal Water District	San Gabriel Valley Municipal Water District	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District		
CALIFORNIA AQUEDUCT										
1	0.00049038	0.02116470	0.00458381	0.02355980	0.00648455	0.00397230	0.41532271	0.00427768		1.00000000
2A	0.00051367	0.02214484	0.00480091	0.02466751	0.00679050	0.00415906	0.43501287	0.00448079		1.00000000
2B	0.00051423	0.02218483	0.00480654	0.02470151	0.00679919	0.00416478	0.43550968	0.00448571		1.00000000
3	0.00051414	0.02218522	0.00480573	0.02469885	0.00679827	0.00416433	0.43543260	0.00448486		1.00000000
4	0.00051405	0.02218564	0.00480489	0.02469606	0.00679730	0.00416387	0.43535156	0.00448397		1.00000000
5	0.00051393	0.02218616	0.00480382	0.02469256	0.00679607	0.00416328	0.43525035	0.00448285		1.00000000
6	0.00051372	0.02218693	0.00480221	0.02468729	0.00679422	0.00416240	0.43509723	0.00448115		1.00000000
7	0.00051366	0.02218719	0.00480171	0.02468559	0.00679362	0.00416212	0.43504813	0.00448061		1.00000000
8C	0.00050851	0.02192962	0.00475278	0.02442260	0.00672277	0.00411777	0.44211780	0.00443571		1.00000000
8D	0.00051885	0.02238875	0.00484976	0.02492516	0.00686055	0.00420251	0.45117880	0.00452595		1.00000000
9	0.00055796	0.02061192	0.00521674	0.02683029	0.00738240	0.00452372	0.48549902	0.00486719		1.00000000
10A	0.00056659	0.02092935	0.00529783	0.02725335	0.00749802	0.00459505	0.49310270	0.00494246		1.00000000
11B	0.00062024	0.02290463	0.00580164	0.02987521	0.00821533	0.00503710	0.54027985	0.00541051		1.00000000
12D	0.00064998	0.02399884	0.00599767	0.03133251	0.00861365	0.00528280	0.56647688	0.00566994		1.00000000
12E	0.00065079	0.02402828	0.00600523	0.03137638	0.00862529	0.00529020	0.56724183	0.00567708		1.00000000
13B	0.00070354	0.02597118	0.00649222	0.03395142	0.00933012	0.00572435	0.61359604	0.00613732		1.00000000
14A	0.00073704	0.02720257	0.00680126	0.03559402	0.00977890	0.00600130	0.64311092	0.00642936		1.00000000
14B	0.00074743	0.02758281	0.00689726	0.03611670	0.00992049	0.00608943	0.65242374	0.00652003		1.00000000
14C	0.00076634	0.02827615	0.00707171	0.03705347	0.01017549	0.00624735	0.66919487	0.00668485		1.00000000
15A	0.00077741	0.02868221	0.00717384	0.03760115	0.01032464	0.00633968	0.67900489	0.00678133		1.00000000
16A	0.00080298	0.02962205	0.00740997	0.03886148	0.01066844	0.00655218	0.70161679	0.00700445		1.00000000
17E	0.00083480	0.03079028	0.00770356	0.04043105	0.01109636	0.00681681	0.72976182	0.00728186		1.00000000
17F	0.00083646	0.03085132	0.00771884	0.04051162	0.01111844	0.00683040	0.73121394	0.00729630		1.00000000
18A	0.00220155	0.04929713	0.01652427	0.10664131	0.02926634	0.01798005	0.46986948			1.00000000
19	0.00220151	0.04929585	0.01652388	0.10664396	0.02926656	0.01798044	0.46987231			1.00000000
19C										1.00000000
20A	0.00237787	0.05324421	0.01784728	0.11521174	0.03161525	0.01942494	0.50757898			1.00000000
20B	0.00249455	0.05585607	0.01872278	0.12086783	0.03316690	0.02037859	0.53249023			1.00000000
21	0.00254183	0.05691567		0.12318381	0.03380017	0.02076901	0.54265567			1.00000000
22A		0.05772584		0.12494639	0.03428290	0.02106619	0.55040548			1.00000000
22B		0.05830722		0.12620561	0.03462835	0.02127845	0.55595113			1.00000000
23				0.14467451	0.03969010	0.02439237	0.63721302			1.00000000
24				0.22243002	0.04339445	0.02843498	0.64760747			1.00000000
25				0.11825184	0.03722720	0.01993915	0.71389685			1.00000000
26A				0.14947726	0.03997501	0.02520426	0.64898177			1.00000000
28G				0.05126136			0.60057777			1.00000000
28H							0.63302763			1.00000000
28J							0.63302828			1.00000000
29A							0.92702291	0.01274255		1.00000000
29F							0.92702302	0.01274253		1.00000000
29G							0.92979606	0.01278067		1.00000000
29H							0.95753173	0.00897255		1.00000000
29J							0.92980918	0.01278086		1.00000000
30							0.95895422	0.00855971		1.00000000
31A		0.09301782								1.00000000
33A										1.00000000
33B										1.00000000
34										1.00000000
35										1.00000000

(a) Proportionate use factors apply to 2015, and reflect permanent capacity water transfers that have been signed as of February 1, 2014



**TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant <sup>a</sup>**

(in dollars)

Sheet 1 of 3

Calendar Year	NORTH BAY AQUEDUCT			SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT			
	Reach 1	Reach 3A	Reach 3B	Reach 1 (c)	Reach 1	Reach 4	Reach 14A	Reach 15A
	Barker Slough Pumping P.	Cordelia Pumping P. Solano	Cordelia Pumping P. Napa (b)	South Bay & Del Valle Pumping P.	Banks Pumping P.	Dos Amigos Pumping P.	Buena Vista Pumping P.	Teerink Pumping P.
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	36,771	0	0	0	0
1963	0	0	0	55,654	0	0	0	0
1964	0	0	0	73,240	0	0	0	0
1965	0	0	0	137,665	0	0	0	0
1966	0	0	0	186,064	0	0	0	0
1967	0	0	0	216,515	15,453	0	0	0
1968	0	0	6,989	336,671	452,630	202,947	0	0
1969	0	8,551	8,551	257,579	293,741	135,425	0	0
1970	0	0	13,598	396,358	346,215	211,197	1	0
1971	0	0	10,609	381,662	574,015	225,188	115,801	2,564
1972	0	0	14,434	598,702	933,292	492,633	198,914	68,304
1973	0	0	14,449	493,490	688,030	381,232	263,468	236,623
1974	0	0	17,473	565,575	783,562	447,772	315,939	324,966
1975	0	0	14,779	349,758	1,341,019	518,322	508,060	552,952
1976	0	0	20,856	571,361	1,638,453	641,115	712,947	713,875
1977	0	0	22,635	512,996	1,013,307	277,439	265,169	300,985
1978	0	0	21,692	586,355	2,339,502	560,759	689,236	616,104
1979	0	0	16,237	605,136	3,554,256	1,008,564	776,016	749,188
1980	0	0	19,945	523,369	2,083,336	1,129,152	1,051,629	1,047,495
1981	0	0	23,842	567,692	3,952,931	1,939,189	1,336,867	1,319,739
1982	0	0	12,157	605,780	3,082,031	1,363,705	1,200,226	1,213,660
1983	0	0	2,342	82,222	1,001,612	396,086	450,801	432,165
1984	0	0	4,822	271,543	1,856,959	976,773	823,681	770,618
1985	0	0	10,188	451,020	3,186,029	1,621,418	1,409,980	1,411,621
1986	0	0	15,501	807,984	6,601,752	2,627,407	2,405,224	2,432,322
1987	0	0	27,223	886,956	5,820,699	2,555,341	2,295,575	2,286,066
1988	17,813	0	24,020	909,300	6,365,669	2,648,986	2,628,985	2,636,224
1989	29,819	43,846	26,519	1,161,160	9,964,956	4,002,409	4,130,033	4,159,440
1990	52,210	67,109	40,775	1,834,626	10,554,762	4,541,508	5,855,196	6,099,412
1991	10,429	10,118	5,252	378,966	1,994,449	510,781	944,445	1,077,662
1992	13,319	13,070	9,406	311,251	3,385,375	1,235,571	1,366,433	1,441,966
1993	(11,941)	(8,753)	(5,392)	(158,214)	537,591	348,409	(127,617)	(104,923)
1994	46,791	39,624	29,189	799,624	6,013,464	2,450,174	2,778,971	2,823,137
1995	20,014	20,620	11,791	247,645	4,066,595	1,532,502	952,304	877,047
1996	57,320	47,288	23,483	619,160	8,385,766	4,056,188	2,565,655	2,378,677
1997	67,416	52,935	21,955	986,312	7,010,228	2,870,194	2,637,433	2,469,147
1998	(11,427)	(10,141)	(4,879)	(133,721)	204,374	(365,361)	(319,014)	(295,861)
1999	34,881	25,288	11,623	507,549	6,333,906	2,421,869	1,691,167	1,446,775
2000	58,113	40,421	14,847	706,466	7,849,458	3,020,023	2,891,468	3,052,117
2001	374,919	250,132	214,039	4,248,059	27,592,213	10,690,521	15,011,328	15,907,217
2002	192,540	104,564	61,470	2,036,126	17,666,689	7,284,182	8,870,415	9,554,380
2003	198,509	118,446	97,810	2,592,633	24,698,300	9,177,248	10,700,053	11,535,369
2004	261,564	138,880	106,974	2,414,624	22,854,796	9,426,446	12,567,612	13,722,260
2005	289,322	146,837	148,291	2,773,818	33,561,779	12,664,845	11,765,327	12,532,444
2006	231,646	110,822	143,783	2,473,204	23,274,172	10,059,712	11,063,183	11,835,390
2007	453,385	223,276	253,979	4,745,772	23,299,146	11,457,343	17,216,558	18,676,942
2008	406,994	183,126	293,675	3,262,284	14,018,652	6,267,150	11,024,961	12,718,735
2009	242,431	114,019	179,566	2,755,951	14,991,789	4,788,936	7,850,846	8,720,395
2010	263,027	110,871	218,665	2,497,045	27,421,416	9,915,364	11,196,109	11,791,214
2011	273,550	114,447	231,940	3,358,456	40,236,540	15,429,584	14,773,702	15,486,663
2012	280,705	129,591	197,764	3,868,454	24,854,784	12,843,792	14,952,646	15,239,920
2013	466,256	219,196	345,608	5,543,567	24,503,931	10,217,389	14,064,583	14,506,382
2014	446,202	104,685	426,121	5,011,445	19,126,329	5,816,875	10,767,667	11,050,959
<b>2015</b>	<b>430,242</b>	<b>227,195</b>	<b>410,611</b>	<b>5,662,800</b>	<b>43,775,889</b>	<b>17,544,460</b>	<b>21,714,984</b>	<b>22,230,343</b>
2016	422,692	224,186	403,397	6,005,482	44,329,445	17,492,276	21,691,288	22,204,492
2017	564,537	302,861	636,035	6,152,429	44,063,017	17,418,796	23,034,896	23,515,065
2018	564,537	302,861	636,035	6,152,429	30,242,210	17,418,796	23,034,896	23,515,065
2019	564,525	305,418	638,284	5,869,252	39,112,933	17,496,728	22,544,524	23,261,788
2020	564,525	305,418	638,284	5,869,252	36,839,771	17,496,728	22,548,579	23,266,186
2021	564,525	305,418	638,284	5,869,252	41,891,180	17,496,728	22,559,394	23,277,915
2022	564,525	305,418	638,284	5,869,252	35,865,012	17,496,728	22,571,560	23,291,111
2023	564,525	305,418	638,284	5,869,252	43,017,536	17,496,729	22,582,377	23,302,842
2024	564,525	305,418	638,284	5,869,252	37,653,911	17,496,727	22,594,539	23,316,033
2025	564,525	305,418	638,284	5,869,252	32,403,646	17,496,728	22,605,356	23,327,765
2026	564,525	305,418	638,284	5,869,252	40,322,016	17,496,728	22,612,115	23,335,095
2027	564,525	305,418	638,284	5,869,252	30,790,463	17,496,728	22,620,226	23,343,892
2028	564,525	305,418	638,284	5,869,252	42,992,414	17,496,728	22,626,985	23,351,223
2029	564,525	305,418	638,284	5,869,252	42,861,107	17,496,728	22,636,448	23,361,486
2030	564,525	305,418	638,284	5,869,252	32,231,180	17,496,728	22,644,559	23,370,283
2031	564,525	305,418	638,284	5,869,252	32,925,152	17,496,728	22,656,725	23,383,479
2032	564,525	305,418	638,284	5,869,252	34,336,698	17,496,728	22,667,539	23,395,207
2033	564,525	305,418	638,284	5,869,252	42,369,677	17,496,728	22,678,354	23,406,936
2034	564,525	305,418	638,284	5,869,252	36,839,771	17,496,728	22,689,168	23,418,665
2035	564,525	305,418	638,284	5,869,252	42,337,143	17,496,728	22,699,983	23,430,395
<b>TOTAL</b>	<b>16,344,741</b>	<b>8,659,524</b>	<b>16,363,502</b>	<b>190,060,103</b>	<b>1,259,526,125</b>	<b>550,343,011</b>	<b>688,654,480</b>	<b>714,123,605</b>

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

(b) Power costs for the period 1968 through 1987 are for an interim facility.

(c) The costs of Del Valle Pumping Plant are combined with those of South Bay Pumping Plant to simplify the cost allocations.

**TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant <sup>a</sup>**

(in dollars)

Sheet 2 of 3

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 16A	Reach 17E	Reach 18A	Reach 22B	Reach 23	Reach 26A	Reach 2B (EBX)	Reach 3A (EBX)
	Chrisman Pumping P.	Edmonston Pumping P.	Alamo Powerplant	Pearblossom Pumping Plant	Mojave Siphon Powerplant	Devil Canyon Powerplant	Greenspot Pumping Plant	Crafton Hills Pumping P.
	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	142,902	542,625	0	3,468	0	(3,024)	0	0
1973	387,198	1,548,428	0	202,289	0	(461,268)	0	0
1974	564,464	2,164,223	0	324,993	0	(546,156)	0	0
1975	1,095,331	4,010,395	0	575,061	0	(1,095,523)	0	0
1976	1,506,985	5,443,936	0	889,544	0	(1,566,056)	0	0
1977	652,643	2,345,033	0	315,128	0	(1,222,866)	0	0
1978	1,132,296	4,180,131	0	1,508,115	0	(3,085,094)	0	0
1979	1,526,850	5,475,688	0	1,838,687	0	(3,466,481)	0	0
1980	2,102,439	7,028,235	0	1,762,063	0	(3,318,152)	0	0
1981	2,838,773	9,351,931	0	2,296,771	0	(3,842,971)	0	0
1982	2,424,920	8,352,207	0	1,498,620	0	(2,736,072)	0	0
1983	793,915	2,375,225	0	397,766	0	(5,478,830)	0	0
1984	1,479,784	4,585,198	0	624,213	0	(7,350,989)	0	0
1985	2,812,461	9,365,591	0	1,226,515	0	(10,748,103)	0	0
1986	4,999,949	16,956,023	(1,013,756)	2,359,599	0	(11,484,996)	0	0
1987	4,586,919	15,121,886	(1,064,827)	1,907,854	0	(11,151,140)	0	0
1988	5,284,130	17,342,811	(744,374)	2,375,784	0	(14,495,967)	0	0
1989	8,772,733	29,455,330	(789,392)	4,235,981	0	(18,688,631)	0	0
1990	13,814,150	49,027,449	(841,172)	6,559,548	0	(21,045,321)	0	0
1991	2,535,180	9,033,684	(269,625)	996,352	0	(4,884,013)	0	0
1992	2,907,026	9,754,469	(975,679)	1,225,121	0	(9,782,946)	0	0
1993	(598,008)	(2,721,158)	(58,116)	(260,035)	0	(7,502,549)	0	0
1994	5,941,789	20,657,617	(60,125)	2,644,592	0	(11,998,949)	0	0
1995	1,752,212	5,829,425	(1,324,810)	1,106,460	0	(9,742,248)	0	0
1996	5,050,986	17,658,964	(2,955,178)	2,833,791	(979,429)	(12,358,465)	0	0
1997	5,545,919	19,859,875	(2,572,220)	3,156,995	(1,748,195)	(13,830,356)	0	0
1998	(664,843)	(2,312,472)	(2,016,390)	(443,482)	(1,253,110)	(10,108,555)	0	0
1999	3,616,732	13,967,075	(2,980,122)	1,837,476	(2,587,958)	(15,232,207)	0	0
2000	6,883,712	24,753,968	(5,123,988)	3,622,143	(4,402,610)	(25,758,437)	0	0
2001	35,394,917	129,212,359	(3,383,762)	18,868,242	(3,714,425)	(20,062,834)	0	0
2002	21,173,346	77,461,814	(5,057,760)	10,849,297	(5,371,837)	(25,292,454)	0	0
2003	25,608,686	94,057,399	(3,408,979)	14,580,326	(6,565,620)	(27,777,638)	0	0
2004	30,458,046	111,866,623	(6,431,864)	16,978,585	(7,858,117)	(32,044,505)	78,351	68,735
2005	27,661,065	97,703,918	(5,860,165)	17,372,818	(6,454,740)	(28,818,797)	69,550	48,964
2006	25,878,084	87,353,635	(4,091,143)	16,176,992	(6,391,206)	(34,897,387)	139,168	152,477
2007	40,760,732	140,256,411	(3,029,048)	19,403,658	(5,896,486)	(28,814,592)	270,007	265,495
2008	24,789,469	85,863,671	(3,426,928)	11,285,406	(3,300,797)	(16,968,293)	271,495	347,089
2009	18,259,199	70,377,883	(3,266,008)	8,591,756	(2,288,833)	(13,842,660)	352,008	370,086
2010	26,088,304	95,622,228	(5,115,083)	16,805,645	(5,653,201)	(24,769,829)	330,097	435,098
2011	33,869,853	118,603,333	(6,536,645)	23,278,915	(7,792,422)	(32,285,174)	389,197	504,647
2012	33,758,332	118,181,282	(2,492,869)	17,791,879	(8,905,115)	(23,525,846)	480,981	570,016
2013	31,695,300	111,773,698	(2,081,221)	13,004,133	(4,915,165)	(14,305,918)	513,831	601,249
2014	25,598,649	93,290,399	(2,851,812)	10,985,449	(3,334,131)	(7,394,250)	554,180	691,611
<b>2015</b>	<b>50,707,271</b>	<b>182,134,958</b>	<b>(7,944,878)</b>	<b>29,480,202</b>	<b>(10,732,930)</b>	<b>(24,471,500)</b>	<b>457,515</b>	<b>570,974</b>
2016	50,649,940	181,942,854	(7,927,570)	29,487,229	(10,675,257)	(24,329,000)	459,074	572,920
2017	53,582,473	196,659,184	(7,539,346)	27,190,419	(9,771,028)	(22,269,178)	502,519	627,139
2018	53,582,473	196,659,180	(7,534,902)	27,190,418	(9,771,027)	(22,269,178)	502,519	627,139
2019	53,028,951	194,448,492	(8,160,801)	30,047,086	(10,797,587)	(24,575,462)	502,519	627,139
2020	53,039,153	194,486,442	(8,146,010)	30,047,086	(10,797,587)	(24,575,462)	502,519	627,139
2021	53,066,362	194,587,652	(8,162,644)	30,047,086	(10,797,587)	(24,575,462)	502,519	627,139
2022	53,096,971	194,701,504	(8,162,614)	30,047,086	(10,797,587)	(24,575,461)	502,519	627,139
2023	53,124,185	194,802,727	(8,149,921)	30,047,091	(10,797,589)	(24,575,461)	502,519	627,139
2024	53,154,785	194,916,544	(8,162,512)	30,047,080	(10,797,585)	(24,575,462)	502,519	627,139
2025	53,181,999	195,017,773	(8,162,463)	30,047,087	(10,797,587)	(24,575,462)	502,519	627,139
2026	53,199,004	195,081,022	(8,145,748)	30,047,086	(10,797,587)	(24,575,462)	502,519	627,139
2027	53,219,410	195,156,924	(8,162,362)	30,047,086	(10,797,587)	(24,575,462)	502,519	627,139
2028	53,236,415	195,220,175	(8,162,352)	30,047,086	(10,797,587)	(24,575,461)	502,519	627,139
2029	53,260,222	195,308,735	(8,149,671)	30,047,086	(10,797,587)	(24,575,461)	502,519	627,139
2030	53,280,629	195,384,637	(8,162,241)	30,047,086	(10,797,587)	(24,575,462)	502,519	627,139
2031	53,311,239	195,498,495	(8,162,221)	30,047,086	(10,797,587)	(24,575,462)	502,519	627,139
2032	53,338,448	195,599,697	(8,145,507)	30,047,086	(10,797,587)	(24,575,462)	502,519	627,139
2033	53,365,655	195,700,900	(8,162,181)	30,047,086	(10,797,587)	(24,575,461)	502,519	627,139
2034	53,392,863	195,802,103	(8,162,120)	30,047,086	(10,797,587)	(24,575,461)	502,519	627,139
2035	53,420,073	195,903,308	(8,149,446)	30,047,086	(10,797,587)	(24,575,461)	502,519	627,139
<b>TOTAL</b>	<b>1,604,122,051</b>	<b>5,817,791,751</b>	<b>(249,460,571)</b>	<b>887,743,244</b>	<b>(313,922,618)</b>	<b>(1,084,908,245)</b>	<b>13,913,317</b>	<b>17,115,003</b>

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

**TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant <sup>a</sup>**

(in dollars)

Sheet 3 of 3

Calendar Year	CALIFORNIA AQUEDUCT (continued)						GRAND TOTAL
	Reach 4B (EBX) Cherry Valley Pumping P.	Reach 29A Oso Pumping Plant	Reach 29G Warne Powerplant	Reach 29J Castaic Powerplant	Reach 31A Las Perillas and Badger Hill Pumping Plants	Reach 33A Devil's Den, Bluestone and Polonio Pass Pumping Plants	
	[17]	[18]	[19]	[20]	[21]	[22]	
1961	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	36,771
1963	0	0	0	0	0	0	55,654
1964	0	0	0	0	0	0	73,240
1965	0	0	0	0	0	0	137,665
1966	0	0	0	0	0	0	186,064
1967	0	0	0	0	0	0	231,968
1968	0	0	0	0	118,676	0	1,117,913
1969	0	0	0	0	78,350	0	773,646
1970	0	0	0	0	136,429	0	1,103,798
1971	0	0	0	0	166,296	0	1,476,135
1972	0	79,315	0	(211,144)	212,938	0	3,073,359
1973	0	122,787	0	(1,057,564)	114,897	0	2,934,059
1974	0	157,511	0	(1,547,884)	111,442	0	3,683,880
1975	0	314,636	0	(2,455,461)	88,451	0	5,817,780
1976	0	326,967	0	(2,827,557)	139,279	0	8,211,705
1977	0	75,335	0	(3,734,462)	63,079	0	886,421
1978	0	89,383	0	(1,542,479)	176,153	0	7,272,153
1979	0	102,584	0	(2,776,030)	188,881	0	9,599,576
1980	0	236,768	0	(3,415,486)	168,458	0	10,419,251
1981	0	444,280	0	(2,834,322)	169,177	0	17,563,899
1982	0	539,245	(783,626)	(3,463,971)	168,390	0	13,477,272
1983	0	214,069	(1,488,439)	(6,649,718)	17,920	0	(7,452,864)
1984	0	484,239	(4,088,209)	(4,710,802)	112,679	0	(4,159,491)
1985	0	874,069	(5,930,176)	(15,698,638)	146,843	0	(9,861,182)
1986	0	1,269,590	(5,579,301)	(11,072,448)	297,886	0	11,622,736
1987	0	1,355,533	(6,445,265)	(11,726,458)	245,082	0	6,701,444
1988	0	1,515,349	(7,457,050)	(13,026,992)	214,519	0	6,239,207
1989	0	2,156,915	(8,822,367)	(15,535,849)	282,180	0	24,585,082
1990	0	2,913,030	(11,225,401)	(20,510,539)	416,832	0	48,154,174
1991	0	576,721	(3,882,595)	(6,579,194)	3,610	0	2,462,222
1992	0	829,862	(6,369,339)	(10,976,538)	101,665	0	(5,509,968)
1993	0	70,836	(4,665,393)	(9,531,404)	(111,306)	0	(24,907,973)
1994	0	1,503,796	(7,249,239)	(13,126,331)	206,086	(1,127)	13,499,083
1995	0	247,869	(1,934,202)	(4,049,615)	243,434	0	(142,957)
1996	0	895,929	(4,248,531)	(8,457,232)	296,170	0	15,870,542
1997	0	902,690	(4,824,488)	(8,776,260)	298,483	208,816	14,336,879
1998	0	(67,399)	(1,811,154)	(4,644,120)	(55,491)	(92,902)	(24,405,948)
1999	0	731,865	(5,831,573)	(9,811,777)	166,036	234,077	(3,417,317)
2000	0	1,250,249	(10,161,472)	(17,729,381)	218,543	361,521	(8,452,838)
2001	0	6,480,791	(7,918,467)	(13,370,061)	1,072,998	2,162,821	219,031,010
2002	0	4,246,409	(11,349,183)	(19,513,997)	547,531	1,344,783	94,808,314
2003	0	4,644,398	(10,436,535)	(17,134,431)	638,251	1,539,716	134,863,941
2004	7,271	5,667,657	(12,281,228)	(21,354,179)	673,974	1,799,785	149,122,292
2005	2,568	3,693,925	(7,106,531)	(13,339,416)	852,818	1,738,896	161,427,536
2006	18,724	2,828,104	(7,208,025)	(12,042,760)	834,329	1,487,207	129,430,110
2007	14,439	7,671,084	(11,444,524)	(21,845,299)	1,319,134	2,310,113	217,567,526
2008	10,854	4,984,155	(7,762,363)	(14,997,326)	1,103,802	1,643,974	132,019,786
2009	9,783	4,315,147	(6,997,502)	(16,308,270)	781,722	1,117,982	101,116,227
2010	22,485	3,821,649	(6,643,531)	(11,641,405)	932,791	1,499,909	155,148,868
2011	36,135	3,565,586	(5,996,974)	(10,892,193)	1,144,443	2,168,966	209,962,550
2012	54,199	5,828,694	(8,863,057)	(15,797,149)	1,093,544	2,104,719	192,647,266
2013	71,350	7,190,512	(9,189,037)	(15,851,695)	1,522,535	2,182,745	192,079,230
2014	82,382	6,173,761	(5,543,500)	(9,133,000)	140,848	173,145	162,184,014
<b>2015</b>	<b>75,040</b>	<b>8,141,717</b>	<b>(8,436,250)</b>	<b>(14,028,750)</b>	<b>1,600,042</b>	<b>4,904,547</b>	<b>324,454,482</b>
2016	107,371	8,085,283	(8,364,000)	(13,890,500)	1,590,836	4,889,448	325,371,886
2017	125,251	10,215,102	(9,680,593)	(16,303,278)	825,539	5,388,023	345,239,862
2018	129,236	10,215,102	(9,680,476)	(16,303,278)	825,539	5,388,023	331,427,597
2019	120,769	8,517,571	(8,571,825)	(13,566,322)	815,463	5,229,730	337,459,175
2020	120,769	8,522,040	(8,549,109)	(13,573,528)	815,463	5,229,730	335,277,388
2021	120,769	8,533,957	(8,559,966)	(13,592,742)	815,463	5,229,730	340,444,972
2022	120,769	8,547,364	(8,601,046)	(13,614,359)	815,463	5,229,729	334,539,367
2023	120,769	8,559,282	(8,611,017)	(13,633,574)	815,463	5,229,729	341,838,305
2024	120,769	8,572,689	(8,626,716)	(13,655,191)	815,463	5,229,730	336,607,941
2025	120,769	8,584,607	(8,607,924)	(13,674,405)	815,463	5,229,730	331,520,219
2026	120,769	8,592,055	(8,616,948)	(13,686,414)	815,463	5,229,730	339,536,061
2027	120,769	8,600,993	(8,625,714)	(13,700,826)	815,463	5,229,730	330,086,870
2028	120,769	8,608,441	(8,660,064)	(13,712,835)	815,463	5,229,729	342,344,266
2029	120,769	8,618,869	(8,671,178)	(13,729,648)	815,463	5,229,729	342,340,234
2030	120,769	8,627,808	(8,679,944)	(13,744,059)	815,463	5,229,730	331,796,716
2031	120,769	8,641,215	(8,662,585)	(13,765,676)	815,463	5,229,730	332,669,687
2032	120,769	8,653,132	(8,676,824)	(13,784,890)	815,463	5,229,730	334,227,364
2033	120,769	8,665,050	(8,716,471)	(13,804,105)	815,463	5,229,729	342,347,679
2034	120,769	8,676,967	(8,705,332)	(13,823,320)	815,463	5,229,729	336,972,629
2035	120,769	8,688,885	(8,718,738)	(13,842,535)	815,463	5,229,729	342,612,932
<b>TOTAL</b>	<b>2,820,161</b>	<b>274,194,024</b>	<b>(404,560,997)</b>	<b>(725,131,072)</b>	<b>36,565,615</b>	<b>133,460,589</b>	<b>9,453,817,342</b>

(a) Starting with 2005 transmission costs that vary and depend on Power usage are included, therefore recovered through the variable component.

## Tables B-4 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-4 Maximum Contractual Table A Amounts**

(in acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA (a)				CENTRAL COASTAL AREA		
	Napa (b) County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	507	5,248	5,783	11,538	0	0	0
1968	0	0	0	6,900	15,000	88,000	109,900	0	0	0
1969	0	0	0	8,200	15,500	75,000	98,700	0	0	0
1970	0	0	0	10,000	16,200	88,000	114,200	0	0	0
1971	0	0	0	11,200	17,000	88,000	116,200	0	0	0
1972	0	0	0	12,400	17,900	88,000	118,300	0	0	0
1973	0	0	0	13,600	18,800	88,000	120,400	0	0	0
1974	0	0	0	14,800	19,600	88,000	122,400	0	0	0
1975	0	0	0	16,000	20,500	88,000	124,500	0	0	0
1976	0	0	0	17,200	21,300	88,000	126,500	0	0	0
1977	0	0	0	18,400	22,200	88,000	128,600	0	0	0
1978	0	0	0	19,600	23,100	88,000	130,700	0	0	0
1979	0	0	0	20,800	23,900	88,000	132,700	0	0	0
1980	0	500	500	22,000	24,800	88,000	134,800	1,000	946	1,946
1981	0	650	650	23,000	26,000	88,000	137,000	1,000	1,813	2,813
1982	0	800	800	24,000	27,200	88,000	139,200	2,000	3,626	5,626
1983	0	950	950	25,000	28,400	88,000	141,400	3,000	5,439	8,439
1984	0	1,100	1,100	26,000	29,600	88,000	143,600	4,500	8,198	12,698
1985	0	1,250	1,250	27,000	30,800	88,000	145,800	7,500	13,638	21,138
1986	0	1,400	1,400	28,000	32,100	88,000	148,100	10,000	18,210	28,210
1987	0	1,550	1,550	29,000	33,300	88,000	150,300	12,500	22,704	35,204
1988	5,745	9,726	15,471	30,000	34,500	88,000	152,500	15,500	28,222	43,722
1989	6,195	18,420	24,615	31,000	35,700	90,000	156,700	20,000	36,342	56,342
1990	6,940	21,250	28,190	32,000	36,900	92,000	160,900	25,000	45,486	70,486
1991	7,290	22,300	29,590	34,000	38,400	94,000	166,400	25,000	45,486	70,486
1992	7,840	24,170	32,010	36,000	39,900	96,000	171,900	25,000	45,486	70,486
1993	8,490	26,130	34,620	38,000	41,400	98,000	177,400	25,000	45,486	70,486
1994	9,135	28,080	37,215	40,000	42,000	100,000	182,000	25,000	45,486	70,486
1995	9,780	34,250	44,030	42,000	42,000	100,000	184,000	25,000	45,486	70,486
1996	10,425	37,800	48,225	44,000	42,000	100,000	186,000	25,000	45,486	70,486
1997	11,065	38,250	49,315	46,000	42,000	100,000	188,000	6,215	38,986	45,201
1998	11,710	38,710	50,420	46,000	42,000	100,000	188,000	6,215	38,986	45,201
1999	15,850	39,170	55,020	46,000	42,000	100,000	188,000	25,000	45,486	70,486
2000	16,325	39,620	55,945	68,000	42,000	100,000	210,000	25,000	45,486	70,486
2001	20,725	45,836	66,561	78,000	42,000	100,000	220,000	25,000	45,486	70,486
2002	21,100	46,296	67,396	78,000	42,000	100,000	220,000	25,000	45,486	70,486
2003	21,475	46,756	68,231	78,400	42,000	100,000	220,400	25,000	45,486	70,486
2004	21,850	47,206	69,056	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2005	22,225	47,256	69,481	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2006	22,550	47,306	69,856	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2007	22,875	47,356	70,231	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2008	23,200	47,406	70,606	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2009	23,525	47,456	70,981	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2010	29,025	47,506	76,531	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2011	29,025	47,556	76,581	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2012	29,025	47,606	76,631	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2013	29,025	47,656	76,681	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2014	29,025	47,706	76,731	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2015	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2016	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2017	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2018	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2019	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2020	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2021	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2022	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2023	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2024	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2025	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2026	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2027	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2028	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2029	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2030	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2031	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2032	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2033	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2034	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
2035	29,025	47,756	76,781	80,619	42,000	100,000	222,619	25,000	45,486	70,486
<b>TOTAL</b>	<b>1,080,965</b>	<b>2,049,856</b>	<b>3,130,821</b>	<b>3,720,815</b>	<b>2,459,248</b>	<b>6,510,783</b>	<b>12,690,846</b>	<b>1,189,430</b>	<b>2,218,494</b>	<b>3,407,924</b>

(a) Table A Amounts for the South Bay Area were supplied by non-project water for the period June 1962 through November 1967. Actual delivery quantities of project water are shown for 1967.

(b) District's Table A quantities exclude amounts during the period 1968 through 1987 that were supplied by non-project water.



**TABLE B-4 Maximum Contractual Table A Amounts**

(in acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural	Total				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	14,300	1,000	0	46,600	46,600	900	2,300	12,250	77,350
1969	14,325	3,000	0	95,700	95,700	1,200	2,500	46,350	163,075
1970	15,700	3,000	28,700	116,400	145,100	1,300	2,600	34,300	202,000
1971	17,900	3,000	35,700	154,600	190,300	1,300	2,800	36,500	251,800
1972	20,000	3,000	39,200	231,500	270,700	1,400	5,366	112,600	413,066
1973	22,000	3,000	43,500	267,000	310,500	1,500	3,100	43,552	383,652
1974	33,390	3,000	48,000	299,000	347,000	1,500	3,471	72,289	460,650
1975	40,555	3,000	52,700	358,120	410,820	1,600	3,576	86,258	545,809
1976	30,921	3,000	56,100	386,050	442,150	1,600	4,039	61,707	543,417
1977	30,400	3,000	60,600	423,000	483,600	1,700	3,700	59,000	581,400
1978	32,500	0	64,100	470,200	534,300	1,900	3,900	63,300	635,900
1979	38,544	3,000	67,600	516,300	583,900	2,000	4,000	71,241	702,685
1980	41,000	3,000	71,100	563,400	634,500	2,200	5,700	71,700	758,100
1981	41,000	3,000	74,800	616,600	691,400	2,300	4,300	76,000	818,000
1982	41,000	3,000	79,600	665,700	745,300	2,500	4,500	80,200	876,500
1983	42,900	3,000	83,500	721,600	805,100	2,800	3,770	9,548	867,118
1984	45,100	3,000	103,600	757,000	860,600	3,100	4,800	62,611	979,211
1985	47,200	3,000	108,900	806,100	915,000	3,400	4,900	45,549	1,019,049
1986	49,300	3,000	113,400	820,246	933,646	3,700	5,100	97,200	1,091,946
1987	51,400	3,000	119,100	904,400	1,023,500	4,000	5,200	101,400	1,188,500
1988	53,500	3,000	123,900	950,700	1,074,600	4,000	5,400	105,600	1,246,100
1989	55,600	3,000	128,200	984,100	1,112,300	4,000	5,600	109,900	1,290,400
1990	28,850	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,313,450
1991	53,411	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,338,011
1992	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1993	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1994	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1995	57,700	3,000	134,600	1,018,800	1,153,400	4,000	5,700	118,500	1,342,300
1996	53,370	3,000	134,600	982,460	1,117,060	4,000	5,700	118,500	1,301,630
1997	53,370	3,000	134,600	978,130	1,112,730	4,000	5,700	118,500	1,297,300
1998	53,370	3,000	134,600	953,130	1,087,730	4,000	5,700	118,500	1,272,300
1999	53,370	3,000	134,600	953,130	1,087,730	4,000	5,700	118,500	1,272,300
2000	53,370	3,000	134,600	886,130	1,020,730	4,000	5,700	118,500	1,205,300
2001	53,370	3,000	134,600	866,349	1,000,949	4,000	5,700	118,500	1,185,519
2002	57,343	3,000	134,600	866,349	1,000,949	4,000	5,700	111,527	1,182,519
2003	57,343	3,000	134,600	866,349	1,000,949	4,000	5,700	111,127	1,182,119
2004	57,343	3,000	134,600	864,130	998,730	9,000	5,700	96,227	1,170,000
2005	57,343	3,000	134,600	864,130	998,730	9,000	5,700	96,227	1,170,000
2006	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2007	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2008	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2009	57,343	3,000	134,600	864,130	998,730	9,305	5,700	95,922	1,170,000
2010	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2011	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2012	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2013	50,343	3,000	134,600	848,130	982,730	9,305	5,700	88,922	1,140,000
2014	48,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,136,556
<b>2015</b>	<b>45,350</b>	<b>3,000</b>	<b>134,600</b>	<b>848,130</b>	<b>982,730</b>	<b>9,305</b>	<b>5,700</b>	<b>87,471</b>	<b>1,133,556</b>
2016	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2017	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2018	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2019	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2020	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2021	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2022	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2023	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2024	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2025	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2026	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2027	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2028	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2029	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2030	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2031	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2032	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2033	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2034	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2035	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
<b>TOTAL</b>	<b>3,008,632</b>	<b>199,000</b>	<b>7,693,900</b>	<b>51,855,303</b>	<b>59,549,203</b>	<b>403,050</b>	<b>352,822</b>	<b>5,959,901</b>	<b>69,472,608</b>

**TABLE B-4 Maximum Contractual Table A Amounts**

(in acre-feet)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	3,700	0	0	0	0	0	0	0	0
1969	0	5,000	0	0	0	0	0	0	0	0
1970	0	5,700	0	0	0	0	0	0	0	0
1971	0	6,700	0	0	0	0	0	0	0	0
1972	20,000	8,936	5,200	526	8,000	170	8,400	1,620	1,677	122
1973	25,000	12,400	5,800	870	9,000	290	10,700	2,940	48,000	11,500
1974	30,000	15,400	6,400	1,160	10,000	400	13,100	4,260	50,000	12,300
1975	35,000	18,200	7,000	1,450	11,000	520	15,400	5,580	52,500	13,100
1976	44,000	21,200	7,600	1,740	12,000	640	17,800	6,900	55,000	14,000
1977	50,000	24,100	8,421	2,030	13,000	730	20,200	8,220	57,500	14,800
1978	57,000	24,762	9,242	2,320	14,000	920	0	9,340	60,000	15,700
1979	63,000	28,000	10,063	2,610	15,000	1,040	24,900	10,260	62,500	16,600
1980	69,200	30,400	10,884	2,900	17,000	1,150	27,200	11,180	65,500	17,400
1981	75,000	32,800	12,105	3,190	19,000	1,270	23,100	11,700	68,500	18,300
1982	81,300	34,800	13,326	3,480	21,000	1,380	22,843	12,320	71,500	19,100
1983	87,700	37,300	14,547	3,770	23,000	1,500	34,300	12,940	74,500	19,900
1984	35,000	39,600	15,768	4,060	25,000	1,610	36,700	13,560	78,000	20,700
1985	40,000	41,800	16,989	4,350	27,000	1,730	39,000	14,180	81,500	21,800
1986	42,000	43,600	18,210	4,640	29,000	1,840	41,400	14,800	85,000	23,200
1987	44,000	45,600	19,431	4,930	31,500	1,960	43,700	15,420	89,000	24,600
1988	46,000	48,000	20,652	5,220	34,000	2,070	46,000	16,040	93,000	26,000
1989	125,700	50,100	21,873	5,510	36,500	2,190	48,500	16,660	97,000	27,400
1990	132,100	52,000	23,100	5,800	38,100	2,300	50,800	17,300	101,500	28,800
1991	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1992	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1993	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1994	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1995	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1996	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1997	138,400	54,200	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800
1998	138,400	54,200	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800
1999	138,400	54,200	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800
2000	138,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2001	138,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2002	141,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2003	141,400	95,200	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2004	141,400	95,200	33,000	5,800	38,100	2,300	75,800	21,300	102,600	28,800
2005	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2006	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2007	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2008	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2009	141,400	95,200	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800
2010	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2011	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2012	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2013	141,400	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2014	144,844	95,200	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800
2015	<b>144,844</b>	<b>95,200</b>	<b>138,350</b>	<b>5,800</b>	<b>55,750</b>	<b>2,300</b>	<b>82,800</b>	<b>21,300</b>	<b>102,600</b>	<b>28,800</b>
2016	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2017	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2018	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2019	144,844	95,200	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800
2020	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2021	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2022	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2023	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2024	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2025	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2026	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2027	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2028	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2029	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2030	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2031	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2032	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2033	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2034	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
2035	144,844	95,200	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800
<b>TOTAL</b>	<b>7,507,768</b>	<b>4,545,098</b>	<b>4,782,511</b>	<b>321,556</b>	<b>2,626,000</b>	<b>127,210</b>	<b>4,069,043</b>	<b>1,127,720</b>	<b>5,909,177</b>	<b>1,641,322</b>

**TABLE B-4 Maximum Contractual Table A Amounts**

(in acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	11,538
1968	0	0	0	3,700	0	300	250	550	0	191,500
1969	0	0	0	5,000	0	350	270	620	0	267,395
1970	0	0	0	5,700	0	400	300	700	0	322,600
1971	0	0	0	6,700	0	450	440	890	0	375,590
1972	0	154,772	0	209,423	0	500	470	970	0	741,759
1973	0	354,600	0	481,100	0	600	500	1,100	0	986,252
1974	0	454,900	0	597,920	0	700	530	1,230	0	1,182,200
1975	0	555,200	0	714,950	0	1,050	560	1,610	0	1,386,869
1976	0	655,600	0	836,480	0	1,400	590	1,990	0	1,508,387
1977	0	755,900	0	954,901	0	1,800	620	2,420	0	1,667,321
1978	0	856,300	0	1,049,584	0	1,200	650	1,850	0	1,818,034
1979	0	956,600	0	1,190,573	0	1,450	680	2,130	0	2,028,088
1980	6,800	1,057,000	1,000	1,317,614	0	1,100	710	1,810	0	2,214,770
1981	7,800	1,157,300	2,000	1,432,065	0	1,200	740	1,940	0	2,392,468
1982	8,800	1,257,600	3,000	1,550,449	0	1,200	770	1,970	0	2,574,545
1983	9,800	1,358,000	4,000	1,681,257	0	1,200	800	2,000	0	2,701,164
1984	10,800	1,458,300	5,000	1,744,098	1,600	1,200	830	3,630	0	2,884,337
1985	11,800	1,558,700	6,000	1,864,849	1,700	1,200	860	3,760	0	3,055,846
1986	12,900	1,659,300	8,000	1,983,890	2,100	1,200	890	4,190	0	3,257,736
1987	14,000	1,759,800	10,000	2,103,941	2,500	1,200	920	4,620	0	3,484,115
1988	15,100	1,860,400	13,000	2,225,482	2,900	1,200	960	5,060	0	3,688,335
1989	16,200	1,961,000	16,000	2,424,633	3,300	1,200	1,000	5,500	0	3,958,190
1990	17,300	2,011,500	20,000	2,500,600	3,800	1,200	1,040	6,040	0	4,079,666
1991	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,080	11,880	0	4,126,567
1992	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,120	11,920	0	4,138,816
1993	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,160	11,960	0	4,146,966
1994	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,200	12,000	0	4,154,201
1995	17,300	2,011,500	20,000	2,510,200	9,600	1,200	1,250	12,050	0	4,163,066
1996	0	2,011,500	20,000	2,492,900	9,600	1,200	1,300	12,100	0	4,111,341
1997	0	2,011,500	20,000	2,492,900	9,600	1,200	1,350	12,150	0	4,084,866
1998	0	2,011,500	20,000	2,517,900	9,600	1,200	1,400	12,200	0	4,086,021
1999	2,000	2,011,500	20,000	2,519,900	9,600	2,890	1,450	13,940	0	4,119,646
2000	3,000	2,011,500	20,000	2,565,900	9,600	2,890	1,510	14,000	0	4,121,631
2001	4,000	2,011,500	20,000	2,566,900	9,600	3,500	1,570	14,670	0	4,124,136
2002	4,000	2,011,500	20,000	2,569,900	9,600	3,500	1,630	14,730	0	4,125,031
2003	5,000	2,011,500	20,000	2,570,900	9,600	3,500	1,690	14,790	0	4,126,926
2004	6,000	2,011,500	20,000	2,581,800	9,600	3,500	0	13,100	0	4,127,061
2005	6,500	1,911,500	20,000	2,582,300	9,600	1,200	0	10,800	0	4,125,686
2006	7,000	1,911,500	20,000	2,582,800	9,600	1,200	324	11,124	0	4,126,885
2007	8,650	1,911,500	20,000	2,584,450	9,600	1,200	720	11,520	0	4,129,306
2008	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,020	39,120	0	4,165,931
2009	17,300	1,911,500	20,000	2,593,100	9,600	27,500	2,090	39,190	0	4,166,376
2010	17,300	1,911,500	20,000	2,623,100	9,600	1,731	2,160	13,491	0	4,146,227
2011	17,300	1,911,500	20,000	2,623,100	9,600	2,548	2,240	14,388	0	4,147,174
2012	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,320	39,420	0	4,172,256
2013	17,300	1,911,500	20,000	2,623,100	9,600	27,500	2,410	39,510	0	4,172,396
2014	17,300	1,911,500	20,000	2,626,544	9,600	27,500	2,500	39,600	0	4,172,536
<b>2015</b>	<b>17,300</b>	<b>1,911,500</b>	<b>20,000</b>	<b>2,629,544</b>	<b>9,600</b>	<b>27,500</b>	<b>2,600</b>	<b>39,700</b>	<b>0</b>	<b>4,172,686</b>
2016	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2017	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2018	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2019	17,300	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2020	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2021	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2022	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2023	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2024	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2025	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2026	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2027	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2028	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2029	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2030	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2031	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2032	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2033	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2034	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2035	17,300	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
<b>TOTAL</b>	<b>748,350</b>	<b>109,260,272</b>	<b>988,000</b>	<b>143,654,027</b>	<b>449,900</b>	<b>775,559</b>	<b>106,474</b>	<b>1,331,933</b>	<b>0</b>	<b>233,688,159</b>

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 1 of 17

Calendar Year	UPPER FEATHER AREA			NORTH BAY AQUEDUCT							Total
	BUTTE	Grizzly Valley Pipeline FC&WCD	YUBA	Reach 1	Reach 3A		Reach 3A-T		Reach 3B		
				SCWA	NC FC&WCD	SCWA	NC FC&WCD	SCWA	NC (a) FC&WCD	SCWA	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	1,214	0	1,214
1969	0	0	0	0	0	0	0	0	2,687	0	2,687
1970	0	70	0	0	0	0	0	0	3,618	0	3,618
1971	192	64	0	0	0	0	0	0	2,521	0	2,521
1972	186	505	0	0	0	0	0	0	3,647	0	3,647
1973	53	679	0	0	0	0	0	0	3,792	0	3,792
1974	127	648	0	0	0	0	0	0	4,870	0	4,870
1975	253	405	0	0	0	0	0	0	6,840	0	6,840
1976	527	382	0	0	0	0	0	0	7,122	0	7,122
1977	706	303	0	0	0	0	0	0	8,226	0	8,226
1978	579	278	0	0	0	0	0	0	6,034	0	6,034
1979	302	329	0	0	0	0	0	0	6,561	0	6,561
1980	267	295	0	0	0	0	0	0	6,707	0	6,707
1981	221	355	0	0	0	0	0	0	9,001	0	9,001
1982	334	305	0	0	0	0	0	0	1,213	0	1,213
1983	325	262	0	0	0	0	0	0	2,287	0	2,287
1984	177	272	108	0	0	0	0	0	2,923	0	2,923
1985	308	254	62	0	0	0	0	0	4,039	0	4,039
1986	313	317	328	1,400	0	0	0	0	3,519	0	4,919
1987	459	452	88	1,550	0	0	0	0	7,693	0	9,243
1988	385	523	303	1	0	9,725	0	0	5,392	0	15,118
1989	300	486	403	10	0	17,246	0	0	6,195	0	23,451
1990	380	548	494	3,275	0	15,856	0	0	6,940	0	26,071
1991	328	420	265	3,117	0	3,855	0	0	1,380	0	8,352
1992	117	485	642	5,553	0	9,220	0	0	4,001	0	18,774
1993	256	444	746	14,709	0	14,471	0	0	5,286	0	34,466
1994	329	492	1,035	10,343	0	14,913	0	0	6,792	0	32,048
1995	203	308	910	5,452	0	15,893	0	0	5,182	0	26,527
1996	257	360	820	12,930	0	17,069	0	0	4,893	0	34,892
1997	185	231	1,005	16,029	0	17,501	0	0	4,341	0	37,871
1998	527	0	1,054	11,562	0	18,204	0	0	5,359	0	35,125
1999	286	0	1,096	15,191	0	19,562	0	0	5,304	0	40,057
2000	586	0	901	15,490	0	11,290	0	10,235	4,958	0	41,973
2001	513	0	1,065	14,849	0	11,377	0	8,360	9,345	0	43,931
2002	419	0	1,181	18,841	0	11,130	0	8,589	6,875	0	45,435
2003	551	0	1,324	17,260	0	9,682	9	7,009	7,637	0	41,597
2004	1,440	0	1,434	20,951	0	10,691	135	10,860	7,999	500	51,136
2005	527	0	1,894	18,290	0	10,585	160	8,444	7,509	500	45,488
2006	468	0	5,342	16,573	0	10,865	208	7,578	7,581	500	43,305
2007	956	0	2,327	19,187	0	12,301	180	15,312	10,777	500	58,257
2008	451	243	1,923	21,436	15	11,410	37	7,974	13,240	500	54,612
2009	581	200	2,114	15,004	0	8,651	27	6,795	10,877	500	41,854
2010	807	243	2,331	17,598	0	8,231	70	4,487	12,347	500	43,233
2011	1,092	98	2,297	15,202	0	7,761	39	5,032	11,275	0	39,309
2012	1,374	79	2,695	16,508	0	8,298	44	4,544	9,860	0	39,254
2013	908	366	4,850	16,525	0	10,082	0	9,322	12,478	0	48,407
2014	1,375	125	5,003	9,601	0	4,456	0	13,017	14,685	300	42,059
<b>2015</b>	<b>1,661</b>	<b>1,560</b>	<b>5,760</b>	<b>16,154</b>	<b>0</b>	<b>12,500</b>	<b>0</b>	<b>0</b>	<b>17,415</b>	<b>0</b>	<b>46,069</b>
2016	1,661	1,619	5,760	16,100	0	12,555	0	0	17,415	0	46,070
2017	1,661	1,619	5,760	16,100	0	12,555	0	0	17,415	0	46,070
2018	1,661	1,619	5,760	16,100	0	12,555	0	0	17,415	0	46,070
2019	1,786	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2020	1,846	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2021	1,911	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2022	1,982	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2023	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2024	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2025	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2026	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2027	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2028	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2029	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2030	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2031	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2032	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2033	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2034	2,061	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
2035	2,143	1,619	5,760	15,993	0	12,661	0	0	17,415	0	46,069
<b>TOTAL</b>	<b>61,974</b>	<b>45,766</b>	<b>167,000</b>	<b>690,772</b>	<b>15</b>	<b>585,727</b>	<b>909</b>	<b>127,558</b>	<b>668,737</b>	<b>3,800</b>	<b>2,077,518</b>

(a) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 2 of 17

Calendar Year	SOUTH BAY AQUEDUCT (b)										Total
	Reach 1		Reach 2	Reach 4	Reach 5		Reach 6	Reach 7	Reach 8	Reach 9	
	AC FC&WCD	ACWD	AC FC&WCD	AC FC&WCD	AC FC&WCD	ACWD	AC FC&WCD	ACWD	ACWD	SCVWD	
	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
1962	141	8,412	353	0	0	0	0	0	0	0	8,906
1963	814	10,914	917	0	0	0	0	0	0	0	12,645
1964	248	19,238	1,425	0	0	0	0	0	0	0	20,911
1965	637	15,280	1,830	138	0	0	0	1,127	0	15,014	34,026
1966	2,475	0	2,537	499	0	0	0	14,864	0	34,538	54,913
1967	1,527	0	2,391	862	0	0	0	12,882	0	39,101	56,763
1968	1,608	0	3,799	721	5	0	0	24,817	0	70,105	101,055
1969	1,165	0	3,459	1,851	160	0	0	813	0	62,264	69,712
1970	1,345	0	4,558	3,182	164	0	0	0	0	80,311	89,560
1971	546	0	1,908	2,403	160	0	0	5,961	0	87,606	98,584
1972	1,066	0	4,605	2,041	2,777	1,489	0	26,182	0	100,266	138,426
1973	430	0	1,123	1,193	229	0	0	2,521	0	88,582	94,078
1974	177	0	0	975	162	0	0	0	4	88,000	89,318
1975	137	0	1,783	1,864	120	0	714	393	593	88,000	93,604
1976	265	0	7,204	3,384	817	0	5,461	13,774	7,526	88,000	126,431
1977	210	0	4,491	2,213	524	0	5,206	11,284	7,556	76,220	107,704
1978	422	0	2,426	3,754	2,034	0	2,348	854	5,009	95,727	112,574
1979	197	0	4,283	5,567	3,937	0	5,341	3,430	7,444	91,991	122,190
1980	77	0	3,883	6,686	0	1,508	6,144	2,824	6,702	88,000	115,824
1981	1,250	0	4,648	5,273	1,157	5,752	7,262	7,595	8,570	88,000	129,507
1982	473	0	3,043	4,406	630	0	4,571	1,776	4,540	88,000	107,439
1983	179	0	2,712	1,714	50	0	111	0	3,157	86,733	94,656
1984	165	0	4,219	2,219	55	0	126	0	3,338	88,000	98,122
1985	213	0	5,199	2,060	63	0	7,537	11,203	7,813	88,000	122,088
1986	200	0	6,052	2,062	212	0	2,083	5,311	7,068	88,000	110,988
1987	218	0	7,538	2,372	285	0	12,993	15,488	9,902	88,000	136,796
1988	222	0	8,302	4,681	189	0	12,436	24,259	9,205	87,961	147,255
1989	222	0	8,051	6,562	418	0	10,974	17,340	8,702	90,000	142,269
1990	256	0	8,160	8,347	593	0	15,678	22,149	9,554	91,800	156,537
1991	162	0	3,676	3,269	359	0	1,945	9,155	3,493	28,200	50,259
1992	217	0	5,177	2,188	154	0	6,933	12,621	6,532	42,839	76,661
1993	190	0	5,843	8,430	5,964	1,650	13,208	1,792	6,829	62,065	105,971
1994	132	0	4,482	5,427	822	0	9,679	3,379	19,532	57,115	100,568
1995	278	0	6,236	7,195	955	0	15,427	21	17,792	28,756	76,640
1996	277	0	6,151	5,119	388	0	6,968	1,871	11,591	44,850	77,215
1997	138	0	6,647	6,501	1,582	1,323	12,654	1,876	10,864	60,601	102,186
1998	106	0	3,748	2,493	1,277	0	8,347	3,817	11,478	39,610	70,876
1999	148	0	5,048	8,227	1,444	0	13,133	5,326	16,226	52,945	102,497
2000	110	0	7,464	9,761	946	0	16,396	4,498	18,100	78,258	135,533
2001	105	0	7,822	4,879	3,010	0	13,593	0	18,004	47,922	95,335
2002	93	0	7,758	11,619	2,446	0	17,058	5,112	20,616	58,875	123,577
2003	108	0	7,916	11,348	2,887	0	16,684	5,037	12,753	75,981	132,714
2004	72	0	11,754	9,737	3,763	0	21,260	4,968	14,916	59,458	125,928
2005	1,430	0	11,520	10,100	1,826	0	16,597	4,139	10,160	52,364	108,136
2006	830	0	11,546	4,097	2,123	0	19,870	2,708	12,924	64,174	118,272
2007	179	0	10,066	2,563	3,107	0	23,205	8,255	15,107	71,690	134,172
2008	238	0	11,424	2,206	1,899	0	25,363	4,421	18,481	52,530	116,562
2009	211	0	7,054	5,437	1,987	0	16,398	2,551	16,945	66,364	116,947
2010	160	0	7,788	7,528	1,824	0	17,043	330	15,241	45,888	95,802
2011	1,541	0	6,282	6,887	2,173	0	20,098	7	15,203	60,761	112,952
2012	262	0	7,598	9,987	2,972	0	14,112	0	13,331	63,794	112,056
2013	237	0	11,253	9,988	3,171	0	20,197	31	23,609	78,623	147,119
2014	243	0	8,404	6,400	2,558	0	16,137	9,239	7,647	54,405	105,033
<b>2015</b>	<b>245</b>	<b>0</b>	<b>3,750</b>	<b>10,550</b>	<b>1,855</b>	<b>0</b>	<b>26,971</b>	<b>4,000</b>	<b>21,200</b>	<b>68,431</b>	<b>137,002</b>
2016	245	0	3,900	11,050	1,855	0	31,321	4,000	19,398	68,431	140,200
2017	245	0	3,900	12,700	1,855	0	29,671	4,000	19,398	68,431	140,200
2018	245	0	3,900	13,650	1,855	0	28,721	4,000	19,398	68,431	140,200
2019	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2020	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2021	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2022	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2023	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2024	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2025	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2026	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2027	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2028	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2029	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2030	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2031	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2032	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2033	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2034	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
2035	460	0	15,400	8,500	3,770	0	20,241	5,729	19,471	60,000	133,571
<b>TOTAL</b>	<b>33,152</b>	<b>53,844</b>	<b>570,806</b>	<b>430,875</b>	<b>135,888</b>	<b>11,722</b>	<b>922,071</b>	<b>431,394</b>	<b>854,438</b>	<b>4,720,011</b>	<b>8,164,201</b>

(b) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.



**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 3 of 17

Calendar Year	CALIFORNIA AQUEDUCT										
	NORTH SAN JOAQUIN DIVISION						SAN LUIS DIVISION				
	Reach 1	Reach 2A					Reach 3			Reach 3A	
	KCWA	AC	KCWA								
(AG)	FC&WCD	(AG)	OFWD (c)	SCVWD	TLBWSD	DRWD	MWDSC	SCVWD	AVEK	CLWA	
[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	[33]	
1962	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	3,084	0	0	0	0	0	0	
1969	0	0	0	3,016	0	0	0	0	0	0	
1970	0	0	0	5,911	0	0	0	0	0	0	
1971	0	0	0	7,212	0	0	0	0	0	0	
1972	0	0	0	8,166	0	0	0	0	0	0	
1973	0	0	0	3,214	0	0	0	0	0	0	
1974	0	0	0	3,471	0	0	0	0	0	0	
1975	0	0	0	3,576	0	0	0	0	0	0	
1976	0	0	0	4,112	0	0	0	0	0	0	
1977	0	0	0	1,472	0	0	0	0	0	0	
1978	0	0	0	3,906	0	0	0	0	0	0	
1979	0	0	0	6,149	0	0	0	0	0	0	
1980	0	0	0	5,700	0	0	0	0	0	0	
1981	0	0	0	4,300	0	0	0	0	0	0	
1982	0	0	0	3,838	0	0	0	0	0	0	
1983	0	0	0	3,822	0	0	0	0	0	0	
1984	0	0	0	5,700	0	0	0	0	0	0	
1985	0	0	0	5,433	0	0	0	0	0	0	
1986	0	0	0	5,107	0	0	0	0	0	0	
1987	0	0	0	5,625	0	0	0	0	0	0	
1988	0	0	0	4,412	0	0	0	0	0	0	
1989	0	0	0	6,091	0	300	602	0	0	0	
1990	0	0	0	2,922	200	0	0	0	0	0	
1991	0	0	0	141	0	0	0	0	0	0	
1992	0	0	0	2,239	0	0	0	0	0	0	
1993	0	0	0	2,858	0	0	0	0	0	0	
1994	0	0	0	3,071	0	0	0	0	0	0	
1995	0	0	0	5,169	0	0	0	0	0	0	
1996	0	0	0	4,904	0	0	0	0	0	0	
1997	0	0	0	5,238	0	0	0	11,100	0	0	
1998	0	0	0	4,401	0	0	0	(11,100)	0	0	
1999	0	0	0	4,871	0	0	0	0	0	0	
2000	0	0	0	4,508	0	0	0	0	0	0	
2001	0	0	638	3,592	0	0	0	0	0	0	
2002	0	0	773	4,885	0	0	0	0	0	0	
2003	0	7	917	4,266	0	0	0	0	0	0	
2004	0	38	786	4,629	0	0	0	0	0	0	
2005	0	299	1,046	4,194	0	0	0	0	0	0	
2006	0	321	1,103	4,242	0	0	321	0	0	0	
2007	0	320	1,031	3,567	0	0	0	0	0	0	
2008	8,885	56	1,744	1,985	0	0	0	0	5,873	0	
2009	0	0	1,169	1,993	0	0	0	0	0	3,300	
2010	0	0	1,124	2,906	0	0	0	0	0	0	
2011	0	0	1,112	2,715	0	0	0	0	0	0	
2012	0	0	1,258	3,208	0	0	0	0	0	0	
2013	0	0	1,156	2,820	0	0	0	0	0	0	
2014	0	0	431	1,586	0	0	0	0	14,532	0	
2015	0	0	1,300	3,420	0	0	0	0	0	0	
2016	0	0	1,300	3,420	0	0	0	0	0	0	
2017	0	0	1,300	3,420	0	0	0	0	0	0	
2018	0	0	1,300	3,420	0	0	0	0	0	0	
2019	0	0	1,171	3,420	0	0	0	0	0	0	
2020	0	0	1,171	3,420	0	0	0	0	0	0	
2021	0	0	1,171	3,420	0	0	0	0	0	0	
2022	0	0	1,171	3,420	0	0	0	0	0	0	
2023	0	0	1,171	3,420	0	0	0	0	0	0	
2024	0	0	1,171	3,420	0	0	0	0	0	0	
2025	0	0	1,171	3,420	0	0	0	0	0	0	
2026	0	0	1,171	3,420	0	0	0	0	0	0	
2027	0	0	1,171	3,420	0	0	0	0	0	0	
2028	0	0	1,171	3,420	0	0	0	0	0	0	
2029	0	0	1,171	3,420	0	0	0	0	0	0	
2030	0	0	1,171	3,420	0	0	0	0	0	0	
2031	0	0	1,171	3,420	0	0	0	0	0	0	
2032	0	0	1,171	3,420	0	0	0	0	0	0	
2033	0	0	1,171	3,420	0	0	0	0	0	0	
2034	0	0	1,171	3,420	0	0	0	0	0	0	
2035	0	0	1,171	3,420	0	0	0	0	0	0	
<b>TOTAL</b>	<b>8,885</b>	<b>1,041</b>	<b>39,395</b>	<b>262,047</b>	<b>200</b>	<b>300</b>	<b>602</b>	<b>0</b>	<b>14,532</b>	<b>5,873</b>	<b>3,300</b>

(c) Includes 425 AF of 1988 advance allocation and 141 AF of 1992 advance allocation.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 4 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)											
	Reach 3A						Reach 4					Reach 5
	DRWD	KCWA		MWDSC	SCVWD	TLWSD	CLWA	DRWD	KCWA		TLBWSD	CLWA
(M&I)		(AG)	(M&I)						(AG)			
[34]	[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	1,898	0	12,647	0	0
1990	0	0	0	0	0	0	0	0	0	0	1,500	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	5,095
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	14,446	0	3,500	0	0
1996	0	0	0	0	0	0	0	0	1,125	4,162	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	1,300	0
2000	0	3,320	68,960	0	0	0	0	0	1,517	878	0	0
2001	0	0	140,242	0	30,000	0	0	0	0	0	0	0
2002	0	6,000	62,024	0	0	0	0	0	0	0	0	0
2003	0	0	151,044	29,596	0	0	0	0	0	1,351	0	0
2004	0	0	44,877	0	0	0	0	0	0	0	0	0
2005	0	0	109,712	50,000	8,804	277	0	0	0	7,000	0	0
2006	0	0	19,575	0	0	0	0	0	0	0	0	0
2007	0	71,567	116,272	0	0	0	0	0	0	0	0	0
2008	0	0	94,562	0	0	0	0	0	0	10,721	0	0
2009	0	0	158,590	52,933	9,999	0	0	0	0	0	0	0
2010	0	0	35,896	120,274	9,993	0	0	0	0	0	0	0
2011	0	0	0	78,324	0	0	0	0	0	0	0	0
2012	6,068	0	23,401	0	0	0	0	0	0	0	0	0
2013	0	0	64,524	0	6,000	0	6,000	0	0	0	0	0
2014	6,350	0	161,258	0	8,546	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	12,418	80,887	1,250,937	331,127	73,342	277	6,000	16,344	2,642	40,259	2,800	5,095

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 5 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)							SOUTH SAN JOAQUIN DIVISION				
	Reach 5							Reach 6				
	DRWD	EWSID	KCWA		MWDSC	OFWD	TLBWSD	EWSID	KCWA		CK	MWDSC
(M&I)			(AG)	(M&I)					(AG)			
[46]	[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]	[56]	[57]	
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	1,550	0	0	0	0	0	0
1989	0	0	0	18,831	0	0	0	0	8,260	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
1992	10,823	0	0	0	0	0	0	0	0	0	0	0
1993	27,200	0	0	28,200	0	2,000	1,624	0	31,200	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	21,776	0	0	0	0	3,932	0	0	0
1996	0	0	1,125	81,507	0	0	4,000	0	0	0	0	0
1997	0	0	9,080	154,940	0	0	3,500	0	0	0	0	0
1998	0	0	0	0	0	0	0	20,400	33,340	0	0	0
1999	0	0	0	0	21,500	0	8,000	0	33,776	0	11,000	0
2000	0	0	8,130	57,647	0	0	0	1,457	35,847	0	0	0
2001	0	0	0	0	0	0	2,457	0	0	0	0	0
2002	0	0	0	0	0	0	3,000	0	0	0	0	0
2003	0	0	0	0	0	0	3,900	0	0	0	0	0
2004	0	0	0	0	0	0	3,850	0	0	3,250	0	0
2005	0	0	0	0	0	0	1,000	0	0	6,954	0	0
2006	0	0	0	0	0	0	3,000	0	0	2,659	0	0
2007	0	0	0	0	0	0	3,600	0	0	3,119	0	0
2008	0	0	0	0	0	0	1,355	0	0	2,159	0	0
2009	0	870	0	0	0	0	1,490	0	0	1,779	0	0
2010	0	431	0	0	0	0	0	0	0	2,477	0	0
2011	0	0	0	0	0	0	0	400	0	2,964	0	0
2012	0	449	0	0	0	0	2,800	514	0	2,706	0	0
2013	0	692	0	8,393	0	0	5,350	280	0	2,666	0	0
2014	0	303	0	0	0	0	0	38	0	712	0	0
<b>2015</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,120</b>	<b>0</b>	<b>0</b>
2016	0	0	0	0	0	0	0	0	0	3,120	0	0
2017	0	0	0	0	0	0	0	0	0	3,120	0	0
2018	0	0	0	0	0	0	0	0	0	3,120	0	0
2019	0	0	0	0	0	0	0	0	0	3,120	0	0
2020	0	0	0	0	0	0	0	0	0	3,120	0	0
2021	0	0	0	0	0	0	0	0	0	3,120	0	0
2022	0	0	0	0	0	0	0	0	0	3,120	0	0
2023	0	0	0	0	0	0	0	0	0	3,120	0	0
2024	0	0	0	0	0	0	0	0	0	3,120	0	0
2025	0	0	0	0	0	0	0	0	0	3,120	0	0
2026	0	0	0	0	0	0	0	0	0	3,120	0	0
2027	0	0	0	0	0	0	0	0	0	3,120	0	0
2028	0	0	0	0	0	0	0	0	0	3,120	0	0
2029	0	0	0	0	0	0	0	0	0	3,120	0	0
2030	0	0	0	0	0	0	0	0	0	3,120	0	0
2031	0	0	0	0	0	0	0	0	0	3,120	0	0
2032	0	0	0	0	0	0	0	0	0	3,120	0	0
2033	0	0	0	0	0	0	0	0	0	3,120	0	0
2034	0	0	0	0	0	0	0	0	0	3,120	0	0
2035	0	0	0	0	0	0	0	0	0	3,120	0	0
<b>TOTAL</b>	<b>38,023</b>	<b>2,745</b>	<b>18,335</b>	<b>371,294</b>	<b>21,500</b>	<b>2,000</b>	<b>50,476</b>	<b>1,232</b>	<b>21,857</b>	<b>146,355</b>	<b>96,965</b>	<b>11,000</b>

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 6 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 6		Reach 7						Reach 8C			
	TLBWSD	CLWA	DRWD	KCWA		CK	MWDSC	TLBWSD	DRWD	EWSID	KCWA	
(M&I)				(AG)	(M&I)						(AG)	
[58]	[59]	[60]	[61]	[62]	[63]	[64]	[65]	[66]	[67]	[68]	[69]	
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	1,978	0	0
1969	0	0	0	0	0	0	0	0	0	56	0	0
1970	0	0	0	0	0	0	0	0	0	3,942	0	0
1971	0	0	0	0	0	0	0	0	0	5,990	0	0
1972	0	0	0	0	0	0	0	0	0	5,795	0	0
1973	0	0	0	0	0	0	0	0	0	3,000	0	0
1974	0	0	0	0	0	0	0	0	0	3,000	0	0
1975	0	0	0	0	0	0	0	0	0	3,000	0	0
1976	0	0	0	0	0	0	0	0	0	3,000	0	0
1977	0	0	0	0	0	0	0	0	0	738	0	0
1978	0	0	0	0	0	0	0	0	0	454	0	0
1979	0	0	0	0	0	0	0	0	0	1,739	0	0
1980	0	0	0	0	0	0	0	0	0	894	0	0
1981	0	0	0	0	0	0	0	0	0	5,859	0	0
1982	0	0	0	0	0	0	0	0	0	361	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	5,197	0	0
1986	0	0	0	0	0	0	0	0	0	1,170	0	0
1987	0	0	0	0	0	0	0	0	0	2,525	0	0
1988	0	0	0	0	0	0	0	0	0	3,475	0	0
1989	0	0	0	0	5,262	0	0	0	2,391	3,000	0	0
1990	0	0	0	0	0	0	0	0	0	1,279	0	0
1991	0	0	0	0	0	0	0	0	0	221	0	0
1992	0	0	0	0	0	0	0	0	280	1,354	0	0
1993	0	0	0	18,157	10,043	0	0	0	0	2,741	0	0
1994	0	2,100	0	0	0	0	0	0	0	1,666	0	0
1995	0	0	0	10,875	20,595	0	0	0	0	1,631	989	10,527
1996	0	0	0	3,424	69,704	0	0	0	95	1,868	0	1,500
1997	0	0	0	27,079	32,463	0	0	0	0	0	0	1,500
1998	3,000	0	200	3,998	62,081	0	0	0	90	542	0	1,000
1999	23,000	0	0	7,923	19,500	0	500	4,470	86	3,176	0	400
2000	3,000	1,200	0	0	45,137	0	20,000	20,500	166	1,799	0	400
2001	600	0	0	0	0	0	0	0	14	1,360	0	0
2002	0	0	0	0	0	0	0	12,067	0	1,405	0	0
2003	0	0	0	0	0	0	0	15,103	0	1,436	0	0
2004	0	0	0	0	0	0	0	0	0	3,562	0	0
2005	0	0	0	0	0	6,904	0	4,000	0	3,834	0	0
2006	0	0	0	0	0	2,500	0	6,000	0	3,282	0	0
2007	0	0	0	0	16,214	0	0	2,545	0	2,084	0	0
2008	0	0	400	0	1,998	1,330	0	1,500	0	947	0	0
2009	2,100	0	1,400	0	0	0	0	600	0	164	0	0
2010	0	0	0	0	0	0	0	3,850	0	2,828	0	0
2011	0	0	0	0	0	0	0	2,500	0	1,515	0	0
2012	500	0	0	0	0	2,000	0	0	0	1,279	0	0
2013	1,159	0	500	0	0	0	0	1,121	0	595	0	0
2014	275	0	0	0	0	0	0	321	0	126	0	0
<b>2015</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,800</b>	<b>0</b>	<b>0</b>
2016	0	0	0	0	0	0	0	0	0	1,800	0	0
2017	0	0	0	0	0	0	0	0	0	1,800	0	0
2018	0	0	0	0	0	0	0	0	0	1,800	0	0
2019	0	0	0	0	0	0	0	0	0	1,800	0	0
2020	0	0	0	0	0	0	0	0	0	1,800	0	0
2021	0	0	0	0	0	0	0	0	0	1,800	0	0
2022	0	0	0	0	0	0	0	0	0	1,800	0	0
2023	0	0	0	0	0	0	0	0	0	1,800	0	0
2024	0	0	0	0	0	0	0	0	0	1,800	0	0
2025	0	0	0	0	0	0	0	0	0	1,800	0	0
2026	0	0	0	0	0	0	0	0	0	1,800	0	0
2027	0	0	0	0	0	0	0	0	0	1,800	0	0
2028	0	0	0	0	0	0	0	0	0	1,800	0	0
2029	0	0	0	0	0	0	0	0	0	1,800	0	0
2030	0	0	0	0	0	0	0	0	0	1,800	0	0
2031	0	0	0	0	0	0	0	0	0	1,800	0	0
2032	0	0	0	0	0	0	0	0	0	1,800	0	0
2033	0	0	0	0	0	0	0	0	0	1,800	0	0
2034	0	0	0	0	0	0	0	0	0	1,800	0	0
2035	0	0	0	0	0	0	0	0	0	1,800	0	0
<b>TOTAL</b>	<b>33,634</b>	<b>3,300</b>	<b>2,500</b>	<b>71,456</b>	<b>282,997</b>	<b>12,734</b>	<b>20,500</b>	<b>74,577</b>	<b>3,122</b>	<b>133,667</b>	<b>989</b>	<b>15,327</b>

**TABLE B-5A Annual Water Quantities Delivered from  
Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 7 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SOUTH SAN JOAQUIN DIVISION (continued)								
	Reach 8C		Reach 8D					Reach 9	
	CK	TLBWS	DRWD	KCWA		CK	SLOC FC&WCD	TLBWS	DRWD
(M&I)				(AG)					
	[70]	[71]	[72]	[73]	[74]	[75]	[76]	[77]	[78]
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	900	25,100	26,360	0	0	0	0	0	0
1969	100	7,081	31,375	0	0	0	0	0	0
1970	0	0	40,407	0	0	0	0	3,408	0
1971	3,700	80,906	41,053	0	0	0	0	41,579	0
1972	1,400	144,843	42,443	0	0	0	0	113,550	0
1973	1,500	26,317	22,057	0	1,500	0	0	24,147	0
1974	1,500	32,603	33,390	0	0	0	0	39,686	0
1975	1,600	41,536	40,555	0	0	0	0	44,722	0
1976	1,600	26,595	41,421	0	0	0	0	32,216	0
1977	1,530	12,984	11,153	0	0	0	0	5,097	0
1978	2,070	3,934	51,747	0	0	0	0	8,119	0
1979	2,000	74,758	38,544	0	0	0	0	80,363	0
1980	2,200	35,140	41,000	0	0	0	0	40,304	0
1981	2,300	50,888	41,000	0	0	0	0	32,550	0
1982	1,536	4,405	41,000	0	0	214	0	14,146	0
1983	3,550	1,001	42,900	0	0	0	0	5	0
1984	3,100	3,677	45,100	0	0	0	0	2,066	0
1985	3,400	68,638	46,251	0	0	0	0	41,153	0
1986	3,700	40,017	50,249	0	0	0	0	39,338	0
1987	4,000	30,359	46,288	0	0	0	0	62,725	0
1988	4,000	46,281	47,994	0	0	0	0	48,035	0
1989	4,000	63,703	52,158	0	0	0	0	63,947	0
1990	2,000	23,504	36,296	0	161	0	0	32,066	0
1991	0	1,697	927	0	0	0	0	483	0
1992	1,806	15,982	12,667	0	0	0	0	30,746	0
1993	4,000	57,112	23,221	0	0	0	0	65,732	197
1994	2,116	21,510	28,793	0	1,726	0	0	40,852	0
1995	4,000	40,934	45,240	2,959	27,270	0	0	57,435	0
1996	4,000	84,130	52,722	0	1,455	0	100	148,745	0
1997	0	9,467	57,496	0	0	0	100	9,402	4,900
1998	15	8,956	49,435	0	20,000	0	0	8,721	0
1999	4,000	90,334	58,290	0	9,000	0	0	162,631	0
2000	3,600	63,842	57,920	0	0	0	0	113,952	0
2001	1,560	23,300	40,155	0	6,089	0	0	58,369	0
2002	2,854	34,009	48,179	0	7,522	0	0	47,426	0
2003	3,692	25,317	45,732	0	8,350	0	0	61,521	0
2004	5,803	30,546	45,823	0	4,979	0	0	55,625	0
2005	4,057	42,450	58,627	0	0	1,891	0	92,552	0
2006	1,105	34,367	61,410	0	0	3,266	0	64,840	0
2007	657	31,305	39,974	0	7,740	1,921	0	49,633	0
2008	240	14,146	18,974	0	21,242	107	0	16,903	0
2009	1,612	13,522	12,037	0	19,684	0	0	16,794	5,500
2010	26	14,005	17,346	0	14,094	1,900	0	40,609	0
2011	2,160	23,814	22,427	0	65	1,194	0	30,827	292
2012	2,699	25,847	17,122	0	2,168	0	0	56,570	3,400
2013	1,029	16,490	19,605	0	4,239	950	0	24,241	1,941
2014	136	3,959	9,711	0	0	119	0	4,545	0
<b>2015</b>	<b>912</b>	<b>20,993</b>	<b>30,215</b>	<b>0</b>	<b>0</b>	<b>1,368</b>	<b>0</b>	<b>31,490</b>	<b>0</b>
2016	912	20,993	30,215	0	0	1,368	0	31,490	0
2017	912	20,993	30,215	0	0	1,368	0	31,490	0
2018	912	20,993	30,215	0	0	1,368	0	31,490	0
2019	2,280	21,341	26,006	0	0	0	0	32,012	0
2020	2,280	21,341	26,006	0	0	0	0	32,012	0
2021	2,280	21,341	26,006	0	0	0	0	32,012	0
2022	2,280	21,341	26,006	0	0	0	0	32,012	0
2023	2,280	21,341	26,006	0	0	0	0	32,012	0
2024	2,280	21,341	26,006	0	0	0	0	32,012	0
2025	2,280	21,341	26,006	0	0	0	0	32,012	0
2026	2,280	21,341	26,006	0	0	0	0	32,012	0
2027	2,280	21,341	26,006	0	0	0	0	32,012	0
2028	2,280	21,341	26,006	0	0	0	0	32,012	0
2029	2,280	21,341	26,006	0	0	0	0	32,012	0
2030	2,280	21,341	26,006	0	0	0	0	32,012	0
2031	2,280	21,341	26,006	0	0	0	0	32,012	0
2032	2,280	21,341	26,006	0	0	0	0	32,012	0
2033	2,280	21,341	26,006	0	0	0	0	32,012	0
2034	2,280	21,341	26,006	0	0	0	0	32,012	0
2035	2,280	21,341	26,006	0	0	0	0	32,012	0
<b>TOTAL</b>	<b>145,261</b>	<b>2,018,080</b>	<b>2,317,536</b>	<b>2,959</b>	<b>157,284</b>	<b>17,034</b>	<b>200</b>	<b>2,698,540</b>	<b>16,230</b>



**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 8 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 9			Reach 10A									
	KCWA		TLBWSD	AC FC&WCD	ACWD	CLWA	DRWD	KCWA		MWDSC	SBVMWD	SCVWD	TLBWSD
	(M&I)	(AG)						(M&I)	(AG)				
[79]	[80]	[81]	[82]	[83]	[84]	[85]	[86]	[87]	[88]	[89]	[90]	[91]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	30,951	0	0	0	0	0	0	0	0	0	0	0
1969	0	24,489	0	0	0	0	0	0	0	0	0	0	2,842
1970	0	46,114	1,855	0	0	0	0	0	158	0	0	0	4,315
1971	0	58,356	0	0	0	0	0	0	9,973	0	0	0	0
1972	0	75,464	0	0	0	0	0	0	5,876	0	0	0	0
1973	0	54,583	0	0	0	0	0	0	22,948	0	0	0	0
1974	0	63,814	0	0	0	0	0	10,019	22,719	0	0	0	0
1975	0	50,021	0	0	0	0	0	2,791	72,121	0	0	0	0
1976	0	53,465	0	0	0	0	0	74	50,444	0	0	0	0
1977	0	24,668	0	0	0	0	0	201	34,451	0	0	0	0
1978	0	72,231	0	0	0	0	0	0	161,889	0	0	0	0
1979	0	74,524	0	0	0	0	0	285	153,245	0	0	0	0
1980	0	79,946	0	0	0	0	0	3,780	131,836	0	0	0	0
1981	0	76,508	0	0	0	0	0	341	133,500	0	0	0	0
1982	0	76,877	0	0	0	0	0	4,700	164,832	0	0	0	0
1983	2,217	84,573	0	0	0	0	0	0	146,493	0	0	0	0
1984	4,100	85,732	0	0	0	0	0	6,910	150,302	0	0	0	0
1985	0	67,696	0	0	0	0	0	6,495	153,473	0	0	0	0
1986	0	79,943	0	0	0	0	0	5,065	198,099	0	0	0	0
1987	0	97,732	0	0	0	0	0	900	226,521	0	0	0	0
1988	1,100	83,858	0	0	0	0	0	9,529	212,495	0	0	0	0
1989	0	91,134	0	0	0	0	0	21,038	251,979	0	0	0	0
1990	0	83,108	0	0	0	0	0	25,189	47,472	0	0	0	0
1991	13,683	601	0	0	0	0	0	1,142	6,820	0	0	0	0
1992	28	40,183	0	0	0	0	0	3,685	89,390	0	0	0	0
1993	5,945	53,597	0	0	0	0	0	775	233,862	44,496	0	0	0
1994	0	44,994	0	0	0	0	0	5,227	126,792	0	0	0	0
1995	0	64,076	0	0	0	0	0	366	229,448	50,000	0	0	0
1996	2,236	89,291	0	0	6,200	0	0	6,666	199,854	95,000	0	45,000	0
1997	0	72,013	0	0	10,000	0	900	3,577	157,385	125,000	0	35,000	0
1998	0	57,530	0	1,970	3,780	0	0	2,603	163,587	39,500	0	23,800	0
1999	0	72,734	0	22,910	16,100	0	0	1,657	190,787	75,850	0	30,000	0
2000	0	73,562	0	23,940	13,380	0	0	7,672	283,208	0	0	23,730	0
2001	0	54,198	0	5,000	0	0	0	160	98,175	0	0	0	0
2002	0	60,957	0	14,287	2,083	24,000	0	145	171,498	0	0	3,311	0
2003	0	54,724	0	6,500	18,800	0	0	217	174,674	70,940	0	33,000	0
2004	0	54,330	0	5,740	8,000	32,522	0	65,751	117,286	0	0	0	0
2005	0	53,206	0	0	28,422	0	0	146	232,519	31,210	0	55,448	0
2006	0	56,909	0	5,740	27,447	0	5,000	0	237,623	0	0	64,036	0
2007	0	66,018	0	717	1,029	0	3,000	0	203,794	0	0	3,692	0
2008	0	63,315	0	0	0	0	2,800	1,702	103,176	0	0	4,306	0
2009	0	64,007	2,330	0	0	0	2,000	690	95,798	0	0	0	0
2010	0	76,357	0	3,000	7,000	0	2,000	14	102,773	74,000	0	51,990	800
2011	0	78,177	2,000	3,414	16,020	0	2,908	26	137,476	149,012	0	65,770	500
2012	0	69,395	2,000	0	7,500	0	1,660	29	201,876	45,000	2,868	0	0
2013	0	82,005	0	0	0	0	2,500	2,057	116,190	0	0	0	0
2014	0	49,654	0	0	0	0	0	0	14,564	0	0	0	0
2015	0	57,366	0	0	0	0	0	0	133,583	0	0	0	0
2016	0	57,366	0	0	1,802	0	0	0	133,583	0	0	0	0
2017	0	57,366	0	0	1,802	0	0	0	133,583	0	0	0	0
2018	0	57,366	0	0	1,802	0	0	0	133,583	0	0	0	0
2019	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2020	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2021	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2022	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2023	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2024	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2025	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2026	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2027	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2028	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2029	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2030	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2031	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2032	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2033	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2034	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
2035	0	57,366	0	0	0	0	0	0	141,941	0	0	0	0
TOTAL	29,309	4,192,306	8,185	93,218	171,167	56,522	22,768	201,624	8,986,710	800,008	2,868	439,083	8,457

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 9 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 11B					Reach 12D			Reach 12E				
	CLWA	DRWD	KCWA		TLBWSD	KCWA		AC FC&WCD	ACWD	CLWA	DRWD	KCWA	
(M&I)			(AG)	(M&I)		(AG)	(M&I)					(AG)	
[92]	[93]	[94]	[95]	[96]	[97]	[98]	[99]	[100]	[101]	[102]	[103]	[104]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	24,776	0	0	0	0	0	0	0	0	0
1969	0	0	0	64,682	0	0	0	0	0	0	0	0	0
1970	0	0	0	72,279	0	0	0	0	0	0	0	0	9,279
1971	0	0	0	63,773	0	0	0	0	0	0	0	0	28,056
1972	0	0	0	72,358	0	0	0	0	0	0	0	0	62,342
1973	0	0	0	67,544	0	0	0	0	0	0	0	0	13,082
1974	0	0	0	87,476	0	0	0	0	0	0	0	2,651	4,248
1975	0	0	0	85,675	0	0	0	0	0	0	0	0	10,787
1976	0	0	0	85,067	0	0	0	0	0	0	0	37,519	20,555
1977	0	0	3,981	29,603	0	0	0	0	0	0	0	20,280	1,737
1978	0	0	0	88,753	0	0	0	0	0	0	0	47,133	15,011
1979	0	0	484	108,379	0	0	0	0	0	0	0	50,740	61,567
1980	0	0	3,112	103,207	0	0	0	0	0	0	0	32,039	22,252
1981	0	0	494	104,395	0	0	0	0	0	0	0	59,917	58,470
1982	0	0	798	99,081	0	0	0	0	0	0	0	36,139	75,587
1983	0	0	2,069	94,117	0	0	0	0	0	0	0	0	10,950
1984	0	0	2,349	124,819	0	0	0	0	0	0	0	63,941	39,929
1985	0	0	10,666	118,646	0	0	0	0	0	0	0	69,839	84,117
1986	0	0	8,673	124,836	0	0	0	0	0	0	0	62,109	51,540
1987	0	0	13,074	111,877	0	0	0	0	0	0	0	95,297	86,223
1988	0	0	13,509	114,031	0	0	0	0	0	0	0	86,390	123,249
1989	0	0	9,986	127,058	0	0	0	0	0	0	0	83,965	146,544
1990	0	0	9,319	104,107	0	0	0	0	0	0	0	82,164	38,973
1991	0	0	6,099	118	0	0	0	0	0	0	0	8,842	303
1992	0	0	7,419	35,093	0	0	0	0	0	0	0	47,181	57,048
1993	0	0	2,696	72,645	0	0	0	0	0	0	0	84,822	285,554
1994	0	0	3,506	71,202	0	0	0	0	0	0	0	66,188	77,839
1995	0	0	1,154	97,072	0	0	0	0	0	0	1,000	107,130	181,097
1996	0	0	1,185	96,250	0	0	0	0	0	4,131	89,257	134,138	134,138
1997	0	0	1,111	104,823	0	0	0	0	0	8,012	32,061	128,329	128,329
1998	0	0	1,311	72,646	0	0	0	0	0	5,925	28,258	88,998	88,998
1999	0	0	2,127	92,262	0	0	0	0	0	1,321	110,161	255,343	255,343
2000	0	1,500	3,793	89,622	0	21	0	0	0	0	953	11,772	156,215
2001	0	0	636	73,105	0	41	0	0	0	0	0	385	51,076
2002	0	0	1,457	91,123	0	760	6	0	0	0	0	0	135,335
2003	0	0	1,379	87,174	0	2,431	152	0	0	0	0	39,479	112,056
2004	0	0	1,299	97,722	0	3,419	768	0	0	0	1,600	52,303	95,893
2005	0	0	824	93,554	0	2,841	644	3,419	1,878	20,000	1,154	43,835	340,281
2006	0	0	0	98,417	0	2,513	1,556	10,000	0	20,000	0	82,207	296,230
2007	0	0	4,030	94,334	0	2,164	2,284	0	0	8,200	0	1,179	87,764
2008	0	0	263	93,417	0	1,514	3,000	0	0	0	0	0	58,983
2009	0	300	127	96,776	0	564	4,274	0	0	0	0	0	82,434
2010	0	5,350	381	92,220	974	1,904	2,206	10,000	0	25,844	0	4,851	72,809
2011	0	0	1,160	105,682	3,500	973	65	10,000	1,960	0	0	26,249	313,619
2012	5,500	2,000	1,145	98,389	0	3,334	939	20,308	0	6,416	200	19,465	102,054
2013	5,500	2,500	1,167	110,418	0	3,473	1,531	0	0	0	0	26,652	60,295
2014	0	0	0	23,000	0	1,000	10,980	0	0	0	0	0	39,650
<b>2015</b>	<b>0</b>	<b>0</b>	<b>9,000</b>	<b>47,905</b>	<b>0</b>	<b>3,900</b>	<b>0</b>	<b>5,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>61,491</b>	<b>55,685</b>
2016	0	0	9,000	47,905	0	3,900	0	0	0	0	0	61,491	55,685
2017	0	0	9,000	47,905	0	3,900	0	0	0	0	0	61,491	55,685
2018	0	0	9,000	47,905	0	3,900	0	0	0	0	0	61,491	55,685
2019	0	0	9,000	44,254	0	7,200	0	0	0	13,920	0	49,744	68,236
2020	0	0	9,000	44,254	0	7,200	0	0	0	13,620	0	49,744	68,236
2021	0	0	9,000	44,254	0	7,200	0	0	0	12,820	0	49,744	68,236
2022	0	0	9,000	44,254	0	7,200	0	0	0	11,920	0	49,744	68,236
2023	0	0	9,000	44,254	0	7,200	0	0	0	11,120	0	49,744	68,236
2024	0	0	9,000	44,254	0	7,200	0	0	0	10,220	0	49,744	68,236
2025	0	0	9,000	44,254	0	7,200	0	0	0	9,420	0	49,744	68,236
2026	0	0	9,000	44,254	0	7,200	0	0	0	8,920	0	49,744	68,236
2027	0	0	9,000	44,254	0	7,200	0	0	0	8,320	0	49,744	68,236
2028	0	0	9,000	44,254	0	7,200	0	0	0	7,820	0	49,744	68,236
2029	0	0	9,000	44,254	0	7,200	0	0	0	7,120	0	49,744	68,236
2030	0	0	9,000	44,254	0	7,200	0	0	0	6,520	0	49,744	68,236
2031	0	0	9,000	44,254	0	7,200	0	0	0	5,620	0	49,744	68,236
2032	0	0	9,000	44,254	0	7,200	0	0	0	4,820	0	49,744	68,236
2033	0	0	9,000	44,254	0	7,200	0	0	0	4,020	0	49,744	68,236
2034	0	0	9,000	44,254	0	7,200	0	0	0	3,220	0	49,744	68,236
2035	0	0	9,000	44,254	0	7,200	0	0	0	2,420	0	49,744	68,236
<b>TOTAL</b>	<b>11,000</b>	<b>11,650</b>	<b>311,783</b>	<b>5,007,541</b>	<b>4,474</b>	<b>164,952</b>	<b>28,405</b>	<b>58,727</b>	<b>3,838</b>	<b>222,300</b>	<b>24,296</b>	<b>2,804,012</b>	<b>5,560,593</b>

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 10 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 12E			Reach 13B									
	MWDSC	SBVMWD	SCVWD	AC FC&WCD	ACWD	DRWD	KCWA		MWDSC	PWD	SBC FC&WCD	SCVWD	TLBWSD
(M&I)							(AG)						
[105]	[106]	[107]	[108]	[109]	[110]	[111]	[112]	[113]	[114]	[115]	[116]	[117]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	4,891	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	17,388	0	0	0	0	0
1973	0	0	0	0	0	0	0	9,297	0	0	0	0	0
1974	0	0	0	0	0	0	8,038	4,246	0	0	0	0	0
1975	0	0	0	0	0	0	8,538	7,059	0	0	0	0	0
1976	0	0	0	0	0	0	5,626	8,855	0	0	0	0	0
1977	0	0	0	0	0	0	0	5,024	0	0	0	0	0
1978	0	0	0	0	0	0	21,773	7,601	0	0	0	0	0
1979	0	0	0	0	0	0	5,663	17,766	0	0	0	0	0
1980	0	0	0	0	0	0	0	22,515	0	0	0	0	0
1981	0	0	0	0	0	0	7,844	14,037	0	0	0	0	0
1982	0	0	0	0	0	0	0	25,553	0	0	0	0	0
1983	0	0	0	0	0	0	0	3,491	0	0	0	0	0
1984	0	0	0	0	0	0	12,117	26,178	0	0	0	0	0
1985	0	0	0	0	0	0	0	67,711	0	0	0	0	0
1986	0	0	0	0	0	0	0	66,551	0	0	0	0	0
1987	0	0	0	0	0	0	5,609	40,374	0	0	0	0	0
1988	0	0	0	0	0	0	9,298	47,167	0	0	0	0	0
1989	0	0	0	0	0	0	5,504	57,114	0	0	0	0	0
1990	0	0	0	0	0	0	7,645	20,423	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	789	17,449	0	0	0	0	0
1993	5,504	0	0	0	0	0	12,798	88,157	0	0	0	0	0
1994	0	0	0	0	0	0	2,494	33,148	0	0	0	0	0
1995	0	0	0	0	0	0	8,751	110,685	0	0	0	0	3,500
1996	0	0	0	0	0	0	28,063	64,849	0	0	0	0	0
1997	1,486	0	0	0	0	0	43,803	49,312	0	0	0	0	0
1998	24,234	0	0	0	0	0	29,444	40,085	5,500	0	0	0	0
1999	62,162	0	0	0	0	0	12,969	92,998	0	0	0	0	0
2000	149,731	0	0	0	0	0	0	102,202	0	0	0	0	0
2001	0	0	0	0	0	1,733	0	33,925	0	0	0	0	0
2002	0	0	0	0	0	736	0	71,444	0	0	0	0	0
2003	45,989	0	0	0	0	350	2,396	124,582	1,865	0	0	0	0
2004	0	0	0	0	0	1,657	1,922	73,801	0	0	0	0	0
2005	15,384	0	2,619	2,321	0	14,540	21,781	269,631	192	0	0	9,014	0
2006	5,065	0	0	0	0	5,670	11,787	196,116	0	0	0	0	0
2007	0	0	0	0	0	2,161	0	72,240	0	0	0	0	0
2008	0	0	0	0	0	0	200	9,785	0	0	0	2,324	0
2009	0	0	0	0	0	0	0	12,060	0	0	0	0	0
2010	134,855	0	0	0	0	304	0	63,966	22,000	0	0	0	10,000
2011	109,787	8,066	706	2,331	3,420	34,733	4,896	273,275	25,845	4,452	2,548	0	0
2012	92,803	19,066	0	0	0	0	448	70,946	1,950	2,500	0	0	8,000
2013	0	0	0	0	0	0	0	14,189	0	0	0	0	0
2014	0	0	0	0	0	6,150	1,000	31,158	0	0	0	0	0
2015	0	0	0	0	0	0	735	39,274	0	0	0	0	0
2016	0	0	0	0	0	0	735	39,274	0	0	0	0	0
2017	0	0	0	0	0	0	735	39,274	0	0	0	0	0
2018	0	0	0	0	0	0	735	39,274	0	0	0	0	0
2019	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2020	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2021	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2022	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2023	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2024	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2025	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2026	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2027	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2028	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2029	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2030	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2031	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2032	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2033	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2034	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
2035	38,000	0	0	0	0	0	4,800	25,447	0	0	0	0	0
<b>TOTAL</b>	<b>1,293,000</b>	<b>27,132</b>	<b>3,325</b>	<b>4,652</b>	<b>3,420</b>	<b>68,034</b>	<b>365,736</b>	<b>2,978,939</b>	<b>57,352</b>	<b>6,952</b>	<b>2,548</b>	<b>11,338</b>	<b>21,500</b>

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 11 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 14A		Reach 14B		Reach 14C			Reach 15A		Reach 16A		
	KCWA		KCWA		KCWA		MWDSC	KCWA		AVEKWA	KCWA	
	(M&I)	(AG)	(M&I)	(AG)	(M&I)	(AG)		(M&I)	(AG)		(M&I)	(AG)
	[118]	[119]	[120]	[121]	[122]	[123]	[124]	[125]	[126]	[127]	[128]	[129]
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	3	0	0	0	0	0	0	0	0
1971	0	23,844	0	49,929	0	24,187	0	0	3,552	0	0	0
1972	0	26,621	0	77,034	0	35,016	0	0	6,064	0	0	4,768
1973	0	15,328	0	47,040	0	19,043	0	0	19,916	0	0	1,961
1974	0	7,794	0	32,356	0	12,601	0	0	18,000	0	3,000	1,564
1975	0	10,306	0	27,736	0	12,783	0	0	35,420	0	3,200	9,867
1976	0	268	0	35,296	0	9,005	0	0	39,551	0	3,500	11,667
1977	0	8,299	0	13,539	0	3,757	0	0	6,158	0	3,420	685
1978	0	34,029	0	72,351	0	24,542	0	0	31,148	0	7,989	1,655
1979	3,012	27,356	0	59,413	0	22,372	0	0	38,602	0	2,813	15,808
1980	4,312	16,876	0	40,513	0	19,953	0	0	37,817	0	2,700	16,145
1981	4,511	13,007	8	42,753	7	18,729	0	0	39,033	0	2,636	18,156
1982	3,735	24,240	184	57,739	0	26,479	0	0	47,782	0	1,921	16,577
1983	1,168	20,302	0	57,922	0	26,613	0	0	37,426	0	1,400	17,907
1984	137	35,369	10	79,179	2	34,996	0	0	49,848	0	1,338	24,246
1985	206	33,103	0	72,855	0	31,758	0	0	44,078	0	1,309	16,820
1986	180	26,384	0	70,864	0	34,566	0	0	42,461	0	1,213	15,559
1987	610	30,098	9	67,710	10	31,019	0	0	34,748	0	1,665	10,170
1988	622	32,778	19	75,968	1	37,165	0	16	41,978	0	1,925	8,987
1989	721	29,292	7	82,201	5	37,800	0	2	43,239	0	2,668	8,649
1990	673	26,800	13	81,076	9	34,174	0	6	36,347	0	2,819	8,608
1991	768	0	0	0	0	0	0	0	0	2,000	2,588	343
1992	673	16,238	464	41,143	0	18,084	0	0	24,243	0	2,087	8,275
1993	629	17,832	0	62,493	0	28,103	0	0	27,997	0	2,494	9,167
1994	2,513	16,760	3,000	54,011	1,000	22,624	0	0	29,511	0	3,011	13,877
1995	3	21,234	0	67,391	0	31,285	0	0	26,134	0	3,188	15,042
1996	0	26,978	0	85,936	0	38,879	0	0	36,186	0	2,573	18,142
1997	0	23,035	0	79,790	0	33,512	0	0	36,281	0	3,997	17,048
1998	0	15,706	0	58,132	0	23,097	0	0	28,712	0	3,751	17,032
1999	0	21,153	0	67,576	0	31,489	0	0	36,801	0	3,316	24,071
2000	0	19,264	0	70,585	0	33,716	0	0	40,063	0	3,015	20,919
2001	0	12,452	0	49,602	0	23,557	0	0	31,192	0	1,894	13,476
2002	0	11,161	0	52,762	0	27,138	0	0	41,552	0	4,227	14,520
2003	0	13,685	0	44,576	0	24,783	12,911	0	36,602	0	1,168	16,799
2004	0	13,030	0	52,012	0	30,313	0	0	40,184	0	2,239	19,714
2005	0	15,663	0	56,739	0	21,979	0	0	39,870	0	167	18,353
2006	0	17,779	0	65,142	1,413	20,193	5,440	0	46,244	0	279	22,570
2007	0	21,435	0	67,955	0	24,947	1,881	0	47,390	0	204	26,229
2008	0	20,087	0	63,497	0	27,847	0	0	33,029	0	3,834	18,426
2009	0	22,281	0	60,726	0	27,185	0	0	26,007	0	1,531	19,517
2010	0	21,964	0	58,110	0	25,477	29,818	0	22,045	0	1,033	19,829
2011	0	24,131	0	61,859	0	27,061	27,326	0	42,158	0	3,808	17,957
2012	0	25,982	0	64,489	0	23,446	31,703	0	27,920	0	3,453	19,842
2013	0	29,414	0	62,137	0	25,004	6,592	0	28,147	0	148	21,311
2014	0	53,611	2,000	56,307	0	54,488	20,000	0	48,280	0	2,730	51,124
2015	0	16,900	0	39,900	0	19,700	20,000	0	28,153	0	4,556	14,810
2016	0	16,900	0	39,900	0	19,700	20,000	0	28,153	0	4,556	14,810
2017	0	16,900	0	39,900	0	19,700	20,000	0	28,153	0	4,556	14,810
2018	0	16,900	0	39,900	0	19,700	20,000	0	28,153	0	4,556	14,810
2019	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2020	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2021	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2022	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2023	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2024	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2025	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2026	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2027	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2028	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2029	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2030	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2031	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2032	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2033	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2034	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
2035	0	16,900	0	40,900	0	19,700	0	0	27,153	0	6,966	13,600
TOTAL	24,473	1,277,869	5,714	3,401,347	2,447	1,554,465	215,671	24	2,023,929	2,000	238,897	943,822

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 12 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	TEHACHAPI DIVISION	MOJAVE DIVISION										
	Reach 17E	Reach 18A	Reach 19			Reach 20A			Reach 20B			Reach 21
	KCWA											
	(M&I)	AVEKWA	AVEKWA	MWA	AVEKWA	MWA	PWD	AVEKWA	LCID	PWD	AVEKWA	
	[130]	[131]	[132]	[133]	[134]	[135]	[136]	[137]	[138]	[139]	[140]	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	0	0	
1972	0	0	0	0	0	0	0	0	0	0	0	
1973	0	0	0	0	0	0	0	0	0	0	0	
1974	0	0	1,223	0	0	0	0	0	0	0	0	
1975	0	0	7,622	0	420	0	0	0	0	0	0	
1976	0	3,808	23,063	0	471	0	0	416	0	0	0	
1977	0	1,231	8,927	0	773	0	0	271	0	0	0	
1978	0	1,321	36,333	0	5,549	0	0	934	0	0	0	
1979	0	2,098	49,910	0	7,555	0	0	930	0	0	0	
1980	0	2,610	61,534	0	7,605	0	0	655	0	0	0	
1981	0	2,340	65,690	0	10,333	0	0	966	0	0	0	
1982	0	1,669	41,127	0	7,313	0	0	8	0	0	0	
1983	0	43	26,377	0	6,253	0	0	20	0	0	0	
1984	0	90	22,462	0	9,558	0	0	2	0	0	0	
1985	0	8	23,440	0	11,613	0	1,510	217	0	32	0	
1986	0	8	16,898	0	13,808	0	3,041	0	0	45	0	
1987	0	0	15,958	0	15,493	0	2,389	151	0	1,624	0	
1988	0	0	13,471	0	17,117	0	366	281	0	1,261	0	
1989	0	0	18,007	0	23,481	0	381	112	0	7,848	0	
1990	0	0	17,281	0	25,843	0	282	84	0	8,292	0	
1991	0	0	728	0	4,282	1,391	84	131	0	3,830	0	
1992	0	0	7,238	0	18,518	1,310	185	650	0	3,850	0	
1993	0	0	13,340	0	23,662	1,514	164	996	0	7,597	0	
1994	0	0	19,122	0	25,250	1,399	299	124	0	8,119	0	
1995	0	0	20,222	0	22,385	1,227	328	0	0	6,633	0	
1996	0	0	23,919	0	26,979	1,316	354	0	0	11,080	0	
1997	0	0	28,834	64	27,999	1,272	313	0	0	11,548	0	
1998	0	0	22,466	1,345	25,985	0	195	0	0	8,557	0	
1999	0	0	30,944	1,439	32,409	0	377	36	0	12,901	0	
2000	0	0	34,786	1,361	37,819	0	0	80	0	9,060	5,002	
2001	0	0	24,370	1,385	33,216	0	0	282	0	10,427	0	
2002	0	0	14,297	1,370	36,311	0	0	1,662	0	18,496	0	
2003	0	0	12,145	1,285	39,532	0	0	2,289	0	11,547	0	
2004	0	0	11,201	1,223	40,408	0	0	1,774	0	12,139	0	
2005	0	11	11,804	1,051	41,496	0	0	1,336	0	11,678	0	
2006	0	0	18,438	1,021	53,878	0	0	1,415	0	12,487	0	
2007	0	0	22,916	1,176	47,639	0	0	1,349	0	19,609	0	
2008	0	0	9,096	1,238	33,919	0	0	792	25	14,255	0	
2009	0	0	5,717	1,345	35,402	0	0	366	42	15,339	0	
2010	0	0	10,825	1,181	43,122	0	0	643	0	10,969	0	
2011	0	0	55,707	2,184	35,543	0	0	507	0	9,881	0	
2012	0	0	41,053	1,306	33,390	0	0	901	0	16,397	0	
2013	4	16	13,399	1,095	33,507	0	0	693	0	10,567	0	
2014	1	172	871	2,323	24,975	155	0	1,428	0	7,135	0	
<b>2015</b>	<b>120</b>	<b>3,444</b>	<b>16,703</b>	<b>2,833</b>	<b>62,131</b>	<b>0</b>	<b>0</b>	<b>1,829</b>	<b>0</b>	<b>12,780</b>	<b>0</b>	
2016	120	3,444	19,299	2,833	59,397	0	0	1,884	0	12,780	0	
2017	120	3,444	19,299	2,833	59,309	0	0	1,941	0	12,780	0	
2018	120	3,444	19,299	2,833	59,162	0	0	2,001	0	12,780	0	
2019	0	2,300	18,450	3,298	54,860	0	0	1,830	0	12,780	0	
2020	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2021	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2022	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2023	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2024	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2025	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2026	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2027	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2028	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2029	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2030	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2031	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2032	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2033	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2034	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
2035	0	2,300	18,450	898	54,860	0	0	1,830	0	12,780	0	
<b>TOTAL</b>	<b>485</b>	<b>68,301</b>	<b>1,291,011</b>	<b>52,390</b>	<b>2,113,430</b>	<b>9,584</b>	<b>10,268</b>	<b>61,266</b>	<b>67</b>	<b>551,583</b>	<b>5,002</b>	



**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 13 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION										
	Reach 21		Reach 22A		Reach 22B					Reach 23	Reach 24
	LCID	PWD	AVEKWA	LCID	AVEKWA (d)	CVWD (e)	DWA (e)	MWDSC (e)	MWA	MWA	CLAWA
[141]	[142]	[143]	[144]	[145]	[146]	[147]	[148]	[149]	[150]	[151]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	338	0	0	0	0	0	0	55	0	0	464
1973	290	0	0	0	0	5,800	9,000	(14,800)	0	0	389
1974	400	0	0	0	0	6,400	10,000	(16,400)	0	14	627
1975	520	0	0	0	0	7,000	11,000	(18,000)	0	0	825
1976	589	0	0	0	0	7,600	12,000	(19,600)	0	0	1,002
1977	111	0	0	0	0	0	0	22	58	0	1,109
1978	208	0	0	0	0	10,084	15,300	(25,384)	0	0	1,209
1979	133	0	0	0	0	10,063	15,000	(25,063)	4,000	0	1,260
1980	191	0	3	0	0	10,884	17,000	(27,884)	4,000	0	1,239
1981	1,270	0	46	0	0	12,105	19,000	(31,105)	4,000	0	1,485
1982	0	0	174	0	0	13,326	21,000	(34,326)	10,500	0	1,238
1983	38	0	268	0	0	14,547	23,000	(37,547)	0	0	911
1984	1	0	550	0	0	15,768	25,000	(40,768)	0	0	1,128
1985	0	16	1,786	0	0	16,989	27,000	(43,989)	0	0	1,422
1986	163	10	1,735	0	0	18,210	29,000	(47,210)	0	0	1,506
1987	1,080	1,366	2,273	5	214	19,431	31,500	(50,931)	17	0	1,849
1988	419	143	3,210	0	0	20,652	34,000	(54,652)	9	0	2,006
1989	971	780	3,591	0	89	21,873	36,500	(58,373)	0	200	2,170
1990	1,747	34	3,988	0	10	23,100	38,100	(61,200)	0	0	1,827
1991	522	0	2,427	0	0	6,930	11,430	(18,360)	0	0	849
1992	251	0	3,859	0	0	10,427	17,197	(27,624)	42	0	519
1993	734	0	5,098	0	0	0	0	0	0	0	439
1994	1,098	0	4,657	0	0	0	0	0	14,634	0	785
1995	480	0	4,679	0	0	0	0	0	7,495	0	409
1996	494	0	5,458	0	0	0	0	0	6,111	0	485
1997	444	0	5,549	0	0	0	0	0	9,038	0	651
1998	404	0	4,468	0	0	0	0	0	2,580	0	187
1999	342	0	5,684	0	0	0	0	0	6,705	0	1,132
2000	0	0	5,890	0	0	0	0	0	10,019	0	1,194
2001	0	0	4,989	0	0	0	0	0	3,048	0	1,057
2002	0	0	5,404	0	497	0	0	0	2,976	0	2,189
2003	0	0	6,063	0	0	0	0	7,625	13,150	0	1,563
2004	0	23	6,095	0	253	0	0	0	11,953	0	2,006
2005	0	34	5,184	0	0	0	0	5,942	12,169	0	807
2006	0	5	6,653	0	0	0	0	0	32,993	0	641
2007	0	25	7,711	0	588	0	0	0	27,684	0	1,768
2008	0	0	4,756	0	0	0	0	0	20,479	0	848
2009	0	0	4,185	0	0	0	0	0	20,214	0	894
2010	0	0	3,899	0	0	0	0	0	27,640	0	357
2011	0	0	2,289	0	0	0	0	30,907	2,915	0	474
2012	0	0	2,328	0	0	0	0	12,025	9,938	0	624
2013	0	0	3,227	0	114	0	0	0	5,888	0	1,368
2014	115	0	163	0	0	0	0	0	393	0	2,176
<b>2015</b>	<b>1,380</b>	<b>0</b>	<b>2,747</b>	<b>0</b>	<b>52</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18,612</b>	<b>0</b>	<b>3,480</b>
2016	1,380	0	2,830	0	52	0	0	0	20,612	0	3,480
2017	1,380	0	2,913	0	0	0	0	0	20,612	0	3,480
2018	1,380	0	3,000	0	0	0	0	0	20,612	0	3,480
2019	1,380	0	7,400	0	0	0	0	0	41,582	0	3,480
2020	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2021	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2022	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2023	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2024	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2025	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2026	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2027	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2028	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2029	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2030	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2031	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2032	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2033	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2034	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
2035	1,380	0	7,400	0	0	0	0	0	43,982	0	3,480
<b>TOTAL</b>	<b>42,333</b>	<b>2,436</b>	<b>265,629</b>	<b>5</b>	<b>1,869</b>	<b>251,189</b>	<b>402,027</b>	<b>(596,717)</b>	<b>1,096,409</b>	<b>272</b>	<b>120,168</b>

(d) 1988 advance allocation.

(e) In accordance with the Exchange Agreement between the noted agencies, MWDSC assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert Water Agency and Coachella Valley Water District for such costs from the Delta through Reach 22B. The adjustment in deliveries in Reach 22B provides for compliance with provisions for the repayment of costs under the agreement. In 1993 and after, the exchange takes place in Reach 26A.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 14 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION (cont)					SANTA ANA DIVISION					
	Reach 24			Reach 26A			Reach 28G	Reach 28H			
	MWDSC (e)	MWA	SBVMWD	CVWD(e)	DWA(e)	MWDSC (e)	SBVMWD (f)	SGVMWD	MWDSC	CVWD	DWA
[152]	[153]	[154]	[155]	[156]	[157]	[158]	[159]	[160]	[161]	[162]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	1,275	0	0	0	0
1973	0	0	0	0	0	444	32,426	0	18,942	0	0
1974	0	0	0	0	0	84,981	16,605	612	0	0	0
1975	0	0	0	0	0	169,960	13,865	5,450	0	0	0
1976	0	0	0	0	0	215,312	12,273	6,071	0	0	0
1977	0	0	0	0	0	64,823	24,833	8,996	0	0	0
1978	0	0	0	0	0	297,708	4,055	7,771	0	0	0
1979	0	0	0	0	0	260,903	18	290	0	0	0
1980	0	0	0	0	0	300,345	0	1,085	0	0	0
1981	0	0	0	0	0	395,678	16,021	3,619	0	0	0
1982	0	0	0	0	0	214,566	8,409	12,599	0	0	0
1983	0	0	0	0	0	175,288	5,994	734	0	0	0
1984	0	0	0	0	0	122,311	5,556	7,656	0	0	0
1985	0	0	0	0	0	147,599	7,390	5,028	0	0	0
1986	0	0	0	0	0	215,265	6,421	9,454	0	0	0
1987	0	0	0	0	0	175,012	18,751	10,630	0	0	0
1988	0	0	0	0	0	247,101	21,386	8,948	0	0	0
1989	0	0	0	0	0	326,217	20,782	12,839	0	0	0
1990	0	0	0	0	0	399,387	18,831	16,649	0	0	0
1991	0	2,032	0	0	0	107,182	3,661	5,399	0	0	0
1992	0	9,334	0	0	0	219,524	3,358	7,908	0	0	0
1993	0	10,000	0	23,100	38,100	98,291	4,361	14,397	0	0	0
1994	0	819	0	14,102	23,257	192,979	9,135	15,230	0	0	0
1995	0	0	0	23,100	38,100	107,299	696	12,922	0	0	0
1996	0	0	0	62,219	102,622	73,438	6,064	15,989	0	0	0
1997	0	0	0	58,100	53,100	157,215	9,654	18,175	0	0	0
1998	0	0	0	78,100	58,100	36,770	1,878	9,310	0	6,582	7,708
1999	0	0	0	50,480	58,100	139,752	12,874	21,729	0	0	0
2000	0	0	0	42,323	58,234	326,647	0	15,140	0	0	0
2001	0	0	0	9,100	15,010	284,007	0	2,360	0	0	0
2002	0	0	0	16,755	27,640	301,700	26,399	24,851	0	0	0
2003	17,249	0	0	14,443	23,819	464,719	5,000	21,934	0	0	0
2004	0	0	0	15,465	21,190	428,316	40,000	12,541	0	0	0
2005	14,058	341	0	34,356	49,089	361,976	15,834	13,984	0	0	0
2006	0	0	0	121,100	50,000	404,594	20,000	16,284	0	0	0
2007	0	17,249	710	66,007	27,253	370,971	10,022	4,024	0	7,221	2,981
2008	0	3,679	411	40,171	24,643	210,520	187	7,212	0	6,620	1,785
2009	0	7,488	149	45,074	17,872	138,216	0	11,520	0	948	391
2010	0	9,331	26	53,866	18,398	463,654	20,008	19,180	0	30,415	12,257
2011	14,141	0	31	84,566	34,076	610,454	368	23,591	0	5,713	2,303
2012	2,994	0	0	98,793	33,806	362,047	50,723	22,058	0	16,575	8,266
2013	0	500	0	33,551	17,611	234,576	1,120	9,252	0	28,232	3,180
2014	0	0	0	12,750	2,989	138,786	0	1,200	0	0	0
2015	0	5,000	50	42,989	30,758	473,009	0	17,280	0	40,021	2,692
2016	0	5,000	50	42,989	30,758	473,009	0	17,280	0	40,021	2,692
2017	0	7,000	50	42,989	30,758	473,009	0	17,280	0	40,021	2,692
2018	0	7,000	50	42,989	30,758	473,009	0	17,280	0	40,021	2,692
2019	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2020	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2021	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2022	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2023	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2024	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2025	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2026	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2027	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2028	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2029	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2030	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2031	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2032	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2033	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2034	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
2035	0	9,000	260	83,010	33,450	465,085	0	17,280	0	0	0
TOTAL	48,442	237,773	5,947	2,580,647	1,484,691	19,845,014	476,233	807,501	18,942	262,390	49,639

(e) In accordance with the Exchange Agreement between the noted agencies, MWDSC assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert Water Agency and Coachella Valley Water District for such costs from the Delta through Reach 22B. The adjustment in deliveries in Reach 22B provides for compliance with provisions for the repayment of costs under the agreement. In 1993 and after, the exchange takes place in Reach 26A.

(f) Includes 1,650 AF recaptured from ground water storage in 1982, 10,000 AF in 1987, and 8,749 AF in 1988. This water was stored under DWR's Ground Water Demonstration Program.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 15 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)									
	Reach 28H	Reach 28J			Reach EBX1			Reach EBX2C	Reach EBX3A	
	MWDSC	CVWD	DWA	MWDSC	CVWD	MWDSC	SBVMWD	SBVMWD	SBVMWD	
[163]	[164]	[165]	[166]	[167]	[168]	[169]	[170]	[171]		
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	251	0	0	0	0	0	0
1976	55	0	0	2,000	0	0	0	0	0	0
1977	43	0	0	2,442	0	0	0	0	0	0
1978	48	0	0	64,054	0	0	0	0	0	0
1979	1,290	0	0	94,353	0	0	0	0	0	0
1980	3,013	0	0	91,532	0	0	0	0	0	0
1981	4,365	0	0	149,405	0	0	0	0	0	0
1982	3,961	0	0	155,629	0	0	0	0	0	0
1983	6,645	0	0	41,616	0	0	0	0	0	0
1984	109,743	0	0	5,672	0	0	0	0	0	0
1985	182,781	0	0	6,538	0	0	0	0	0	0
1986	131,439	0	0	30,071	0	0	0	0	0	0
1987	144,743	0	0	26,315	0	0	0	0	0	0
1988	199,641	0	0	22,209	0	0	0	0	0	0
1989	247,430	0	0	51,462	0	0	0	0	0	0
1990	257,796	0	0	36,060	0	0	0	0	0	0
1991	38,832	0	0	5,958	0	0	0	0	0	0
1992	85,341	0	0	12,223	0	0	0	0	0	0
1993	61,841	0	0	4,588	0	0	0	0	0	0
1994	134,262	0	0	4,725	0	0	0	0	0	0
1995	117,762	0	0	21,099	0	0	0	0	0	0
1996	144,906	0	0	12,418	0	0	0	0	0	0
1997	107,853	0	0	47,777	0	0	0	0	0	0
1998	77,473	1,027	4,839	50,411	0	0	0	0	0	0
1999	206,689	0	0	8,163	0	0	0	0	0	0
2000	379,713	0	0	7,864	0	5,466	18,399	0	0	0
2001	260,984	0	0	33,414	0	0	26,488	0	0	0
2002	340,635	0	0	41,552	0	1,427	37,069	0	0	0
2003	246,485	0	0	50,776	0	74,496	16,703	1,793	2,617	2,617
2004	357,995	0	0	20,437	0	120,338	13,229	1,430	2,371	2,371
2005	242,245	0	0	114,499	8,163	153,700	12,715	966	2,035	2,035
2006	342,734	0	0	32,242	0	147,432	11,832	885	2,614	2,614
2007	271,874	0	0	48,923	0	94,208	38,151	3,130	5,103	5,103
2008	175,460	0	0	10,432	0	16,745	25,038	686	8,823	8,823
2009	126,265	0	0	5,849	0	18,314	25,041	4,090	10,066	10,066
2010	129,145	1,311	528	65,439	0	0	19,190	617	9,538	9,538
2011	213,215	0	0	51,638	0	0	19,578	699	9,384	9,384
2012	86,266	2,219	3,029	36,875	0	0	27,534	3,177	9,604	9,604
2013	45,039	4,756	0	40,494	0	0	19,850	3,034	8,081	8,081
2014	1,091	0	0	0	0	0	12,972	111	3,899	3,899
<b>2015</b>	<b>23,305</b>	<b>0</b>	<b>0</b>	<b>21,170</b>	<b>0</b>	<b>0</b>	<b>61,510</b>	<b>0</b>	<b>0</b>	<b>0</b>
2016	23,305	0	0	21,170	0	0	61,510	0	0	0
2017	23,305	0	0	21,170	0	0	61,510	0	0	0
2018	23,305	0	0	21,170	0	0	61,510	0	0	0
2019	69,282	0	0	58,345	0	0	61,300	0	0	0
2020	69,282	0	0	58,345	0	0	61,300	0	0	0
2021	69,282	0	0	58,345	0	0	61,300	0	0	0
2022	69,282	0	0	58,345	0	0	61,300	0	0	0
2023	69,282	0	0	58,345	0	0	61,300	0	0	0
2024	69,282	0	0	58,345	0	0	61,300	0	0	0
2025	69,282	0	0	58,345	0	0	61,300	0	0	0
2026	69,282	0	0	58,345	0	0	61,300	0	0	0
2027	69,282	0	0	58,345	0	0	61,300	0	0	0
2028	69,282	0	0	58,345	0	0	61,300	0	0	0
2029	69,282	0	0	58,345	0	0	61,300	0	0	0
2030	69,282	0	0	58,345	0	0	61,300	0	0	0
2031	69,282	0	0	58,345	0	0	61,300	0	0	0
2032	69,282	0	0	58,345	0	0	61,300	0	0	0
2033	69,282	0	0	58,345	0	0	61,300	0	0	0
2034	69,282	0	0	58,345	0	0	61,300	0	0	0
2035	69,282	0	0	58,345	0	0	61,300	0	0	0
<b>TOTAL</b>	<b>6,758,112</b>	<b>9,313</b>	<b>8,396</b>	<b>2,583,950</b>	<b>8,163</b>	<b>632,126</b>	<b>1,611,929</b>	<b>20,618</b>	<b>74,135</b>	<b>74,135</b>

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 16 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	SANTA ANA DIVISION (continued)			WEST BRANCH							
	Reach EBX4B-G	Reach EBX4B	Reach 29F	Reach 29H			Reach 30				
	SGPWA	SGPWA	AVEKWA	CLWA	VCFC	CLWA	CVWD	DWA	MWDSC (g)	MWA	SBVMWD
[172]	[173]	[174]	[175]	[176]	[177]	[178]	[179]	[180]	[181]	[182]	
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	53	0	0	0	0	0	71,938	0	0
1973	0	0	20	0	0	0	0	0	155,297	0	0
1974	0	0	36	0	0	0	0	0	209,136	0	0
1975	0	0	26	0	0	0	0	0	374,280	0	0
1976	0	0	24	0	0	0	0	0	420,684	0	0
1977	0	0	0	0	0	0	0	0	122,447	0	0
1978	0	0	0	0	0	0	0	0	171,139	0	0
1979	0	0	0	0	0	7	0	0	145,591	0	0
1980	0	0	0	0	0	1,210	0	0	164,721	0	0
1981	0	0	0	0	0	5,761	0	0	277,503	0	0
1982	0	0	0	0	0	9,516	0	0	351,362	0	0
1983	0	0	0	0	0	9,476	0	0	157,519	0	0
1984	0	0	0	0	0	11,477	0	0	260,624	0	0
1985	0	0	0	0	0	12,401	0	0	390,696	0	0
1986	0	0	0	0	0	13,928	0	0	379,275	0	0
1987	0	0	0	0	0	16,167	0	0	417,285	0	0
1988	0	0	0	0	0	18,904	0	0	488,265	0	0
1989	0	0	0	0	0	21,719	0	0	589,962	0	0
1990	0	0	0	0	4,836	22,139	0	0	764,380	0	0
1991	0	0	0	0	988	3,846	0	0	257,835	0	0
1992	0	0	0	0	0	14,812	0	0	420,849	0	0
1993	0	0	6	0	0	13,787	0	0	437,470	0	0
1994	0	0	0	0	0	14,919	0	0	475,900	0	0
1995	0	0	0	0	0	17,747	0	0	139,882	0	0
1996	0	0	0	0	0	18,448	0	0	267,618	0	0
1997	0	0	11	0	0	22,842	10,240	16,890	271,379	0	0
1998	0	0	7	0	0	19,782	0	0	187,277	0	0
1999	0	0	0	0	0	28,813	0	0	327,001	0	0
2000	0	0	0	0	2,200	31,085	0	0	632,991	0	0
2001	0	0	0	0	0	30,701	0	0	444,764	0	0
2002	0	0	0	0	3,148	42,080	0	0	723,605	0	8,601
2003	0	116	0	6,768	3,150	44,967	0	0	678,964	0	0
2004	0	841	0	0	4,047	47,463	0	0	797,294	0	0
2005	0	692	0	0	0	36,747	0	0	538,839	0	0
2006	3,471	807	0	0	0	40,017	0	0	574,679	0	0
2007	3,758	177	0	0	1,890	45,919	0	0	711,831	0	0
2008	3,863	1,042	0	0	1,980	42,878	0	0	485,156	0	0
2009	4,499	1,898	0	0	3,150	38,784	0	0	589,294	0	0
2010	2,555	5,685	0	0	3,150	31,288	0	0	376,877	0	0
2011	1,213	9,290	0	0	2,520	31,445	0	0	375,921	0	0
2012	0	11,010	24	0	3,150	36,153	0	0	553,244	0	0
2013	0	9,445	47	0	2,242	44,126	0	0	565,849	0	0
2014	0	5,627	0	0	907	36,737	0	0	324,478	0	0
<b>2015</b>	<b>3,760</b>	<b>6,620</b>	<b>0</b>	<b>0</b>	<b>1,890</b>	<b>55,120</b>	<b>0</b>	<b>0</b>	<b>600,985</b>	<b>23,235</b>	<b>0</b>
2016	940	9,440	0	0	1,890	55,120	0	0	600,985	21,235	0
2017	320	10,060	0	0	1,890	55,120	0	0	600,985	19,235	0
2018	0	10,380	0	0	1,890	55,120	0	0	600,985	19,235	0
2019	680	9,700	0	0	1,890	39,200	0	0	516,188	0	0
2020	680	9,700	0	0	1,890	39,500	0	0	516,188	0	0
2021	680	9,700	0	0	1,890	40,300	0	0	516,188	0	0
2022	680	9,700	0	0	1,890	41,200	0	0	516,188	0	0
2023	680	9,700	0	0	1,890	42,000	0	0	516,188	0	0
2024	680	9,700	0	0	1,890	42,900	0	0	516,188	0	0
2025	680	9,700	0	0	1,890	43,700	0	0	516,188	0	0
2026	680	9,700	0	0	1,890	44,200	0	0	516,188	0	0
2027	680	9,700	0	0	1,890	44,800	0	0	516,188	0	0
2028	680	9,700	0	0	1,890	45,300	0	0	516,188	0	0
2029	680	9,700	0	0	1,890	46,000	0	0	516,188	0	0
2030	680	9,700	0	0	1,890	46,600	0	0	516,188	0	0
2031	680	9,700	0	0	1,890	47,500	0	0	516,188	0	0
2032	680	9,700	0	0	1,890	48,300	0	0	516,188	0	0
2033	680	9,700	0	0	1,890	49,100	0	0	516,188	0	0
2034	680	9,700	0	0	1,890	49,900	0	0	516,188	0	0
2035	680	9,700	0	0	1,890	50,700	0	0	516,188	0	0
<b>TOTAL</b>	<b>35,939</b>	<b>248,030</b>	<b>254</b>	<b>6,768</b>	<b>77,048</b>	<b>1,859,771</b>	<b>10,240</b>	<b>16,890</b>	<b>28,250,237</b>	<b>82,940</b>	<b>8,601</b>

(g) Deliveries exclude 6,171 AF of 1982 exchange water.

**TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 17 of 17

Calendar Year	CALIFORNIA AQUEDUCT (continued)											TOTAL	GRAND TOTAL
	WEST BRANCH (continued)			COASTAL BRANCH									
	Reach 30		Reach 31A					Reach 33A					
	SBC FC&WCD	VCFCFD	AVEKWA	CLWA	DRWD	KCWA		CK	SLOC FC&WCD	SBC FC&WCD			
(M&I)						(AG)							
	[183]	[184]	[185]	[186]	[187]	[188]	[189]	[190]	[191]	[192]	[193]	[194]	
1962	0	0	0	0	0	0	0	0	0	0	0	8,906	
1963	0	0	0	0	0	0	0	0	0	0	0	12,645	
1964	0	0	0	0	0	0	0	0	0	0	0	20,911	
1965	0	0	0	0	0	0	0	0	0	0	0	34,026	
1966	0	0	0	0	0	0	0	0	0	0	0	54,913	
1967	0	0	0	0	0	0	0	0	0	0	0	56,763	
1968	0	0	0	7,382	0	0	71,657	0	0	0	192,188	294,457	
1969	0	0	0	9,970	0	0	52,094	0	0	0	195,705	268,104	
1970	0	0	0	11,739	0	0	71,910	0	0	0	276,211	369,459	
1971	0	0	0	12,490	0	0	98,481	0	0	0	553,081	654,442	
1972	0	0	0	13,905	0	0	107,850	0	0	0	895,006	1,037,770	
1973	0	0	0	9,418	0	0	69,227	0	0	0	638,930	737,532	
1974	0	0	0	9,700	0	0	68,474	0	0	0	783,984	878,947	
1975	0	0	0	10,700	0	0	74,516	0	0	0	1,129,728	1,230,830	
1976	0	0	0	11,700	0	0	78,358	0	0	0	1,245,662	1,380,124	
1977	0	0	0	5,075	0	0	35,504	0	0	0	465,442	582,381	
1978	0	0	0	11,362	0	0	81,242	0	0	0	1,339,268	1,458,733	
1979	0	0	0	19,138	0	0	104,017	0	0	0	1,537,705	1,666,457	
1980	0	0	0	13,882	0	0	97,497	0	0	0	1,413,363	1,536,456	
1981	0	0	0	12,700	0	0	97,054	0	0	0	1,779,479	1,918,563	
1982	0	0	0	12,700	0	0	83,076	0	0	0	1,641,571	1,750,862	
1983	0	0	0	12,659	0	0	87,859	0	0	0	1,089,626	1,187,156	
1984	0	0	0	12,741	0	0	119,098	0	0	0	1,489,814	1,591,416	
1985	0	0	0	12,099	0	0	110,124	0	0	0	1,863,544	1,990,295	
1986	0	0	0	13,301	0	0	118,298	0	0	0	1,882,290	1,999,155	
1987	0	0	0	11,821	0	0	116,259	0	0	0	1,984,570	2,131,608	
1988	0	0	0	11,534	0	0	109,435	0	0	0	2,221,538	2,385,122	
1989	0	0	0	14,645	0	0	102,156	0	0	0	2,686,838	2,853,747	
1990	0	0	0	6,440	0	0	103,362	0	0	0	2,398,121	2,582,151	
1991	1,240	0	0	716	0	0	780	0	0	0	489,489	549,113	
1992	0	0	0	5,887	0	0	73,748	0	0	0	1,374,775	1,471,454	
1993	0	0	0	4,157	0	0	90,764	0	0	0	2,173,352	2,315,235	
1994	0	0	0	9,422	0	200	77,536	0	0	0	1,727,504	1,861,976	
1995	0	0	0	9,486	0	0	85,050	0	0	0	1,926,835	2,031,423	
1996	0	0	0	14,052	0	0	100,578	0	0	0	2,429,928	2,543,472	
1997	0	1,850	0	4,870	0	0	97,020	0	1,099	7,439	2,263,966	2,405,444	
1998	0	1,850	0	311	0	0	86,879	0	3,592	18,618	1,657,381	1,764,963	
1999	0	1,850	0	4,086	0	0	92,095	0	3,743	20,137	2,755,025	2,898,961	
2000	0	1,850	0	8,395	0	0	85,215	0	3,962	22,741	3,390,079	3,569,072	
2001	0	1,850	0	1,238	0	0	63,448	0	4,283	18,946	2,034,350	2,175,194	
2002	0	1,850	0	2,737	0	0	65,055	0	4,355	27,636	2,738,943	2,909,555	
2003	0	1,850	0	4,001	0	0	65,691	0	4,453	26,968	3,151,625	3,327,811	
2004	0	1,203	0	3,776	0	0	66,498	0	4,165	29,705	3,050,652	3,230,590	
2005	0	1,665	0	2,709	4,684	0	68,190	0	4,251	23,344	3,597,829	3,753,874	
2006	0	1,850	0	2,735	0	0	85,214	0	4,209	23,275	3,526,551	3,693,938	
2007	0	1,110	0	6,071	0	0	93,954	49	3,776	27,740	3,088,763	3,284,475	
2008	0	1,818	0	0	0	17,059	68,385	0	3,402	18,393	1,978,428	2,152,219	
2009	0	741	0	1	0	0	83,255	0	3,801	15,452	2,059,805	2,221,501	
2010	0	925	0	768	2,967	0	81,047	276	3,757	17,775	2,690,242	2,832,658	
2011	0	1,480	0	1,746	200	0	86,594	238	3,819	21,050	3,508,859	3,664,607	
2012	0	1,203	33,511	2,404	0	0	50,050	0	3,944	19,474	2,730,710	2,886,168	
2013	0	648	0	6,128	0	0	82,887	0	3,681	18,018	2,023,206	2,224,856	
2014	0	93	0	0	0	0	57,745	15	7,417	14,817	1,340,185	1,493,780	
2015	0	1,110	0	2,000	0	0	55,260	183	13,580	27,292	2,287,506	2,479,558	
2016	0	1,110	0	2,000	0	0	55,260	183	13,580	27,292	2,284,308	2,479,618	
2017	0	1,110	0	2,000	0	0	55,260	183	13,580	27,292	2,284,308	2,479,618	
2018	0	1,110	0	2,000	0	0	55,260	183	13,580	27,292	2,284,308	2,479,618	
2019	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,330	
2020	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,390	
2021	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,455	
2022	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,526	
2023	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2024	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2025	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2026	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2027	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2028	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2029	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2030	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2031	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2032	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2033	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2034	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,605	
2035	0	7,110	0	4,000	0	0	55,260	183	12,373	27,292	2,294,525	2,483,687	
<b>TOTAL</b>	<b>1,240</b>	<b>150,996</b>	<b>33,511</b>	<b>438,797</b>	<b>7,851</b>	<b>17,259</b>	<b>5,025,686</b>	<b>4,421</b>	<b>336,370</b>	<b>944,660</b>	<b>135,558,871</b>	<b>146,075,330</b>	



## Tables B-5A-Adj through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Deliverer  
from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 1 of 4

Calendar Year	CALIFORNIA AQUEDUCT												
	SAN LUIS DIVISION												
	Reach 1	Reach 3A											
	SCVWD	AVEK	CLWA	CLAWA	DRWD	KCWA (AG)	MWDSC	MWA	PWD	SBVMWD	SGVMWD	SGPWD	SLOC FC&WCD
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	(11,135)	0	0	0	0	0	0	0
2001	0	0	0	0	0	(11,487)	0	0	0	0	0	0	0
2002	0	0	0	0	0	(9,332)	0	0	0	0	0	0	0
2003	0	0	0	0	0	(18,428)	0	0	0	0	0	0	0
2004	0	0	0	0	0	(866)	0	0	0	0	0	0	0
2005	0	0	0	0	(576)	(20,082)	0	0	0	0	0	0	0
2006	0	0	0	0	0	(20,239)	0	0	0	0	0	0	0
2007	0	0	0	0	0	(9,867)	0	0	0	0	0	0	0
2008	(8,885)	0	0	0	0	(99,439)	0	0	0	0	0	0	0
2009	0	(5,926)	(38)	(1)	(28)	(82,636)	(815)	(5)	(15)	(21)	(4)	(4)	(2)
2010	0	0	(3,300)	0	0	(87,370)	(177,476)	0	0	0	0	0	0
2011	0	0	0	0	0	(56,909)	(106,423)	0	0	0	0	0	0
2012	0	0	0	0	(6,068)	(60,762)	0	0	0	0	0	0	0
2013	0	0	0	0	0	(11,846)	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(8,885)	(5,926)	(3,338)	(1)	(6,672)	(500,398)	(284,714)	(5)	(15)	(21)	(4)	(4)	(2)

**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Deliverer  
from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 2 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)						SOUTH SAN JOAQUIN DIVISION					
	Reach 3A				Reach 4		Reach 7		Reach 10A			
	SBC FC&WCD	SCVWD	TLBWS	VCFCD	KCWA (AG)	TLBWS	KCWA (AG)	TLBWS	AC FC&WCD	ACWD	CLWA	DWA
[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	(12,806)	0	(24,167)	(2,981)	0	0	0	0
2001	0	0	0	0	0	0	0	(25,164)	(1,807)	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	(4,000)	0	0	(6,020)	0	0	0	0	0	0
2005	0	(20,000)	(277)	0	0	0	0	0	0	0	0	0
2006	0	(53,573)	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	(5,000)	0	0	0
2008	0	(3,681)	0	0	0	0	0	(7,000)	(10,000)	0	(4,864)	0
2009	(19)	(1,000)	(49)	(1)	0	0	0	0	(3,083)	(4,950)	0	0
2010	0	(44,668)	(17,551)	0	0	0	0	0	0	0	0	0
2011	0	(49,579)	(11,096)	0	0	0	0	0	0	0	0	0
2012	0	0	(9,366)	0	0	0	0	0	0	0	0	0
2013	0	0	(6,054)	0	0	0	0	(4,000)	(4,000)	0	0	0
2014	0	0	0	0	0	0	0	(1,500)	(412)	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	(19)	(172,501)	(48,393)	(1)	(12,806)	(6,020)	(24,167)	(28,145)	(14,307)	(22,495)	(4,950)	(4,864)

**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Deliverer  
from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 3 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)														
	SOUTH SAN JOAQUIN DIVISION (continued)														
	Reach 10A			Reach 12E									Reach 13B		
	KCWA (AG)	MWDSC	SCVWD	AVEK	CLWA	CVWD	DWA	KCWA (AG)	MWDSC	SBVMWD	SCVWD	DRWD	KCWA (AG)	MWDSC	SCVWD
[26]	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1972	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1973	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1974	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1975	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1976	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1977	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1979	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1981	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1984	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1985	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1989	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1990	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1996	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2001	(1,813)	(31,500)	(30,000)	0	0	0	0	0	(20,800)	0	0	0	(132,228)	0	
2002	0	0	0	0	0	0	0	(14,638)	0	0	0	(22,161)	0	0	
2003	0	(10,000)	0	0	0	0	0	(5,170)	(5,073)	0	0	(15,316)	(24,523)	0	
2004	(3)	(93,555)	0	0	0	0	0	0	(17,765)	0	0	(43,985)	(4,813)	0	
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2007	(12,469)	(93,986)	(20,000)	0	(11,000)	0	0	(16,618)	(5,000)	0	0	(257,750)	0	0	
2008	0	(99,024)	(10,000)	(8,393)	(11,000)	(3,000)	(3,486)	(103,683)	(8,402)	0	0	(228,579)	(25,721)	0	
2009	(7,733)	(65,499)	(27,319)	(6,393)	(11,000)	(3,000)	0	(105,145)	(14,516)	0	(6,134)	(186,044)	0	0	
2010	(56)	0	0	0	(2,750)	(8,393)	0	(43,833)	(52,413)	0	0	(59,451)	0	0	
2011	0	0	0	0	0	0	0	(14,223)	(23,419)	0	0	(29,041)	0	0	
2012	0	0	(17,000)	0	0	(4,000)	0	(12,815)	0	0	(6,068)	(103,364)	0	0	
2013	(24,626)	(37,544)	(27,308)	0	0	(16,500)	0	(34,355)	(31,478)	(1,500)	0	(160,286)	(1,033)	(17,692)	
2014	(66,012)	(37,688)	0	0	(9,198)	(2,500)	0	(108,192)	(19,298)	0	0	(6,350)	(199,428)	(149)	
2015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	(112,712)	(468,796)	(131,627)	(14,786)	(44,948)	(37,393)	(3,486)	(458,672)	(198,164)	(1,500)	(6,134)	(12,418)	(1,437,633)	(56,239)	(17,692)

**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor**

(in acre-feet)

Sheet 4 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)												GRAND TOTAL
	SOUTH SAN JOAQUIN DIVISION (continued)						MOJAVE DIVISION					SANTA ANA DIVISION	
	Reach 13B	Reach 14B	Reach 14C		Reach 15A	Reach 16A	Reach 19	Reach 22A	Reach 22B		Reach 24	Reach EBX2C	
	PWD	KCWA (AG)	KCWA (AG)	MWDSC	KCWA (AG)	KCWA (AG)	AVEK	AVEK	AVEK	MWDSC	MWDSC	SBVMWD	
[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]	[49]	[50]	[51]	[52]	[53]	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0	0	0	0	0	(51,089)
2001	0	(396)	(242)	0	0	0	0	(152)	0	0	0	0	(255,589)
2002	0	0	0	0	0	0	0	0	0	0	0	0	(46,131)
2003	0	0	0	(12,380)	0	0	0	0	0	0	0	0	(90,890)
2004	0	0	0	(25,512)	0	0	0	0	0	0	0	(844)	(197,363)
2005	0	0	0	0	0	0	0	0	0	0	0	(7)	(40,942)
2006	0	0	0	0	0	0	0	0	0	0	0	(2)	(73,814)
2007	(4,926)	0	0	(24,225)	0	0	0	0	(8,751)	(17,249)	0	0	(486,841)
2008	0	0	0	(37,602)	0	0	0	0	(4,816)	(3,679)	(6)	0	(681,260)
2009	0	(1,706)	(5,168)	(54,948)	(2,788)	(444)	0	0	0	(7,488)	(11)	0	(603,933)
2010	0	(1,867)	(4,761)	(32,758)	(2,913)	0	0	0	0	(2,891)	0	0	(542,451)
2011	0	0	0	(16,065)	0	0	0	0	0	0	0	0	(306,755)
2012	0	(73)	(744)	(10,010)	(405)	0	0	0	0	0	0	0	(230,675)
2013	0	(264)	(4,691)	(33,205)	(406)	0	0	0	0	0	0	0	(416,788)
2014	0	(1,175)	(17,925)	(41,955)	(1,706)	(9,256)	(1,440)	0	0	0	0	0	(524,184)
<b>2015</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>(4,926)</b>	<b>(5,481)</b>	<b>(33,531)</b>	<b>(288,660)</b>	<b>(8,218)</b>	<b>(444)</b>	<b>(9,256)</b>	<b>(1,440)</b>	<b>(152)</b>	<b>(13,567)</b>	<b>(31,307)</b>	<b>(870)</b>	<b>(4,548,705)</b>



**TABLE B-5B Annual Water Quantities Delivered to Each Contractor**

(in acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA (a)				CENTRAL COASTAL AREA		
	Napa (b) County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1962	0	0	0	494	8,412	0	8,906	0	0	0
1963	0	0	0	1,731	10,914	0	12,645	0	0	0
1964	0	0	0	1,673	19,238	0	20,911	0	0	0
1965	0	0	0	2,605	16,407	15,014	34,026	0	0	0
1966	0	0	0	5,511	14,864	34,538	54,913	0	0	0
1967	0	0	0	4,780	12,882	39,101	56,763	0	0	0
1968	1,214	0	1,214	6,133	24,817	70,105	101,055	0	0	0
1969	2,687	0	2,687	6,635	813	62,264	69,712	0	0	0
1970	3,618	0	3,618	9,249	0	80,311	89,560	0	0	0
1971	2,521	0	2,521	5,017	5,961	87,606	98,584	0	0	0
1972	3,647	0	3,647	10,489	27,671	100,266	138,426	0	0	0
1973	3,792	0	3,792	2,975	2,521	88,582	94,078	0	0	0
1974	4,870	0	4,870	1,314	4	88,000	89,318	0	0	0
1975	6,840	0	6,840	4,618	986	88,000	93,604	0	0	0
1976	7,122	0	7,122	17,131	21,300	88,000	126,431	0	0	0
1977	8,226	0	8,226	12,644	18,840	76,220	107,704	0	0	0
1978	6,034	0	6,034	10,984	5,863	95,727	112,574	0	0	0
1979	6,561	0	6,561	19,325	10,874	91,991	122,190	0	0	0
1980	6,707	0	6,707	16,790	11,034	88,000	115,824	0	0	0
1981	9,001	0	9,001	19,590	21,917	88,000	129,507	0	0	0
1982	1,213	0	1,213	13,123	6,316	88,000	107,439	0	0	0
1983	2,287	0	2,287	4,766	3,157	86,733	94,656	0	0	0
1984	2,923	0	2,923	6,784	3,338	88,000	98,122	0	0	0
1985	4,039	0	4,039	15,072	19,016	88,000	122,088	0	0	0
1986	3,519	1,400	4,919	10,609	12,379	88,000	110,988	0	0	0
1987	7,693	1,550	9,243	23,406	25,390	88,000	136,796	0	0	0
1988	5,392	9,726	15,118	25,830	33,464	87,961	147,255	0	0	0
1989	6,195	17,256	23,451	26,227	26,042	90,000	142,269	0	0	0
1990	6,940	19,131	26,071	33,034	31,703	92,000	156,737	0	0	0
1991	1,380	6,972	8,352	9,411	12,648	28,200	50,259	0	1,240	1,240
1992	4,001	14,773	18,774	14,669	19,153	42,839	76,661	0	0	0
1993	5,286	29,180	34,466	33,635	10,271	62,065	105,971	0	0	0
1994	6,792	25,256	32,048	20,542	22,911	57,115	100,568	0	0	0
1995	5,182	21,345	26,527	30,091	17,793	28,756	76,640	0	0	0
1996	4,893	29,999	34,892	18,903	19,662	89,850	128,415	100	0	100
1997	4,341	33,530	37,871	27,522	24,063	95,601	147,186	1,199	7,439	8,638
1998	5,359	29,766	35,125	17,941	19,075	63,410	100,426	3,592	18,618	22,210
1999	5,304	34,753	40,057	50,910	37,652	82,945	171,507	3,743	20,137	23,880
2000	4,958	37,015	41,973	58,617	35,978	101,988	196,583	3,962	22,741	26,703
2001	9,345	34,586	43,931	34,409	18,004	77,922	130,335	4,283	18,946	23,229
2002	6,875	38,560	45,435	53,261	27,811	62,186	143,258	4,355	27,636	31,991
2003	7,646	33,951	41,597	45,450	36,590	108,981	191,021	4,453	26,968	31,421
2004	8,134	43,002	51,136	52,364	27,884	59,458	139,706	4,165	29,705	33,870
2005	7,669	37,819	45,488	47,512	44,599	128,249	220,360	4,251	23,344	27,595
2006	7,789	35,516	43,305	54,527	43,079	128,210	225,816	4,209	23,275	27,484
2007	10,957	47,300	58,257	40,157	24,391	75,382	139,930	3,776	27,740	31,516
2008	13,292	41,320	54,612	41,186	22,902	59,160	123,248	3,402	18,393	21,795
2009	10,904	30,950	41,854	31,087	19,496	76,363	126,946	3,801	15,452	19,253
2010	12,417	30,816	43,233	47,343	22,571	107,871	177,785	3,757	17,775	21,532
2011	11,314	27,995	39,309	52,726	36,610	127,237	216,573	3,819	23,598	27,417
2012	9,904	29,350	39,254	55,239	20,831	63,794	139,864	3,944	19,474	23,418
2013	12,478	35,929	48,407	44,856	23,640	84,623	153,119	3,681	18,018	21,699
2014	14,685	27,374	42,059	33,742	16,886	77,483	128,111	7,417	14,817	22,234
<b>2015</b>	<b>17,415</b>	<b>28,654</b>	<b>46,069</b>	<b>48,371</b>	<b>25,200</b>	<b>68,431</b>	<b>142,002</b>	<b>13,580</b>	<b>27,292</b>	<b>40,872</b>
2016	17,415	28,655	46,070	48,371	25,200	68,431	142,002	13,580	27,292	40,872
2017	17,415	28,655	46,070	48,371	25,200	68,431	142,002	13,580	27,292	40,872
2018	17,415	28,655	46,070	48,371	25,200	68,431	142,002	13,580	27,292	40,872
2019	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2020	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2021	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2022	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2023	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2024	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2025	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2026	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2027	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2028	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2029	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2030	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2031	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2032	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2033	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2034	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
2035	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,373	27,292	39,665
<b>TOTAL</b>	<b>669,661</b>	<b>1,407,857</b>	<b>2,077,518</b>	<b>2,250,430</b>	<b>1,529,823</b>	<b>5,261,831</b>	<b>9,042,084</b>	<b>336,570</b>	<b>948,448</b>	<b>1,285,018</b>

(a) For the period June 1962 through November 1967, deliveries were supplied by non-Project water.

(b) For the period 1968 through 1987, deliveries are non-Project water pumped through an interim facility.

**TABLE B-5B Annual Water Quantities Delivered to Each Contractor**

(in acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural	Total				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	26,360	1,978	0	127,384	127,384	900	3,084	25,100	184,806
1969	31,375	56	0	141,265	141,265	100	3,016	9,923	185,735
1970	40,407	3,942	0	204,634	204,634	0	5,911	9,578	264,472
1971	41,053	5,990	0	360,151	360,151	3,700	7,212	122,485	540,591
1972	42,443	5,795	0	490,781	490,781	1,400	8,166	258,393	806,978
1973	22,057	3,000	0	341,469	341,469	1,500	3,214	50,464	421,704
1974	33,390	3,000	23,708	323,292	347,000	1,500	3,471	72,289	460,650
1975	40,555	3,000	14,529	396,291	410,820	1,600	3,576	86,258	545,809
1976	41,421	3,000	46,719	392,531	439,250	1,600	4,112	58,811	548,194
1977	11,153	738	27,882	163,425	191,307	1,530	1,472	18,081	224,281
1978	51,747	454	76,895	590,452	667,347	2,070	3,906	12,053	737,577
1979	38,544	1,739	62,997	683,049	746,046	2,000	6,149	155,121	949,599
1980	41,000	894	45,943	588,557	634,500	2,200	5,700	75,444	759,738
1981	41,000	5,859	75,758	615,642	691,400	2,300	4,300	83,438	828,297
1982	41,000	361	47,477	697,823	745,300	1,750	3,838	18,551	810,800
1983	42,900	0	6,854	587,653	594,507	3,550	3,822	1,006	645,785
1984	45,100	0	90,904	769,696	860,600	3,100	5,700	5,743	920,243
1985	46,251	5,197	88,515	800,381	888,896	3,400	5,433	109,791	1,058,968
1986	50,249	1,170	77,240	829,101	906,341	3,700	5,107	79,355	1,045,922
1987	46,288	2,525	117,174	852,731	969,905	4,000	5,625	93,084	1,121,427
1988	47,994	3,475	122,409	887,111	1,009,520	4,000	4,412	95,866	1,165,267
1989	57,049	3,000	123,896	1,022,166	1,146,062	4,000	6,091	127,950	1,344,152
1990	36,296	1,279	127,837	584,611	712,448	2,000	2,922	57,070	812,015
1991	927	221	33,122	8,965	42,087	0	141	2,180	45,556
1992	23,770	1,354	62,326	420,894	483,220	1,806	2,239	46,728	559,117
1993	50,618	2,741	128,316	1,039,614	1,167,930	4,000	4,858	124,468	1,354,615
1994	28,793	1,666	87,139	570,020	657,159	2,116	3,071	62,362	755,167
1995	60,686	1,631	135,415	1,016,114	1,151,529	4,000	5,169	101,869	1,324,884
1996	56,948	1,868	135,654	1,049,409	1,185,063	4,000	4,904	236,875	1,489,658
1997	71,308	0	120,708	987,451	1,108,159	0	5,238	22,369	1,207,074
1998	55,650	542	89,765	768,825	858,590	15	4,401	20,677	939,875
1999	59,697	3,176	138,153	1,039,985	1,178,138	4,000	4,871	289,735	1,539,617
2000	60,539	1,799	40,697	1,183,440	1,224,137	3,600	4,508	201,294	1,495,877
2001	41,902	1,360	3,116	651,175	654,291	1,560	3,592	84,726	787,431
2002	48,915	1,405	12,589	812,870	825,459	2,854	4,885	96,502	980,020
2003	46,082	1,436	47,070	917,160	964,230	3,692	4,266	105,841	1,125,547
2004	49,080	3,562	126,933	712,193	839,126	9,053	4,629	90,021	995,471
2005	79,005	3,834	69,594	1,328,387	1,397,981	19,806	4,194	140,279	1,645,099
2006	72,080	3,282	98,199	1,164,671	1,262,870	9,530	4,242	108,207	1,460,211
2007	45,135	2,084	79,144	949,601	1,028,745	5,746	3,567	87,083	1,172,360
2008	22,174	947	24,572	702,099	726,671	3,836	1,985	33,904	789,517
2009	21,237	1,034	2,912	773,763	776,675	3,391	1,993	36,836	841,166
2010	27,967	3,259	8,183	689,917	698,100	4,679	2,906	70,238	807,149
2011	60,560	1,915	37,112	1,169,231	1,206,343	6,556	2,715	63,141	1,341,230
2012	30,450	2,242	27,874	782,155	810,029	7,405	3,208	95,717	949,051
2013	27,046	1,567	33,501	711,840	745,341	4,645	2,820	48,361	829,780
2014	22,211	467	6,731	652,250	658,981	982	1,586	9,100	693,327
<b>2015</b>	<b>30,215</b>	<b>1,800</b>	<b>79,802</b>	<b>509,836</b>	<b>589,638</b>	<b>5,583</b>	<b>3,420</b>	<b>52,483</b>	<b>683,139</b>
2016	30,215	1,800	79,802	509,836	589,638	5,583	3,420	52,483	683,139
2017	30,215	1,800	79,802	509,836	589,638	5,583	3,420	52,483	683,139
2018	30,215	1,800	79,802	509,836	589,638	5,583	3,420	52,483	683,139
2019	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2020	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2021	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2022	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2023	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2024	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2025	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2026	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2027	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2028	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2029	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2030	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2031	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2032	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2033	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2034	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
2035	26,006	1,800	77,710	511,928	589,638	5,583	3,420	53,353	679,800
<b>TOTAL</b>	<b>2,541,374</b>	<b>137,644</b>	<b>4,365,840</b>	<b>43,294,345</b>	<b>47,660,185</b>	<b>276,415</b>	<b>264,047</b>	<b>4,921,300</b>	<b>55,800,965</b>

**TABLE B-5B Annual Water Quantities Delivered to Each Contractor**

(in acre-feet)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency (c)	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	7,382	0	0	0	0	0	0	0	0
1969	0	9,970	0	0	0	0	0	0	0	0
1970	0	11,739	0	0	0	0	0	0	0	0
1971	0	12,490	0	0	0	0	0	0	0	0
1972	53	13,905	0	464	0	338	55	0	1,275	0
1973	20	9,418	5,800	389	9,000	290	0	0	32,426	0
1974	1,259	9,700	6,400	627	10,000	400	14	0	16,605	612
1975	8,068	10,700	7,000	825	11,000	520	0	0	13,865	5,450
1976	27,782	11,700	7,600	1,002	12,000	589	0	0	12,273	6,071
1977	11,202	5,075	0	1,109	0	111	80	0	24,833	8,996
1978	44,137	11,362	10,084	1,209	15,300	208	0	0	4,055	7,771
1979	60,493	19,145	10,063	1,260	15,000	133	4,000	0	18	290
1980	72,407	15,092	10,884	1,239	17,000	191	4,000	0	0	1,085
1981	79,375	18,461	12,105	1,485	19,000	1,270	4,000	0	16,021	3,619
1982	50,291	22,216	13,326	1,238	21,000	0	10,500	0	8,409	12,599
1983	32,961	22,135	14,547	911	23,000	38	0	0	5,994	734
1984	32,662	24,218	15,768	1,128	25,000	1	0	0	5,556	7,656
1985	37,064	24,500	16,989	1,422	27,000	0	0	1,558	7,390	5,028
1986	32,449	27,229	18,210	1,506	29,000	163	0	3,096	6,421	9,454
1987	34,089	27,988	19,431	1,849	31,500	1,085	17	5,379	18,751	10,630
1988	34,079	30,438	20,652	2,006	34,000	419	9	1,770	21,386	8,948
1989	45,280	36,364	21,873	2,170	36,500	971	200	9,009	20,782	12,839
1990	47,206	28,579	23,100	1,827	38,100	1,747	0	8,608	18,831	16,649
1991	9,568	4,562	6,930	849	11,430	522	3,423	3,914	3,661	5,399
1992	30,265	20,699	10,427	519	17,197	251	10,686	4,035	3,358	7,908
1993	43,102	23,039	23,100	439	38,100	734	11,514	7,761	4,361	14,397
1994	49,153	26,441	14,102	785	23,257	1,098	16,852	8,418	9,135	15,230
1995	47,286	27,233	23,100	409	38,100	480	8,722	6,961	696	12,922
1996	56,356	32,500	62,219	485	102,622	494	7,427	11,434	6,064	15,989
1997	62,393	27,712	68,340	651	69,990	444	10,374	11,861	9,654	18,175
1998	52,926	20,093	85,709	187	70,647	404	3,925	8,752	1,878	9,310
1999	69,073	32,899	50,480	1,132	58,100	342	8,144	13,278	12,874	21,729
2000	83,577	40,680	42,323	1,194	58,234	0	11,380	9,060	18,399	15,140
2001	62,857	31,939	9,100	1,057	15,010	0	4,433	10,427	26,488	2,360
2002	58,171	68,817	16,755	2,189	27,640	0	4,346	18,496	72,069	24,851
2003	60,029	55,736	14,443	1,563	23,819	0	14,435	11,547	26,113	21,934
2004	59,731	83,761	15,465	2,006	21,190	0	13,176	12,162	57,030	12,541
2005	59,831	59,456	42,519	807	49,089	0	13,561	11,712	31,550	13,984
2006	80,384	62,752	121,100	641	50,000	0	34,014	12,492	35,331	16,284
2007	80,203	60,190	73,228	1,768	30,234	0	46,109	19,634	57,116	4,024
2008	54,436	42,878	46,791	848	26,428	25	25,396	14,255	35,145	7,212
2009	45,670	42,085	46,022	894	18,263	42	29,047	15,339	39,346	11,520
2010	58,489	57,900	85,592	357	31,183	0	38,152	10,969	49,379	19,180
2011	94,046	33,191	90,279	474	36,379	0	5,099	14,333	38,126	23,591
2012	111,207	50,473	117,587	624	45,101	0	11,244	18,897	112,972	22,058
2013	51,003	61,754	66,539	1,368	20,791	0	7,483	10,567	32,085	9,252
2014	27,609	36,737	12,750	2,176	2,989	115	2,871	7,135	16,982	1,200
<b>2015</b>	<b>86,906</b>	<b>57,120</b>	<b>83,010</b>	<b>3,480</b>	<b>33,450</b>	<b>1,380</b>	<b>49,680</b>	<b>12,780</b>	<b>61,560</b>	<b>17,280</b>
2016	86,906	57,120	83,010	3,480	33,450	1,380	49,680	12,780	61,560	17,280
2017	86,906	57,120	83,010	3,480	33,450	1,380	49,680	12,780	61,560	17,280
2018	86,906	57,120	83,010	3,480	33,450	1,380	49,680	12,780	61,560	17,280
2019	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2020	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2021	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2022	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2023	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2024	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2025	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2026	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2027	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2028	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2029	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2030	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2031	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2032	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2033	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2034	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
2035	84,840	57,120	83,010	3,480	33,450	1,380	53,880	12,780	61,560	17,280
<b>TOTAL</b>	<b>3,848,146</b>	<b>2,612,853</b>	<b>3,121,942</b>	<b>120,168</b>	<b>1,961,643</b>	<b>42,405</b>	<b>1,479,368</b>	<b>571,239</b>	<b>2,227,463</b>	<b>807,501</b>

(c) Devil's Den Water District merged with Castaic Lake Water Agency effective January 1, 1992.

**TABLE B-5B Annual Water Quantities Delivered to Each Contractor**

(in acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (contd.)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1962	0	0	0	0	0	0	0	0	0	8,906
1963	0	0	0	0	0	0	0	0	0	12,645
1964	0	0	0	0	0	0	0	0	0	20,911
1965	0	0	0	0	0	0	0	0	0	34,026
1966	0	0	0	0	0	0	0	0	0	54,913
1967	0	0	0	0	0	0	0	0	0	56,763
1968	0	0	0	7,382	0	0	0	0	0	294,457
1969	0	0	0	9,970	0	0	0	0	0	268,104
1970	0	0	0	11,739	0	0	70	70	0	369,459
1971	0	0	0	12,490	0	192	64	256	0	654,442
1972	0	71,938	0	88,028	0	186	505	691	0	1,037,770
1973	0	159,883	0	217,226	0	53	679	732	0	737,532
1974	0	277,717	0	323,334	0	127	648	775	0	878,947
1975	0	526,491	0	583,919	0	253	405	658	0	1,230,830
1976	0	618,451	0	697,468	0	527	382	909	0	1,380,124
1977	0	189,755	0	241,161	0	706	303	1,009	0	582,381
1978	0	507,565	0	601,691	0	579	278	857	0	1,458,733
1979	0	477,074	0	587,476	0	302	329	631	0	1,666,457
1980	0	531,727	0	653,625	0	267	295	562	0	1,536,456
1981	0	795,846	0	951,182	0	221	355	576	0	1,918,563
1982	0	691,192	0	830,771	0	334	305	639	0	1,750,862
1983	0	343,521	0	443,841	0	325	262	587	0	1,187,156
1984	0	457,582	0	569,571	108	177	272	557	0	1,591,416
1985	0	683,625	0	804,576	62	308	254	624	0	1,990,295
1986	0	708,840	0	836,368	328	313	317	958	0	1,999,155
1987	0	712,424	0	863,143	88	459	452	999	0	2,131,608
1988	0	902,564	0	1,056,271	303	385	523	1,211	0	2,385,122
1989	0	1,156,698	0	1,342,686	403	300	486	1,189	0	2,853,747
1990	0	1,396,423	4,836	1,585,906	494	380	548	1,422	0	2,582,151
1991	0	391,447	988	442,693	265	328	420	1,013	0	549,113
1992	0	710,313	0	815,658	642	117	485	1,244	0	1,471,454
1993	0	652,190	0	818,737	746	256	444	1,446	0	2,315,235
1994	0	807,866	0	972,337	1,035	329	492	1,856	0	1,861,976
1995	0	436,042	0	601,951	910	203	308	1,421	0	2,031,423
1996	0	593,380	0	888,970	820	257	360	1,437	0	2,543,472
1997	0	721,810	1,850	1,003,254	1,005	185	231	1,421	0	2,405,444
1998	0	410,065	1,850	665,746	1,054	527	0	1,581	0	1,764,963
1999	0	852,617	1,850	1,122,518	1,096	286	0	1,382	0	2,898,961
2000	0	1,522,412	4,050	1,806,449	901	586	0	1,487	0	3,569,072
2001	0	1,023,169	1,850	1,188,690	1,065	513	0	1,578	0	2,175,194
2002	0	1,408,919	4,998	1,707,251	1,181	419	0	1,600	0	2,909,555
2003	116	1,701,615	5,000	1,936,350	1,324	551	0	1,875	0	3,327,811
2004	841	1,724,380	5,250	2,007,533	1,434	1,440	0	2,874	0	3,230,590
2005	692	1,528,045	1,665	1,812,911	1,894	527	0	2,421	0	3,753,874
2006	4,278	1,512,186	1,850	1,931,312	5,342	468	0	5,810	0	3,693,938
2007	3,935	1,499,688	3,000	1,879,129	2,327	956	0	3,283	0	3,284,475
2008	4,905	898,313	3,798	1,160,430	1,923	451	243	2,617	0	2,152,219
2009	6,397	930,871	3,891	1,189,387	2,114	581	200	2,895	0	2,221,501
2010	8,240	1,416,062	4,075	1,779,578	2,331	807	243	3,381	0	2,832,658
2011	10,503	1,686,570	4,000	2,036,591	2,297	1,092	98	3,487	0	3,664,607
2012	11,010	1,224,907	4,353	1,730,433	2,695	1,374	79	4,148	0	2,886,168
2013	9,445	892,550	2,890	1,165,727	4,850	908	366	6,124	0	2,224,856
2014	5,627	484,355	1,000	601,546	5,003	1,375	125	6,503	0	1,493,780
<b>2015</b>	<b>10,380</b>	<b>1,138,469</b>	<b>3,000</b>	<b>1,558,495</b>	<b>5,760</b>	<b>1,661</b>	<b>1,560</b>	<b>8,981</b>	<b>0</b>	<b>2,479,558</b>
2016	10,380	1,138,469	3,000	1,558,495	5,760	1,661	1,619	9,040	0	2,479,618
2017	10,380	1,138,469	3,000	1,558,495	5,760	1,661	1,619	9,040	0	2,479,618
2018	10,380	1,138,469	3,000	1,558,495	5,760	1,661	1,619	9,040	0	2,479,618
2019	10,380	1,146,900	9,000	1,575,060	5,760	1,786	1,619	9,165	0	2,483,330
2020	10,380	1,146,900	9,000	1,575,060	5,760	1,846	1,619	9,225	0	2,483,390
2021	10,380	1,146,900	9,000	1,575,060	5,760	1,911	1,619	9,290	0	2,483,455
2022	10,380	1,146,900	9,000	1,575,060	5,760	1,982	1,619	9,361	0	2,483,526
2023	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2024	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2025	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2026	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2027	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2028	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2029	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2030	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2031	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2032	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2033	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2034	10,380	1,146,900	9,000	1,575,060	5,760	2,061	1,619	9,440	0	2,483,605
2035	10,380	1,146,900	9,000	1,575,060	5,760	2,143	1,619	9,522	0	2,483,687
<b>TOTAL</b>	<b>283,969</b>	<b>60,290,264</b>	<b>228,044</b>	<b>77,595,005</b>	<b>167,000</b>	<b>61,974</b>	<b>45,766</b>	<b>274,740</b>	<b>0</b>	<b>146,075,330</b>

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 1 of 10

Calendar Year	NORTH BAY AQUEDUCT											
	Barker Slough Pumping Plant				Cordelia Pumping Plant Solano County WA				Cordelia Pumping Plant Napa County FC&WCD			
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery (a)	Total
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	24	(10)	1,214	1,228
1969	0	0	0	0	0	0	0	0	0	2	4,687	2,689
1970	0	0	0	0	0	0	0	0	0	18	3,618	3,636
1971	0	0	0	0	0	0	0	0	0	4	2,521	2,525
1972	0	0	0	0	0	0	0	0	0	(10)	3,647	3,637
1973	0	0	0	0	0	0	0	0	0	1	3,792	3,793
1974	0	0	0	0	0	0	0	0	0	10	4,870	4,880
1975	0	0	0	0	0	0	0	0	0	10	6,840	6,850
1976	0	0	0	0	0	0	0	0	0	4	7,122	7,126
1977	0	0	0	0	0	0	0	0	0	2	8,226	8,228
1978	0	0	0	0	0	0	0	0	0	(6)	6,034	6,028
1979	0	0	0	0	0	0	0	0	0	1	6,561	6,562
1980	0	0	0	0	0	0	0	0	0	(3)	6,707	6,704
1981	0	0	0	0	0	0	0	0	0	8	9,001	9,009
1982	0	0	0	0	0	0	0	0	0	(8)	1,213	1,205
1983	0	0	0	0	0	0	0	0	0	(12)	2,287	2,275
1984	0	0	0	0	0	0	0	0	0	(15)	2,923	2,908
1985	0	0	0	0	0	0	0	0	0	13	4,039	4,052
1986	0	0	0	0	0	0	0	0	0	(4)	3,519	3,515
1987	0	0	0	0	0	0	0	0	0	0	7,693	7,693
1988	1	283	15,118	15,402	0	0	9,725	9,725	1	(1)	5,392	5,392
1989	0	758	23,451	24,209	0	0	17,246	17,246	0	(4)	6,195	6,191
1990	0	3	26,071	26,074	0	(634)	15,856	15,222	0	3	6,940	6,943
1991	0	667	8,352	9,019	0	124	3,855	3,979	0	198	1,380	1,578
1992	0	1,643	18,774	20,417	0	0	9,220	9,220	0	0	4,001	4,001
1993	0	1,153	34,466	35,619	0	0	14,471	14,471	0	0	5,286	5,286
1994	0	780	32,048	32,828	0	(6)	14,913	14,907	0	0	6,792	6,792
1995	0	908	26,527	27,435	0	0	15,893	15,893	0	0	5,182	5,182
1996	0	1,354	34,892	36,246	0	0	17,069	17,069	0	0	4,893	4,893
1997	0	1,422	37,871	39,293	0	0	17,501	17,501	0	0	4,341	4,341
1998	0	1,343	35,125	36,468	0	0	18,204	18,204	0	0	5,359	5,359
1999	0	2,522	40,057	42,579	0	0	19,562	19,562	0	0	5,304	5,304
2000	0	1,853	31,738	33,591	0	4	21,525	21,529	0	180	4,958	5,138
2001	0	1,760	35,571	37,331	0	0	19,737	19,737	0	0	9,345	9,345
2002	0	496	36,846	37,342	0	0	19,719	19,719	0	0	6,875	6,875
2003	0	3,991	34,579	38,570	0	0	16,700	16,700	0	0	7,637	7,637
2004	0	2,181	40,141	42,322	0	0	21,686	21,686	0	0	8,499	8,499
2005	0	935	36,884	37,819	0	0	19,189	19,189	0	0	8,009	8,009
2006	0	1,005	35,519	36,524	0	0	18,651	18,651	0	0	8,081	8,081
2007	0	1,189	42,765	43,954	0	0	27,793	27,793	0	0	11,277	11,277
2008	0	845	46,601	47,446	0	0	19,436	19,436	0	255	13,740	13,995
2009	0	537	35,032	35,569	0	0	15,473	15,473	0	130	11,377	11,507
2010	0	809	36,676	39,485	0	0	12,788	12,788	0	254	12,847	13,101
2011	0	803	34,238	35,041	0	0	12,832	12,832	0	213	11,275	11,488
2012	0	686	34,666	35,352	0	0	12,886	12,886	0	196	9,860	10,056
2013	0	1,150	39,085	40,235	0	0	19,404	19,404	0	350	12,478	12,828
2014	0	51	29,042	29,093	0	0	17,473	17,473	0	5	14,985	14,990
2015	0	51	46,069	46,120	0	0	12,500	12,500	0	5	17,415	17,420
2016	0	51	46,070	46,121	0	0	12,555	12,555	0	5	17,415	17,420
2017	0	51	46,070	46,121	0	0	12,555	12,555	0	5	17,415	17,420
2018	0	51	46,070	46,121	0	0	12,555	12,555	0	5	17,415	17,420
2019	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2020	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2021	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2022	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2023	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2024	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2025	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2026	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2027	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2028	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2029	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2030	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2031	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2032	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2033	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2034	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420
2035	0	51	46,069	46,120	0	0	12,661	12,661	0	5	17,415	17,420

(a) For the period 1968 through 1987, deliveries are non-SWP water pumped through an interim facility.



**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 2 of 10

Calendar  Year	SOUTH BAY AQUEDUCT						CALIFORNIA AQUEDUCT								
	South Bay Pumping Plant						North San Joaquin Division Banks Pumping Plant								
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Conservation Water	Total	
				Water Supply (b)	Recreation					Water Supply	Recreation				
[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]		
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1962	9	272	0	8,906	0	9,187	0	0	0	0	0	0	0	0	
1963	71	185	0	12,645	0	12,901	0	0	0	0	0	0	0	0	
1964	171	152	0	20,911	0	21,234	0	0	0	0	0	0	0	0	
1965	93	729	0	34,026	0	34,848	0	0	0	0	0	0	0	0	
1966	0	1,746	0	54,913	0	56,659	0	0	0	0	0	0	0	0	
1967	0	1,677	0	56,763	0	58,440	5,746	1,183	0	11,538	0	18,467	2,957	21,424	
1968	0	1,847	0	101,055	0	102,902	11,079	74,464	0	293,243	0	378,786	531,275	910,061	
1969	3,449	2,668	0	69,712	0	75,829	7,336	44,287	0	265,417	0	317,040	531,185	848,225	
1970	16,279	1,086	(5,355)	89,560	0	101,570	23,947	20,767	(5,355)	365,771	0	405,130	(12,995)	392,135	
1971	0	1,815	8,854	98,584	0	109,253	23,207	(10,754)	8,854	651,665	8	672,980	7,708	680,688	
1972	0	3,557	2,273	138,426	0	144,256	145,066	9,057	(4,285)	1,033,432	6,489	1,189,759	48,300	1,238,059	
1973	0	(33)	(1,510)	94,078	0	92,535	214,941	(4,951)	2,902	733,008	1,155	947,055	55,846	1,002,901	
1974	0	1,287	(10,056)	89,318	0	80,549	247,894	(11,526)	(32,510)	873,302	2,118	1,079,278	54,683	1,133,961	
1975	0	320	8,550	93,604	0	102,474	110,149	(8,092)	16,101	1,223,332	3,377	1,344,867	(102,625)	1,242,242	
1976	0	2,431	1,391	126,431	141	130,394	67,834	5,443	(244,124)	1,372,093	1,745	1,202,991	(442,348)	760,643	
1977	0	2,866	2,685	107,704	112	113,367	0	39,897	(157,543)	573,146	1,111	456,611	(13,507)	443,104	
1978	0	2,165	(11,249)	112,574	126	103,616	67,457	(36,898)	35,129	1,451,842	1,177	1,518,707	752,075	2,270,782	
1979	0	2,401	1,069	122,190	89	125,749	17,397	60,958	(32,307)	1,659,265	1,398	1,706,711	(112,053)	1,642,929	
1980	0	1,758	(6,563)	115,824	123	111,142	3,159	58,484	(275,538)	1,529,187	2,131	1,317,423	186,601	1,504,024	
1981	0	2,627	13,742	129,507	121	145,997	46,060	85,350	40,536	1,908,986	4,974	2,085,906	(931,878)	1,154,028	
1982	0	2,344	(23,928)	107,439	129	85,984	5,979	61,556	99,897	1,743,145	4,646	1,915,223	347,983	2,263,206	
1983	0	2,151	(22,886)	94,656	132	74,053	6,071	47,022	(310,477)	1,184,282	7,853	934,751	835,771	1,770,522	
1984	0	2,088	8,442	98,122	158	108,810	38,649	97,143	(108,548)	1,587,936	5,874	1,621,054	21,875	1,642,929	
1985	0	2,817	(1,607)	122,088	152	123,450	0	110,469	137,783	1,985,632	5,452	2,239,336	(110,569)	2,128,767	
1986	0	2,299	(1,850)	110,988	130	111,567	0	90,799	20,177	1,993,278	3,865	2,108,119	200,298	2,308,417	
1987	0	2,625	(584)	136,796	137	138,974	0	91,427	(23,116)	2,121,366	7,672	2,197,349	(458,725)	1,738,624	
1988	0	2,884	(698)	147,255	142	149,583	0	107,249	(35,484)	2,368,793	4,889	2,445,447	(303,583)	2,141,864	
1989	0	2,673	3,296	142,269	152	148,390	0	117,603	(38,058)	2,829,107	8,135	2,916,787	421,131	3,337,918	
1990	0	894	1,982	156,537	168	159,581	0	99,059	(290,965)	2,554,658	9,262	2,372,014	(374,027)	1,997,987	
1991	0	2,637	(4,532)	50,259	150	48,514	0	80,106	(79,038)	539,748	4,879	545,695	554,904	1,100,599	
1992	0	2,881	756	76,661	147	80,445	0	91,391	(218,170)	1,451,436	2,605	1,327,262	61,343	1,388,605	
1993	0	1,940	(20,051)	105,971	143	88,003	0	149,372	(273,789)	2,279,323	2,609	2,157,515	849,249	3,006,764	
1994	0	1,981	1,714	100,568	168	104,431	0	148,712	(120,985)	1,828,072	3,803	1,859,602	(324,640)	1,534,962	
1995	0	1,188	(12,333)	76,640	146	65,641	0	173,074	(397,605)	2,003,475	2,575	1,781,519	293,159	2,074,678	
1996	0	981	(1,990)	77,215	150	76,356	0	123,502	78,123	2,507,143	3,902	2,712,670	288,576	3,001,246	
1997	0	1,575	5,016	102,186	155	108,932	527	135,106	(98,334)	2,366,152	2,594	2,406,045	(50,000)	2,356,045	
1998	0	1,551	3,595	70,876	114	76,136	0	91,319	(346,039)	1,728,257	2,107	1,475,644	120,886	1,596,530	
1999	0	2,166	12,313	100,497	139	115,115	0	135,809	(17,569)	2,855,522	4,301	2,978,663	(307,839)	2,670,224	
2000	0	2,346	(20,958)	135,533	145	117,006	0	115,895	(13,232)	3,474,523	5,182	3,562,368	(15,487)	3,566,881	
2001	0	2,784	1,301	95,335	196	99,616	0	222,144	(17,529)	1,874,096	1,978	2,080,689	86,928	2,167,617	
2002	0	2,534	(13,938)	123,577	146	112,319	0	225,032	36,404	2,816,389	4,672	3,082,497	(151,719)	2,930,778	
2003	0	2,920	(1,399)	132,714	131	134,366	0	329,699	(49,580)	3,193,449	11,362	3,484,930	325,348	3,710,278	
2004	0	2,982	(7,240)	125,928	150	121,820	0	83,788	(4,079)	2,979,217	1,337	3,060,263	103,811	3,164,074	
2005	0	2,823	(3,565)	108,136	154	107,548	0	151,931	(163,243)	3,665,023	1,270	3,654,981	535,754	4,190,735	
2006	0	2,989	(9,645)	118,272	169	111,785	0	67,040	(129,767)	3,571,009	1,208	3,509,490	43,481	3,552,971	
2007	0	2,840	14,928	134,172	146	152,086	0	73,956	133,124	2,736,094	830	2,944,004	(398,297)	2,545,707	
2008	0	2,215	880	116,562	166	119,823	0	130,066	(3,350)	1,413,730	1,082	1,541,528	(397,949)	1,143,579	
2009	0	1,999	(1,134)	116,947	108	117,920	0	111,805	(1,860)	1,572,819	2,023	1,684,787	928,666	2,613,453	
2010	0	1,717	3,436	95,802	117	101,072	0	203,757	51,667	2,243,593	1,163	2,500,180	37,606	2,537,786	
2011	0	1,534	(2,332)	112,952	122	112,276	0	314,282	(21,148)	3,315,056	1,588	3,609,778	165,312	3,775,090	
2012	0	2,025	5,931	112,056	150	120,162	0	143,580	20,504	2,612,091	1,606	2,777,781	(473,745)	2,304,036	
2013	0	2,753	(5,596)	147,119	137	144,413	0	173,145	(6,654)	1,753,537	1,641	1,921,669	(123,957)	1,797,712	
2014	0	3,196	0	105,033	400	108,629	0	133,093	(8,000)	921,034	8,660	1,054,787	153,435	1,208,222	
2015	0	3,198	0	137,002	400	140,600	0	133,128	0	2,424,508	8,660	2,566,296	129,272	2,695,568	
2016	0	3,198	0	140,200	400	143,798	0	131,399	(2,000)	2,424,508	8,660	2,562,567	166,188	2,728,755	
2017	0	3,351	0	140,200	400	143,951	0	128,602	61,309	2,424,508	8,660	2,623,079	119,885	2,742,964	
2018	0	3,351	0	140,200	400	143,951	0	128,369	(80,817)	2,424,508	8,660	2,480,720	(194,534)	2,286,186	
2019	0	3,351	0	133,571	400	137,322	0	128,613	50,179	2,428,096	8,660	2,615,548	77,224	2,692,772	
2020	0	3,351	0	133,571	400	137,322	0	128,690	(366)	2,428,096	8,660	2,565,080	(8,687)	2,556,393	
2021	0	3,351	0	133,571	400	137,322	0	128,769	10,725	2,428,096	8,660	2,576,250	(1,095)	2,575,155	
2022	0	3,351	0	133,571	400	137,322	0	128,846	(3,483)	2,428,096	8,660	2,562,119	(185,907)	2,376,212	
2023	0	3,351	0	133,571	400	137,322	0	128,818	(18,971)	2,428,096	8,660	2,546,603	115,791	2,662,394	
2024	0	3,351	0	133,571	400	137,322	0	128,625	11,289	2,428,096	8,660	2,576,670	79,858	2,656,528	
2025	0	3,351	0	133,571	400	137,322	0	130,380	(12,518)	2,428,096	8,660	2,554,618	(247,205)	2,307,413	
2026	0	3,351	0	133,571	400	137,322	0	128,700	24,308	2,428,096	8,660	2,589,764	246,850	2,836,614	
2027	0	3,351	0	133,571	400	137,322	0	128,692	(17,799)	2,428,096	8,660	2,547,649	(12,304)	2,535,345	
2028	0	3,351	0	133,571	400	137,322	0	128,783	12,291	2,428,096	8,660	2,577,830	15,430	2,593,260	
2029	0	3,351	0	133,571	400	137,322	0	128,671	(9,046)	2,428,096	8,660	2,556,381	(10,778)	2,545,603	
2030	0	3,351	0	133,571	400	137,322	0	128,777	20,756	2,428,096	8,660	2,586,289	124,586	2,710,875	
2031	0	3,351	0	133,571	400	137,322	0	128,134	(97,726)	2,428,096	8,660	2,467,164	(259,831)	2,207,333	
2032	0	3,351	0	133,571	400	137,322	0	128,005	84,999	2,428,096	8,660	2,649,760	138,527	2,788,287	
2033	0	3,351	0	133,571	400	137,322	0	127,876	(94,652)	2,428,096	8,660	2,469,980	(184,372)	2,285,608	
2034	0	3,351	0	133,571	400	137,322	0	127,725	69,593	2,428,096	8,660	2,634,074	120,375	2,754,449	
2035	0	3,351	0	133,571	400	137,322	0	127,379	(242,659)	2,428,096	8,660	2,32			

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 3 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	San Luis Division						South San Joaquin Division					
	Dos Amigos Pumping Plant						Buena Vista Pumping Plant					
	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recrea- tion	Water Supply					Recrea- tion		
[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	11,079	25,126	0	189,104	0	225,309	0	0	0	0	0	0
1969	3,887	9,922	0	192,689	0	206,498	0	0	0	0	0	0
1970	7,668	1,901	0	270,300	0	279,869	4,779	1,012	0	3	0	5,794
1971	23,207	(12,030)	0	545,869	0	557,046	7,853	8,399	0	101,512	0	117,764
1972	145,066	(6,635)	(6,558)	886,840	6,481	1,025,194	100,274	20,044	(6,558)	223,626	6,481	343,867
1973	214,941	(6,778)	1,329	635,716	1,147	846,355	204,638	35,695	1,329	311,096	1,147	553,905
1974	247,894	(16,765)	(15,295)	780,513	2,108	998,455	237,554	19,672	(15,295)	388,949	2,108	632,988
1975	110,149	(12,144)	(693)	1,126,152	3,358	1,226,822	103,352	26,342	(693)	672,531	3,358	804,890
1976	67,834	(456)	(152,171)	1,241,550	1,581	1,158,338	61,122	29,428	(152,171)	785,055	1,581	725,015
1977	0	26,359	(116,219)	463,970	737	374,847	0	25,173	(116,219)	271,944	560	181,458
1978	67,457	1,905	79,308	1,335,362	680	1,484,712	65,027	17,751	121,904	762,043	674	967,399
1979	17,397	33,884	(51,299)	1,530,926	685	1,531,593	12,302	46,157	(51,299)	737,714	502	745,376
1980	3,159	34,391	(272,825)	1,407,663	1,514	1,173,902	0	49,025	(134,009)	778,059	1,262	694,337
1981	46,060	36,962	23,359	1,775,179	4,348	1,885,908	0	38,942	23,359	1,077,322	4,112	1,143,735
1982	5,979	57,146	116,086	1,631,868	4,205	1,815,284	0	29,059	117,174	990,863	4,045	1,141,141
1983	6,071	63,583	(101,155)	1,085,804	7,475	1,061,778	0	40,205	(101,155)	593,920	7,291	540,261
1984	38,649	109,263	(112,744)	1,484,114	5,391	1,524,673	0	38,487	(114,984)	781,955	5,244	1,170,702
1985	0	86,772	138,898	1,858,111	4,936	2,088,717	0	42,838	139,689	992,606	4,804	1,179,937
1986	0	51,963	19,989	1,877,183	3,426	1,952,561	0	36,751	37,546	1,014,294	3,285	1,091,876
1987	0	64,827	(25,707)	1,978,945	7,121	2,025,186	0	30,495	(25,522)	1,027,361	6,937	1,039,271
1988	0	72,679	(34,592)	2,217,126	4,490	2,259,703	0	38,804	(29,747)	1,244,196	4,360	1,257,613
1989	0	90,090	(29,411)	2,679,845	7,652	2,748,176	0	29,594	(60,826)	1,532,625	7,490	1,508,883
1990	0	115,074	(11,323)	2,394,999	8,922	2,507,672	0	46,865	(15,092)	1,778,991	8,879	1,810,643
1991	0	92,227	9,325	489,348	4,605	595,505	0	39,274	96,506	446,916	4,560	587,256
1992	0	118,796	(225,603)	1,372,536	2,079	1,267,808	0	28,138	(98,271)	920,978	1,995	852,840
1993	0	136,432	(220,537)	2,170,494	1,864	2,088,253	0	14,186	(128,363)	980,200	1,676	795,699
1994	0	152,414	(78,957)	1,724,433	3,098	1,800,988	0	35,083	(88,211)	1,107,122	2,918	1,056,912
1995	0	137,937	(12,473)	1,921,666	1,711	2,048,841	0	33,963	(16,431)	706,742	1,669	725,943
1996	0	45,591	14,927	2,425,024	2,998	2,488,540	0	31,304	15,438	988,612	2,928	1,038,282
1997	527	107,033	(66,814)	2,247,628	2,090	2,290,464	0	42,670	40,852	1,054,461	2,076	1,140,059
1998	0	95,185	(338,076)	1,664,080	1,589	1,422,778	0	41,910	(106,487)	753,731	1,585	690,739
1999	0	95,262	(2,778)	2,750,154	3,285	2,845,923	0	48,502	(2,807)	1,131,826	3,279	1,180,800
2000	0	134,231	7,726	3,273,337	4,222	3,419,516	0	37,514	7,726	1,814,685	4,216	1,864,141
2001	0	150,830	(18,830)	1,615,776	1,218	1,748,994	0	31,361	(18,830)	1,318,835	1,211	1,332,577
2002	0	92,905	50,342	2,628,462	3,968	2,775,677	0	41,565	50,342	1,831,874	3,961	1,927,742
2003	0	85,360	(48,181)	2,893,333	10,656	2,941,168	0	43,352	(48,181)	1,909,192	10,645	1,915,008
2004	0	25,865	3,161	2,807,825	652	2,837,503	0	41,551	3,161	2,102,371	649	2,147,732
2005	0	62,569	(159,678)	3,423,490	581	3,326,962	0	35,019	(159,678)	1,846,180	559	1,722,080
2006	0	(12,341)	(120,122)	3,501,308	504	3,369,349	0	30,271	(120,122)	2,077,130	504	1,987,783
2007	0	47,736	118,196	2,419,032	312	2,585,276	0	43,400	118,196	2,002,793	305	2,164,694
2008	0	103,375	(4,230)	1,296,068	361	1,395,574	0	39,056	(4,230)	1,275,174	327	1,310,327
2009	0	76,206	(726)	1,318,452	1,367	1,395,299	0	32,900	(726)	1,217,847	1,295	1,251,316
2010	0	76,447	48,231	2,307,963	636	2,433,277	0	43,377	48,231	1,505,105	603	1,597,316
2011	0	66,937	(18,816)	3,343,960	870	3,392,951	0	39,914	(18,816)	1,820,268	742	1,842,108
2012	0	113,586	14,573	2,542,296	942	2,671,397	0	95,029	14,573	1,672,315	938	1,782,855
2013	0	174,857	(1,058)	1,549,818	836	1,724,453	0	105,771	(1,058)	1,275,698	795	1,381,206
2014	0	73,493	(8,000)	623,298	7,210	696,001	0	44,031	(8,000)	796,630	7,010	839,671
<b>2015</b>	<b>0</b>	<b>73,490</b>	<b>0</b>	<b>2,282,786</b>	<b>7,210</b>	<b>2,363,486</b>	<b>0</b>	<b>44,028</b>	<b>0</b>	<b>1,680,634</b>	<b>7,010</b>	<b>1,731,672</b>
2016	0	73,491	(2,000)	2,279,588	7,210	2,358,289	0	44,029	(2,000)	1,680,634	7,010	1,729,673
2017	0	70,586	61,309	2,279,588	7,210	2,418,693	0	41,124	61,309	1,680,634	7,010	1,790,077
2018	0	70,740	(80,817)	2,279,588	7,210	2,276,721	0	41,278	(80,817)	1,680,634	7,010	1,648,105
2019	0	70,564	50,179	2,289,934	7,210	2,417,887	0	41,102	50,179	1,644,359	7,010	1,742,650
2020	0	70,628	(366)	2,289,934	7,210	2,367,406	0	41,166	(366)	1,644,659	7,010	1,692,469
2021	0	70,711	10,725	2,289,934	7,210	2,378,580	0	41,249	10,725	1,645,459	7,010	1,704,443
2022	0	70,705	(3,483)	2,289,934	7,210	2,364,366	0	41,243	(3,483)	1,646,359	7,010	1,691,129
2023	0	70,696	(18,971)	2,289,934	7,210	2,348,869	0	41,234	(18,971)	1,647,159	7,010	1,676,432
2024	0	70,575	11,289	2,289,934	7,210	2,379,008	0	41,113	11,289	1,648,059	7,010	1,707,471
2025	0	70,638	(12,518)	2,289,934	7,210	2,355,264	0	41,176	(12,518)	1,648,859	7,010	1,684,527
2026	0	70,650	24,308	2,289,934	7,210	2,392,102	0	41,188	24,308	1,649,359	7,010	1,721,865
2027	0	70,563	(17,799)	2,289,934	7,210	2,349,908	0	41,101	(17,799)	1,649,959	7,010	1,680,271
2028	0	70,703	12,291	2,289,934	7,210	2,380,138	0	41,241	12,291	1,650,459	7,010	1,711,001
2029	0	70,630	(9,046)	2,289,934	7,210	2,358,728	0	41,168	(9,046)	1,651,159	7,010	1,690,291
2030	0	70,694	20,756	2,289,934	7,210	2,388,594	0	41,232	20,756	1,651,759	7,010	1,720,757
2031	0	70,566	(97,726)	2,289,934	7,210	2,269,984	0	41,104	(97,726)	1,652,659	7,010	1,603,047
2032	0	70,168	84,999	2,289,934	7,210	2,452,311	0	40,706	84,999	1,653,459	7,010	1,786,174
2033	0	70,373	(94,652)	2,289,934	7,210	2,272,865	0	40,911	(94,652)	1,654,259	7,010	1,607,528
2034	0	69,865	69,593	2,289,934	7,210	2,436,602	0	40,403	69,593	1,655,059	7,010	1,772,065
2035	0	69,205	(242,659)	2,289,934	7,210	2,123,690	0	39,743	(242,659)	1,655,859	7,010	1,459,953

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 4 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	South San Joaquin Division (continued)											
	Teerink Pumping Plant						Chrisman Pumping Plant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]	[49]	[50]	
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	198	2	0	0	0	200	0	0	0	0	0	0
1971	7,533	(112)	0	3,552	0	10,973	7,366	(159)	0	0	0	7,207
1972	100,274	12,765	(6,558)	84,955	6,481	197,917	100,274	13,160	(6,558)	78,891	6,481	192,248
1973	204,638	21,543	1,329	229,685	1,147	458,342	204,638	32,414	1,329	209,769	1,147	449,297
1974	237,554	11,843	(15,295)	336,198	2,108	572,408	237,554	17,655	(15,295)	318,198	2,108	560,220
1975	103,352	19,763	(693)	621,706	3,358	747,486	103,352	25,326	(693)	586,286	3,358	717,629
1976	61,122	18,552	(152,171)	740,486	1,581	669,570	61,122	21,468	(152,171)	700,935	1,581	632,935
1977	0	16,415	(116,219)	246,349	560	147,105	0	15,698	(116,219)	240,191	560	140,230
1978	65,027	28,820	121,904	631,121	674	847,546	65,027	26,705	121,904	599,973	674	814,283
1979	12,302	50,663	(51,299)	625,561	502	637,729	12,302	50,580	(51,299)	586,959	502	599,044
1980	0	48,825	(134,009)	696,405	1,262	612,483	0	58,085	(134,009)	658,588	1,262	583,926
1981	0	51,600	23,359	998,307	4,112	1,077,378	0	48,844	23,359	959,274	4,112	1,035,589
1982	0	44,353	117,332	878,486	4,045	1,044,216	0	33,541	117,277	830,704	4,045	985,567
1983	0	43,961	(101,155)	487,915	7,291	438,012	0	34,698	(101,155)	450,489	7,291	391,323
1984	0	45,999	(115,088)	632,262	5,244	568,417	0	33,132	(115,092)	582,414	5,244	505,698
1985	0	50,106	139,973	854,684	4,804	1,049,567	0	54,831	139,954	810,606	4,804	1,010,195
1986	0	38,747	37,546	882,300	3,285	961,878	0	41,421	37,546	839,839	3,285	922,091
1987	0	47,815	(25,522)	897,905	6,937	927,135	0	33,195	(25,522)	863,157	6,937	877,767
1988	0	53,815	(29,747)	1,097,643	4,360	1,126,071	0	39,775	(29,747)	1,055,649	4,360	1,070,037
1989	0	49,088	(60,826)	1,382,599	7,490	1,378,351	0	42,307	(60,826)	1,339,358	7,490	1,328,329
1990	0	66,868	(15,092)	1,627,246	8,879	1,687,901	0	56,663	(15,092)	1,590,893	8,879	1,641,343
1991	0	40,564	105,176	446,148	4,560	596,448	0	34,016	105,176	446,148	4,560	589,900
1992	0	31,820	(92,123)	844,376	1,995	786,068	0	34,477	(92,123)	820,133	1,995	764,482
1993	0	27,158	(127,738)	799,143	1,676	700,239	0	28,614	(127,738)	771,146	1,676	673,698
1994	0	50,802	(88,211)	1,007,214	2,918	972,723	0	57,203	(88,211)	977,703	2,918	949,613
1995	0	48,705	(16,431)	586,829	1,669	620,772	0	36,309	(16,431)	560,695	1,669	582,242
1996	0	58,437	15,438	836,819	2,928	913,622	0	43,710	15,438	800,633	2,928	862,709
1997	0	73,656	40,852	918,124	2,076	1,034,708	0	62,275	40,852	881,843	2,076	987,046
1998	0	61,137	(106,487)	656,796	1,585	613,031	0	47,523	(106,487)	628,084	1,585	570,705
1999	0	77,334	(2,807)	1,011,608	3,279	1,089,414	0	55,514	(2,807)	974,807	3,279	1,030,793
2000	0	87,084	7,726	1,691,120	4,216	1,790,146	0	49,690	7,726	1,651,057	4,216	1,712,689
2001	0	71,588	(18,830)	1,233,862	1,211	1,287,831	0	54,742	(18,830)	1,202,670	1,211	1,239,793
2002	0	108,309	50,342	1,740,813	3,961	1,903,425	0	69,443	50,342	1,699,261	3,961	1,823,007
2003	0	106,973	(48,181)	1,825,617	10,645	1,895,054	0	57,291	(48,181)	1,789,015	10,645	1,808,770
2004	0	122,559	3,161	2,032,528	649	2,158,897	0	60,847	3,161	1,992,344	649	2,057,001
2005	0	99,523	(159,678)	1,751,799	559	1,692,203	0	53,502	(159,678)	1,711,929	559	1,606,312
2006	0	128,022	(120,122)	1,967,163	504	1,975,567	0	46,463	(120,122)	1,920,919	504	1,847,764
2007	0	139,502	118,196	1,910,800	305	2,168,803	0	59,454	118,196	1,863,410	305	2,041,365
2008	0	97,209	(4,230)	1,201,345	327	1,294,651	0	51,709	(4,230)	1,168,316	327	1,216,122
2009	0	88,574	(726)	1,169,477	1,295	1,258,620	0	43,229	(726)	1,146,258	1,295	1,190,056
2010	0	92,345	48,231	1,409,122	603	1,550,301	0	59,808	48,231	1,389,990	603	1,498,632
2011	0	114,286	(18,816)	1,695,956	742	1,792,168	0	67,210	(18,816)	1,653,798	742	1,702,934
2012	0	114,502	14,573	1,537,522	938	1,667,535	0	70,999	14,573	1,510,007	938	1,596,517
2013	0	116,975	(1,058)	1,190,711	795	1,307,423	0	69,572	(1,058)	1,162,970	795	1,232,279
2014	0	40,401	(8,000)	671,279	7,010	710,690	0	40,151	(8,000)	624,705	7,010	663,866
2015	0	40,398	0	1,584,134	7,010	1,631,542	0	40,148	0	1,555,981	7,010	1,603,139
2016	0	40,399	(2,000)	1,584,134	7,010	1,629,543	0	40,149	(2,000)	1,555,981	7,010	1,601,140
2017	0	37,494	61,309	1,584,134	7,010	1,689,947	0	37,244	61,309	1,555,981	7,010	1,661,544
2018	0	37,648	(80,817)	1,584,134	7,010	1,547,975	0	37,398	(80,817)	1,555,981	7,010	1,519,572
2019	0	37,472	50,179	1,566,859	7,010	1,661,520	0	37,222	50,179	1,539,706	7,010	1,634,117
2020	0	37,536	(366)	1,567,159	7,010	1,611,339	0	37,286	(366)	1,540,006	7,010	1,583,936
2021	0	37,619	10,725	1,567,959	7,010	1,623,313	0	37,369	10,725	1,540,806	7,010	1,595,910
2022	0	37,613	(3,483)	1,568,859	7,010	1,609,999	0	37,363	(3,483)	1,541,706	7,010	1,582,596
2023	0	37,604	(18,971)	1,569,659	7,010	1,595,302	0	37,354	(18,971)	1,542,506	7,010	1,567,899
2024	0	37,483	11,289	1,570,559	7,010	1,626,341	0	37,233	11,289	1,543,406	7,010	1,598,938
2025	0	37,546	(12,518)	1,571,359	7,010	1,603,397	0	37,296	(12,518)	1,544,206	7,010	1,575,994
2026	0	37,558	24,308	1,571,859	7,010	1,640,735	0	37,308	24,308	1,544,706	7,010	1,613,332
2027	0	37,471	(17,799)	1,572,459	7,010	1,599,141	0	37,221	(17,799)	1,545,306	7,010	1,571,738
2028	0	37,611	12,291	1,572,959	7,010	1,629,871	0	37,361	12,291	1,545,806	7,010	1,602,468
2029	0	37,538	(9,046)	1,573,659	7,010	1,609,161	0	37,288	(9,046)	1,546,506	7,010	1,581,758
2030	0	37,602	20,756	1,574,259	7,010	1,639,627	0	37,352	20,756	1,547,106	7,010	1,612,224
2031	0	37,474	(97,726)	1,575,159	7,010	1,521,917	0	37,224	(97,726)	1,548,006	7,010	1,494,514
2032	0	37,076	84,999	1,575,959	7,010	1,705,044	0	36,826	84,999	1,548,806	7,010	1,677,641
2033	0	37,281	(94,652)	1,576,759	7,010	1,526,398	0	37,031	(94,652)	1,549,606	7,010	1,498,995
2034	0	36,773	69,593	1,577,559	7,010	1,690,935	0	36,523	69,593	1,550,406	7,010	1,663,532
2035	0	36,113	(242,659)	1,578,359	7,010	1,378,823	0	35,863	(242,659)	1,551,206	7,010	1,351,420

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 5 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	Tehachapi Division						Mojave Division					
	Edmonston Pumping Plant						Alamo Powerplant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[51]	[52]	[53]	[54]	[55]	[56]	[57]	[58]	[59]	[60]	[61]	[62]	
1961	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	
1971	5,446	8	0	0	0	5,454	0	0	0	0	0	
1972	100,274	16,067	(6,558)	74,123	6,481	190,387	0	0	0	0	0	
1973	204,638	34,051	1,329	207,808	1,147	448,973	0	0	0	0	0	
1974	237,554	18,181	(15,295)	313,634	2,108	556,182	0	0	0	0	0	
1975	103,352	20,183	(693)	573,219	3,358	699,419	0	0	0	0	0	
1976	61,122	21,096	(152,171)	685,768	1,581	617,396	0	0	0	0	0	
1977	0	18,424	(116,219)	236,086	560	138,851	0	0	0	0	0	
1978	65,027	20,887	121,904	590,329	674	798,821	0	0	0	0	0	
1979	12,302	46,332	(51,299)	568,338	502	576,175	0	0	0	0	0	
1980	0	52,967	(134,009)	639,743	1,262	559,963	0	0	0	0	0	
1981	0	40,602	23,359	938,482	4,112	1,006,555	0	0	0	0	0	
1982	0	37,244	117,296	812,206	4,045	970,791	0	0	0	0	0	
1983	0	40,690	(101,155)	431,182	7,291	378,008	0	0	0	0	0	
1984	0	42,112	(115,214)	556,830	5,244	488,972	0	0	0	0	0	
1985	0	45,265	139,988	792,477	4,804	982,534	0	0	0	0	0	
1986	0	36,918	37,546	823,067	3,285	900,816	0	14,735	12,258	429,864	1,508	458,365
1987	0	29,580	(25,522)	851,322	6,937	862,317	0	11,665	(15,270)	417,870	1,239	415,504
1988	0	42,017	(29,747)	1,044,737	4,360	1,061,367	0	21,696	1,101	537,568	971	561,336
1989	0	32,270	(60,826)	1,328,041	7,490	1,306,975	0	4,686	(20,363)	716,360	1,407	702,090
1990	0	42,198	(15,092)	1,579,466	8,879	1,615,451	0	8,898	(5,916)	788,111	1,388	792,481
1991	0	33,999	105,176	441,217	4,560	584,952	0	17,908	34,422	177,308	394	230,032
1992	0	23,121	(92,123)	809,771	1,995	742,764	0	14,873	(17,115)	374,110	423	372,291
1993	0	11,946	(127,738)	759,485	1,676	645,369	0	9,304	(3,455)	308,222	443	314,514
1994	0	40,808	(88,211)	960,815	2,918	916,330	0	21,837	3,395	469,996	430	495,658
1995	0	36,001	(16,431)	542,465	1,669	563,704	0	14,139	(30,761)	384,836	427	368,641
1996	0	37,357	15,438	779,918	2,928	835,641	0	7,247	(11,410)	493,852	565	490,254
1997	0	51,475	40,852	860,798	2,076	955,201	0	20,725	38,960	537,586	507	597,778
1998	0	48,601	(106,487)	607,301	1,585	551,000	0	21,456	16,361	398,385	363	436,565
1999	0	52,726	(2,807)	947,420	3,279	1,000,618	0	26,644	(8,486)	589,756	396	608,310
2000	0	43,072	7,726	1,627,123	4,216	1,682,137	0	8,983	(10,472)	788,997	449	957,957
2001	0	39,544	(18,830)	1,187,300	1,211	1,209,225	0	14,526	3,478	709,985	452	728,441
2002	0	60,037	50,342	1,680,514	3,961	1,794,854	0	15,190	8,398	901,230	490	925,308
2003	0	53,320	(48,181)	1,771,048	10,645	1,786,832	0	13,676	(20,787)	1,035,349	355	1,028,593
2004	0	57,962	3,161	1,970,391	649	2,032,163	0	15,581	17,207	1,120,384	171	1,153,343
2005	0	40,949	(159,678)	1,693,409	559	1,575,239	0	2,561	(50,014)	1,116,158	84	1,068,789
2006	0	52,291	(120,122)	1,898,070	504	1,830,743	0	13,170	8,653	1,281,524	98	1,303,445
2007	0	65,423	118,196	1,836,977	305	2,020,901	0	17,957	(5,091)	1,076,227	103	1,089,196
2008	0	50,959	(4,230)	1,146,056	327	1,193,112	0	14,592	5,383	614,224	80	634,279
2009	0	59,186	(726)	1,125,654	1,295	1,185,409	0	25,599	(5,619)	493,685	1,100	514,765
2010	0	61,816	48,231	1,369,128	603	1,479,778	0	33,660	6,964	956,888	363	997,875
2011	0	64,370	(18,816)	1,632,033	742	1,678,329	0	34,783	(1,405)	1,220,667	500	1,254,545
2012	0	65,684	14,573	1,486,712	938	1,567,907	0	22,523	(229)	892,938	550	915,782
2013	0	69,789	(1,058)	1,141,511	795	1,211,037	0	20,563	3,278	528,595	501	552,937
2014	0	38,601	(8,000)	570,851	7,010	608,462	0	21,145	0	208,635	1,630	231,410
2015	0	38,598	0	1,536,615	7,010	1,582,223	0	21,145	0	854,155	1,630	876,930
2016	0	38,599	(2,000)	1,536,615	7,010	1,580,224	0	21,145	0	856,155	1,630	878,930
2017	0	35,694	61,309	1,536,615	7,010	1,640,628	0	20,895	33,266	858,155	1,630	913,946
2018	0	35,848	(80,817)	1,536,615	7,010	1,498,656	0	20,998	(50,078)	858,155	1,630	830,705
2019	0	35,672	50,179	1,519,140	7,010	1,612,001	0	20,924	31,508	954,752	1,630	1,008,814
2020	0	35,736	(366)	1,519,440	7,010	1,561,820	0	20,947	(3,398)	954,752	1,630	973,931
2021	0	35,819	10,725	1,520,240	7,010	1,573,794	0	20,946	(1,117)	954,752	1,630	976,211
2022	0	35,813	(3,483)	1,521,140	7,010	1,560,480	0	20,940	(3,434)	954,752	1,630	973,888
2023	0	35,804	(18,971)	1,521,940	7,010	1,545,783	0	20,939	(18,638)	954,752	1,630	956,683
2024	0	35,683	11,289	1,522,840	7,010	1,576,822	0	20,881	21,309	954,752	1,630	998,572
2025	0	35,746	(12,518)	1,523,640	7,010	1,553,878	0	20,965	(11,624)	954,752	1,630	965,723
2026	0	35,758	24,308	1,524,140	7,010	1,591,216	0	20,930	13,030	954,752	1,630	990,342
2027	0	35,671	(17,799)	1,524,740	7,010	1,549,622	0	20,861	(6,161)	954,752	1,630	971,082
2028	0	35,811	12,291	1,525,240	7,010	1,580,352	0	20,961	4,006	954,752	1,630	981,349
2029	0	35,738	(9,046)	1,525,940	7,010	1,559,642	0	20,955	(913)	954,752	1,630	976,424
2030	0	35,802	20,756	1,526,540	7,010	1,590,108	0	20,930	8,528	954,752	1,630	985,840
2031	0	35,674	(97,726)	1,527,440	7,010	1,472,398	0	20,956	(31,057)	954,752	1,630	946,281
2032	0	35,276	84,999	1,528,240	7,010	1,655,525	0	20,865	43,953	954,752	1,630	1,021,200
2033	0	35,481	(94,652)	1,529,040	7,010	1,476,879	0	20,854	(37,929)	954,752	1,630	939,307
2034	0	34,973	69,593	1,529,840	7,010	1,641,416	0	20,769	28,588	954,752	1,630	1,005,739
2035	0	34,313	(242,659)	1,530,640	7,010	1,329,304	0	20,892	(49,219)	954,752	1,630	928,055

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 6 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	Mojave Division (continued)											
	Pearblossom Pumping Plant						Mojave Siphon Powerplant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[63]	[64]	[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]	
1961	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	
1971	21	0	0	0	0	21	0	0	0	0	0	
1972	35,243	5,282	(153)	1,794	0	42,166	0	0	0	0	0	
1973	80,177	21,522	(2,700)	52,201	72	151,272	0	0	0	0	0	
1974	76,694	10,847	(11,149)	102,839	44	179,275	0	0	0	0	0	
1975	10,000	2,364	(8,397)	190,351	70	194,388	0	0	0	0	0	
1976	4,168	7,040	(16,055)	236,713	152	232,018	0	0	0	0	0	
1977	0	11,398	(17,534)	102,326	580	96,770	0	0	0	0	0	
1978	19,922	5,696	69,130	374,845	498	470,091	0	0	0	0	0	
1979	12,302	6,836	(32,518)	362,114	502	349,236	0	0	0	0	0	
1980	0	16,200	6,159	401,214	781	424,354	0	0	0	0	0	
1981	0	4,992	(36,278)	574,573	933	544,220	0	0	0	0	0	
1982	0	5,251	55,232	401,037	1,919	463,439	0	0	0	0	0	
1983	0	11,745	(26,847)	231,188	1,180	217,266	0	0	0	0	0	
1984	0	18,228	23,230	252,066	1,494	295,018	0	0	0	0	0	
1985	0	25,292	(2,815)	350,758	1,076	374,311	0	0	0	0	0	
1986	0	30,876	12,258	394,156	1,508	438,798	0	0	0	0	0	
1987	0	27,552	(15,270)	377,531	1,239	391,052	0	0	0	0	0	
1988	0	32,209	1,101	501,300	971	535,581	0	1,977	1,101	501,291	971	505,340
1989	0	31,500	(20,363)	661,189	1,407	673,733	0	29,110	(20,363)	661,100	1,407	671,254
1990	0	32,672	(5,916)	730,560	1,388	758,704	0	23,692	(5,916)	730,550	1,388	749,714
1991	0	15,209	34,774	163,913	394	214,290	0	(543)	34,774	163,913	394	198,538
1992	0	13,989	(17,451)	338,249	423	335,210	0	(13,193)	(17,451)	338,207	423	307,986
1993	0	9,779	(3,455)	255,117	443	261,884	0	(11,922)	(3,455)	255,117	443	240,183
1994	0	150	3,395	409,928	430	413,903	0	1,601	3,395	395,294	430	400,720
1995	0	6,820	(29,282)	328,882	427	306,847	0	10,458	(29,282)	321,387	427	302,990
1996	0	9,514	(11,410)	424,252	565	422,921	0	(5,577)	(11,410)	418,141	565	401,719
1997	0	(1,124)	38,960	461,563	507	499,906	0	5,171	38,960	452,525	507	497,163
1998	0	(2,087)	16,361	334,965	363	349,602	0	11,496	16,361	332,385	363	360,605
1999	0	(1,154)	(8,486)	505,624	396	496,380	0	11,065	(8,486)	498,919	396	501,894
2000	0	(23,296)	(10,472)	864,999	449	831,680	0	4,896	(10,472)	854,980	449	849,853
2001	0	(9,304)	3,478	635,316	452	629,942	0	7,403	3,478	632,420	452	643,753
2002	0	3,810	8,398	823,690	490	836,388	0	9,300	8,398	820,217	490	838,405
2003	0	2,814	(20,787)	962,488	355	944,870	0	(6,586)	(20,787)	941,713	355	914,695
2004	0	(15,558)	17,207	1,047,521	171	1,049,341	0	5,034	17,207	1,035,315	171	1,057,727
2005	0	(18,967)	(50,014)	1,043,564	84	974,667	0	827	(50,014)	1,025,453	84	976,350
2006	0	(21,986)	8,653	1,187,627	98	1,174,392	0	(845)	8,653	1,154,634	98	1,162,540
2007	0	(13,055)	(5,091)	975,802	103	957,759	0	3,060	(5,091)	956,281	103	954,353
2008	0	723	5,383	550,143	80	556,329	0	8,380	5,383	534,480	80	548,323
2009	0	3,807	(5,619)	431,289	1,100	430,577	0	10,520	(5,619)	411,075	1,100	417,076
2010	0	3,489	6,964	886,249	363	897,065	0	11,912	6,964	858,609	363	877,848
2011	0	7,953	(1,405)	1,114,556	500	1,121,604	0	13,506	(1,405)	1,080,734	500	1,093,335
2012	0	3,499	(229)	797,563	550	801,383	0	3,492	(229)	775,600	550	779,413
2013	0	6,273	3,278	466,091	501	476,143	0	12,172	3,278	460,089	501	476,040
2014	0	15,795	0	181,994	1,430	199,219	0	12,325	0	181,601	1,430	195,356
<b>2015</b>	<b>0</b>	<b>15,795</b>	<b>0</b>	<b>750,308</b>	<b>1,430</b>	<b>767,533</b>	<b>0</b>	<b>12,325</b>	<b>0</b>	<b>731,644</b>	<b>1,430</b>	<b>745,399</b>
2016	0	15,795	0	752,308	1,430	769,533	0	12,325	0	731,644	1,430	745,399
2017	0	15,545	33,266	754,256	1,430	804,497	0	12,075	33,266	733,644	1,430	780,415
2018	0	15,648	(50,078)	754,256	1,430	721,256	0	12,178	(50,078)	733,644	1,430	697,174
2019	0	15,574	31,508	852,454	1,430	900,966	0	12,104	31,508	810,872	1,430	855,914
2020	0	15,597	(3,398)	854,854	1,430	868,483	0	12,127	(3,398)	810,872	1,430	821,031
2021	0	15,596	(1,117)	854,854	1,430	870,763	0	12,126	(1,117)	810,872	1,430	823,311
2022	0	15,590	(3,434)	854,854	1,430	868,440	0	12,120	(3,434)	810,872	1,430	820,988
2023	0	15,589	(18,638)	854,854	1,430	853,235	0	12,119	(18,638)	810,872	1,430	805,783
2024	0	15,531	21,309	854,854	1,430	893,124	0	12,061	21,309	810,872	1,430	845,672
2025	0	15,615	(11,624)	854,854	1,430	860,275	0	12,145	(11,624)	810,872	1,430	812,823
2026	0	15,580	13,030	854,854	1,430	884,894	0	12,110	13,030	810,872	1,430	837,442
2027	0	15,511	(6,161)	854,854	1,430	865,634	0	12,041	(6,161)	810,872	1,430	818,182
2028	0	15,611	4,006	854,854	1,430	875,901	0	12,141	4,006	810,872	1,430	828,449
2029	0	15,605	(913)	854,854	1,430	870,976	0	12,135	(913)	810,872	1,430	823,524
2030	0	15,580	8,528	854,854	1,430	880,392	0	12,110	8,528	810,872	1,430	832,940
2031	0	15,606	(31,057)	854,854	1,430	840,833	0	12,136	(31,057)	810,872	1,430	793,381
2032	0	15,515	43,953	854,854	1,430	915,752	0	12,045	43,953	810,872	1,430	868,300
2033	0	15,504	(37,929)	854,854	1,430	833,859	0	12,034	(37,929)	810,872	1,430	786,407
2034	0	15,419	28,588	854,854	1,430	900,291	0	11,949	28,588	810,872	1,430	852,839
2035	0	15,542	(49,219)	854,854	1,430	822,607	0	12,072	(49,219)	810,872	1,430	775,155



**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 7 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	Santa Ana Division									
	Devil Canyon Powerplant						Greenspot Pump Station			
	Initial Fill Water	Opera- tional Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Opera- tional Losses	Water Supply Delivery	Total
Water Supply				Recrea- tion						
[75]	[76]	[77]	[78]	[79]	[80]	[81]	[82]	[83]	[84]	
1961	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	0	
1972	37	0	0	1,275	0	1,312	0	0	0	
1973	40,848	14,745	0	51,812	0	107,405	0	0	0	
1974	74,666	8,367	(4,925)	102,198	0	180,306	0	0	0	
1975	10,000	1,995	(6,719)	189,526	0	194,802	0	0	0	
1976	4,168	5,180	(9,182)	235,711	23	235,900	0	0	0	
1977	0	8,082	(5,235)	101,137	469	104,453	0	0	0	
1978	14,820	3,754	21,686	373,636	481	414,377	0	0	0	
1979	12,302	5,620	(27,107)	356,854	485	348,154	0	0	0	
1980	0	9,468	12,714	395,975	742	418,899	0	0	0	
1981	0	8,401	(23,448)	569,088	807	554,848	0	0	0	
1982	0	6,012	44,469	399,799	1,798	452,078	0	0	0	
1983	0	8,597	5,188	230,277	1,078	245,140	0	0	0	
1984	0	12,861	(850)	250,938	1,414	264,363	0	0	0	
1985	0	14,325	(8,791)	349,336	956	355,826	0	0	0	
1986	0	9,486	8,339	392,650	1,378	411,853	0	0	0	
1987	0	7,923	(11,335)	375,451	1,118	373,157	0	0	0	
1988	0	11,090	2,238	499,285	861	513,474	0	0	0	
1989	0	13,116	(5,487)	658,730	1,301	667,660	0	0	0	
1990	0	13,439	(4,622)	728,723	1,281	738,821	0	0	0	
1991	0	10,836	18,308	161,032	340	190,516	0	0	0	
1992	0	9,157	(9,084)	328,354	371	328,798	0	0	0	
1993	0	5,602	5,593	244,678	364	256,237	0	0	0	
1994	0	10,915	(11,045)	393,690	357	393,917	0	0	0	
1995	0	11,268	2,331	320,978	358	334,935	0	0	0	
1996	0	9,496	13,015	417,656	494	440,661	0	0	0	
1997	0	8,087	(19,685)	451,874	416	440,692	0	0	0	
1998	0	6,700	16,643	332,198	310	355,851	0	0	0	
1999	0	9,784	(4,177)	497,787	341	503,735	0	0	0	
2000	0	7,407	(11,040)	853,786	375	850,528	0	0	0	
2001	0	9,324	8,183	631,363	374	649,244	0	0	0	
2002	0	10,315	9,682	818,028	413	838,438	0	0	0	
2003	0	9,198	(18,298)	922,901	260	914,061	4,526	4,526		
2004	0	11,166	15,150	1,033,309	85	1,059,710	3,798	3,798		
2005	0	4,500	(63,441)	1,010,247	0	951,306	3,686	3,686		
2006	0	8,208	7,571	1,153,993	0	1,169,772	7,775	7,775		
2007	0	8,216	(5,872)	953,803	0	956,147	12,168	12,168		
2008	0	10,599	7,759	533,221	0	551,579	14,408	14,408		
2009	0	10,035	(5,600)	410,032	1,025	415,492	20,542	20,542		
2010	0	6,275	5,344	851,786	307	863,712	18,395	18,395		
2011	0	7,359	2,371	1,066,088	417	1,076,235	20,586	20,586		
2012	0	(1,942)	(2,225)	771,982	459	768,274	23,791	23,791		
2013	0	3,306	3,042	458,221	416	464,985	20,560	20,560		
2014	0	8,077	0	179,425	1,250	188,752	9,637	9,637		
2015	0	8,077	0	723,114	1,250	732,441	10,380	10,380		
2016	0	8,077	0	723,114	1,250	732,441	10,380	10,380		
2017	0	8,502	9,828	723,114	1,250	742,694	10,380	10,380		
2018	0	8,484	(19,777)	723,114	1,250	713,071	10,380	10,380		
2019	0	8,492	17,408	798,132	1,250	825,282	10,380	10,380		
2020	0	8,483	(17,305)	798,132	1,250	790,560	10,380	10,380		
2021	0	8,486	(398)	798,132	1,250	807,470	10,380	10,380		
2022	0	8,486	13,735	798,132	1,250	821,603	10,380	10,380		
2023	0	8,482	(8,417)	798,132	1,250	799,447	10,380	10,380		
2024	0	8,462	689	798,132	1,250	808,533	10,380	10,380		
2025	0	8,489	4,591	798,132	1,250	812,462	10,380	10,380		
2026	0	8,475	(3,819)	798,132	1,250	804,038	10,380	10,380		
2027	0	8,479	745	798,132	1,250	808,606	10,380	10,380		
2028	0	8,481	(5,355)	798,132	1,250	802,508	10,380	10,380		
2029	0	8,481	2,909	798,132	1,250	810,772	10,380	10,380		
2030	0	8,480	296	798,132	1,250	808,158	10,380	10,380		
2031	0	8,475	(1,976)	798,132	1,250	805,881	10,380	10,380		
2032	0	8,449	18,821	798,132	1,250	826,652	10,380	10,380		
2033	0	8,449	(23,419)	798,132	1,250	784,412	10,380	10,380		
2034	0	8,443	21,651	798,132	1,250	829,476	10,380	10,380		
2035	0	8,451	(31,434)	798,132	1,250	776,399	10,380	10,380		

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 8 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)														
	Santa Ana Division (continued)								West Branch, California Aqueduct						
	Crafton Hills Pump Station				Cherry Valley Pump Station				Oso Pumping Plant						
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	
[85]	[86]	[87]	[88]	[89]	[90]	[91]	[92]	[93]	[94]	[95]	[96]	[97]	[98]		
1961	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	0	2,444	133	0	0	0	2,577	
1972	0	0	0	0	0	0	0	0	63,883	6,557	(6,405)	71,991	6,481	142,507	
1973	0	0	0	0	0	0	0	0	124,461	16,995	4,029	155,317	1,075	301,877	
1974	0	0	0	0	0	0	0	0	160,860	12,702	(4,146)	209,172	2,064	380,652	
1975	0	0	0	0	0	0	0	0	93,352	23,008	7,704	374,306	3,288	501,658	
1976	0	0	0	0	0	0	0	0	56,954	15,845	(136,116)	420,708	1,429	358,820	
1977	0	0	0	0	0	0	0	0	0	4,407	(98,685)	122,447	(20)	28,149	
1978	0	0	0	0	0	0	0	0	45,105	9,061	52,774	171,139	176	278,255	
1979	0	0	0	0	0	0	0	0	0	25,355	(18,781)	145,598	0	152,172	
1980	0	0	0	0	0	0	0	0	0	24,576	(140,168)	165,931	481	50,820	
1981	0	0	0	0	0	0	0	0	0	15,254	59,637	283,264	3,179	361,334	
1982	0	0	0	0	0	0	0	0	0	23,824	61,685	360,878	2,126	448,513	
1983	0	0	0	0	0	0	0	0	0	23,601	(74,308)	166,995	6,111	122,399	
1984	0	0	0	0	0	0	0	0	0	12,461	(138,146)	272,101	3,750	150,166	
1985	0	0	0	0	0	0	0	0	0	28,257	142,219	403,097	3,728	577,301	
1986	0	0	0	0	0	0	0	0	0	22,387	25,288	393,203	1,777	442,655	
1987	0	0	0	0	0	0	0	0	0	18,164	(10,252)	433,452	5,698	447,062	
1988	0	0	0	0	0	0	0	0	0	20,461	(30,848)	507,169	3,389	500,171	
1989	0	0	0	0	0	0	0	0	0	27,914	(40,463)	611,681	6,083	605,215	
1990	0	0	0	0	0	0	0	0	0	33,666	(9,176)	791,355	7,491	823,336	
1991	0	0	0	0	0	0	0	0	0	16,460	70,754	263,909	4,166	355,289	
1992	0	0	0	0	0	0	0	0	0	8,238	(75,008)	435,661	1,572	370,463	
1993	0	0	0	0	0	0	0	0	0	2,674	(124,283)	451,263	1,233	330,887	
1994	0	0	0	0	0	0	0	0	0	18,688	(91,606)	490,819	2,488	420,389	
1995	0	0	0	0	0	0	0	0	0	21,775	14,330	157,629	1,242	194,976	
1996	0	0	0	0	0	0	0	0	0	30,121	26,848	286,066	2,363	345,398	
1997	0	0	0	0	0	0	0	0	0	30,468	1,892	323,212	1,569	357,141	
1998	0	0	0	0	0	0	0	0	0	26,851	(122,848)	208,916	1,222	114,141	
1999	0	0	0	0	0	0	0	0	0	25,690	5,679	357,664	2,883	391,916	
2000	0	0	0	0	0	0	0	0	0	33,658	18,198	668,126	3,767	723,749	
2001	0	0	0	0	0	0	0	0	0	24,551	(22,308)	477,315	759	480,317	
2002	0	0	0	0	0	0	0	0	0	44,692	41,944	779,284	3,471	869,391	
2003	0	0	2,733	2,733	0	0	116	116	0	39,495	(27,394)	735,699	10,290	758,090	
2004	0	0	3,212	3,212	0	0	841	841	0	41,947	(14,046)	850,007	478	878,386	
2005	0	0	2,727	2,727	0	0	692	692	0	38,154	(109,664)	577,251	475	506,216	
2006	0	0	6,892	6,892	0	0	807	807	0	38,534	(128,775)	616,546	406	526,711	
2007	0	0	9,038	9,038	0	0	177	177	0	46,921	123,287	760,750	202	931,160	
2008	0	0	13,728	13,728	0	0	1,042	1,042	0	36,204	(9,613)	531,832	247	558,670	
2009	0	0	16,463	16,463	0	0	1,898	1,898	0	33,295	4,893	631,969	195	670,352	
2010	0	0	17,778	17,778	0	0	5,685	5,685	0	27,788	41,267	412,240	240	481,535	
2011	0	0	19,887	19,887	0	0	9,290	9,290	0	29,227	(17,411)	411,366	242	423,424	
2012	0	0	20,614	20,614	0	0	11,010	11,010	0	42,913	14,802	593,774	388	651,877	
2013	0	0	17,526	17,526	0	0	9,445	9,445	0	49,029	(4,336)	612,912	294	657,899	
2014	0	0	9,526	9,526	0	0	5,627	5,627	0	17,406	(8,000)	362,215	5,380	377,001	
<b>2015</b>	<b>0</b>	<b>0</b>	<b>10,380</b>	<b>10,380</b>	<b>0</b>	<b>0</b>	<b>6,620</b>	<b>6,620</b>	<b>0</b>	<b>17,403</b>	<b>0</b>	<b>682,340</b>	<b>5,380</b>	<b>705,123</b>	
2016	0	0	10,380	10,380	0	0	9,440	9,440	0	17,404	(2,000)	680,340	5,380	701,124	
2017	0	0	10,380	10,380	0	0	10,060	10,060	0	14,749	28,043	678,340	5,380	726,512	
2018	0	0	10,380	10,380	0	0	10,380	10,380	0	14,800	(30,739)	678,340	5,380	667,781	
2019	0	0	10,380	10,380	0	0	9,700	9,700	0	14,698	18,671	564,388	5,380	603,137	
2020	0	0	10,380	10,380	0	0	9,700	9,700	0	14,739	3,032	564,688	5,380	587,839	
2021	0	0	10,380	10,380	0	0	9,700	9,700	0	14,823	11,842	565,488	5,380	597,533	
2022	0	0	10,380	10,380	0	0	9,700	9,700	0	14,823	(49)	566,388	5,380	586,542	
2023	0	0	10,380	10,380	0	0	9,700	9,700	0	14,815	(333)	567,188	5,380	587,050	
2024	0	0	10,380	10,380	0	0	9,700	9,700	0	14,752	(10,020)	568,088	5,380	578,200	
2025	0	0	10,380	10,380	0	0	9,700	9,700	0	14,731	(894)	568,888	5,380	588,105	
2026	0	0	10,380	10,380	0	0	9,700	9,700	0	14,778	11,278	569,388	5,380	600,824	
2027	0	0	10,380	10,380	0	0	9,700	9,700	0	14,760	(11,638)	569,988	5,380	578,490	
2028	0	0	10,380	10,380	0	0	9,700	9,700	0	14,800	8,285	570,488	5,380	598,953	
2029	0	0	10,380	10,380	0	0	9,700	9,700	0	14,733	(8,133)	571,188	5,380	583,168	
2030	0	0	10,380	10,380	0	0	9,700	9,700	0	14,822	12,228	571,788	5,380	604,218	
2031	0	0	10,380	10,380	0	0	9,700	9,700	0	14,668	(66,669)	572,688	5,380	526,067	
2032	0	0	10,380	10,380	0	0	9,700	9,700	0	14,361	41,046	573,488	5,380	634,275	
2033	0	0	10,380	10,380	0	0	9,700	9,700	0	14,577	(56,723)	574,288	5,380	537,522	
2034	0	0	10,380	10,380	0	0	9,700	9,700	0	14,154	41,005	575,088	5,380	635,627	
2035	0	0	10,380	10,380	0	0	9,700	9,700	0	13,371	(193,440)	575,888	5,380	401,199	

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 9 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	West Branch, California Aqueduct (continued)											
	Warne Powerplant						Castaic Powerplant					
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total
Water Supply				Recreation	Water Supply					Recreation		
[99]	[100]	[101]	[102]	[103]	[104]	[105]	[106]	[107]	[108]	[109]	[110]	
1961	0	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	57,364	1,788	(6,162)	71,938	6,481	131,409
1973	0	0	0	0	0	0	37,198	6,430	4,542	155,297	1,075	204,542
1974	0	0	0	0	0	0	82,364	1,772	(950)	209,136	541	292,863
1975	0	0	0	0	0	0	90,460	5,002	(1,534)	374,280	1,563	469,771
1976	0	0	0	0	0	0	55,990	(7,695)	(132,036)	420,684	1,429	338,372
1977	0	0	0	0	0	0	0	(1,485)	(102,532)	122,447	(20)	18,410
1978	0	0	0	0	0	0	45,105	(2,264)	129,523	171,139	176	343,679
1979	0	0	0	0	0	0	0	(2,339)	(20,400)	145,598	0	122,859
1980	0	0	0	0	0	0	0	991	(118,026)	165,931	481	49,377
1981	0	0	0	0	0	0	0	(44,416)	47,244	283,264	2,704	288,796
1982	0	24,468	61,169	360,878	2,126	448,641	0	(60,135)	59,069	360,878	1,187	360,999
1983	0	20,780	(74,308)	166,995	6,111	119,578	0	(33,418)	(46,904)	166,995	2,618	89,291
1984	0	13,572	(139,219)	275,212	2,208	151,773	0	(29,618)	(139,545)	275,212	2,201	108,250
1985	0	29,286	141,492	403,097	874	574,749	0	(4,622)	135,007	403,097	844	534,326
1986	0	21,579	25,288	393,203	1,777	441,847	0	(6,664)	21,520	393,203	623	408,682
1987	0	20,885	(10,252)	433,452	5,698	449,783	0	(519)	(6,241)	433,452	2,734	429,426
1988	0	23,253	(31,453)	507,169	3,389	502,358	0	12,650	(28,498)	507,169	1,359	492,680
1989	0	27,131	(40,463)	611,681	6,083	604,432	0	634	(40,154)	611,681	3,161	575,322
1990	0	34,208	(9,176)	791,355	7,491	823,878	0	(14,012)	(15,101)	786,519	3,419	760,825
1991	0	16,908	70,754	263,909	4,166	355,737	0	(871)	89,637	262,921	2,283	353,970
1992	0	9,638	(75,008)	435,661	1,572	371,863	0	(609)	(71,795)	435,661	1,543	364,800
1993	0	1,922	(124,283)	451,257	1,233	330,129	0	21,959	(77,428)	451,257	1,211	396,999
1994	0	23,151	(91,606)	490,819	2,488	424,852	0	5,205	(95,738)	490,819	2,465	402,751
1995	0	15,860	14,330	157,629	1,242	189,061	0	20,400	75,863	157,629	1,223	255,115
1996	0	21,191	26,848	286,066	2,363	336,468	0	(5,621)	19,088	286,066	2,362	301,895
1997	0	23,437	1,892	323,201	1,569	350,099	0	11,119	(1,802)	323,201	1,566	334,084
1998	0	26,864	(122,848)	208,909	1,222	114,147	0	24,544	(57,726)	208,909	1,222	176,949
1999	0	21,822	8,120	357,664	2,883	390,489	0	(3,670)	6,280	357,664	2,865	363,139
2000	0	27,237	18,198	668,126	3,767	717,328	0	(19,645)	9,320	665,926	1,556	657,157
2001	0	17,404	(22,308)	477,315	759	473,170	0	(5,949)	(16,588)	477,315	746	455,524
2002	0	35,058	41,944	779,284	3,471	859,757	0	10,071	35,623	776,136	305	822,135
2003	0	28,167	(27,394)	735,699	10,290	746,762	0	9,075	(17,034)	725,781	356	718,178
2004	0	31,034	(14,046)	850,007	478	867,473	0	9,120	(11,440)	845,960	456	844,966
2005	0	29,111	(109,664)	577,251	475	497,173	0	21,155	(61,490)	577,251	472	537,388
2006	0	23,453	(128,775)	616,546	406	511,630	0	4,173	(121,607)	616,546	396	499,508
2007	0	29,978	123,287	760,750	202	914,217	0	(1,664)	117,880	758,860	196	875,272
2008	0	36,744	(9,613)	531,832	247	559,210	0	498	(14,279)	529,852	211	516,282
2009	0	30,564	4,893	631,969	195	667,621	0	(2,825)	9,194	628,819	164	635,352
2010	0	26,930	41,267	412,240	240	480,677	0	(4,135)	40,284	409,090	207	445,446
2011	0	29,363	(17,411)	411,366	242	423,560	0	(9,084)	(22,531)	408,846	221	377,452
2012	0	28,769	14,802	593,750	388	637,709	0	10,210	16,335	590,600	375	617,520
2013	0	30,918	(4,336)	612,865	294	639,741	0	13,114	(3,811)	610,623	196	620,122
2014	0	15,496	(8,000)	362,215	5,380	375,091	0	9,819	(5,000)	361,308	2,330	368,457
2015	0	15,493	0	682,340	5,380	703,213	0	9,817	0	680,450	2,330	692,597
2016	0	15,494	(2,000)	680,340	5,380	699,214	0	9,818	(2,000)	678,450	2,330	688,598
2017	0	12,839	28,043	678,340	5,380	724,602	0	6,554	28,043	676,450	2,330	713,377
2018	0	12,890	(30,739)	678,340	5,380	665,871	0	6,605	(30,739)	676,450	2,330	654,646
2019	0	12,788	18,671	564,388	5,380	601,227	0	6,503	18,671	562,498	2,330	590,002
2020	0	12,829	3,032	564,688	5,380	585,929	0	6,544	3,032	562,798	2,330	574,704
2021	0	12,913	11,842	565,488	5,380	595,623	0	6,628	11,842	563,598	2,330	584,398
2022	0	12,913	(49)	566,388	5,380	584,632	0	6,628	(49)	564,498	2,330	573,407
2023	0	12,905	(333)	567,188	5,380	585,140	0	6,620	(333)	565,298	2,330	573,915
2024	0	12,842	(10,020)	568,088	5,380	576,290	0	6,557	(10,020)	566,198	2,330	565,065
2025	0	12,821	(894)	568,888	5,380	586,195	0	6,536	(894)	566,998	2,330	574,970
2026	0	12,868	11,278	569,388	5,380	598,914	0	6,583	11,278	567,498	2,330	587,689
2027	0	12,850	(11,638)	569,988	5,380	576,580	0	6,565	(11,638)	568,098	2,330	565,355
2028	0	12,890	8,285	570,488	5,380	597,043	0	6,605	8,285	568,598	2,330	585,818
2029	0	12,823	(8,133)	571,188	5,380	581,258	0	6,538	(8,133)	569,298	2,330	570,033
2030	0	12,912	12,228	571,788	5,380	602,308	0	6,627	12,228	569,898	2,330	591,083
2031	0	12,758	(66,669)	572,688	5,380	524,157	0	6,473	(66,669)	570,798	2,330	512,932
2032	0	12,451	41,046	573,488	5,380	632,365	0	6,166	41,046	571,598	2,330	621,140
2033	0	12,667	(56,723)	574,288	5,380	535,612	0	6,382	(56,723)	572,398	2,330	524,387
2034	0	12,244	41,005	575,088	5,380	633,717	0	5,959	41,005	573,198	2,330	622,492
2035	0	11,461	(193,440)	575,888	5,380	399,289	0	5,176	(193,440)	573,998	2,330	388,064

**TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities**

(in acre-feet)

Sheet 10 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Coastal Branch, California Aqueduct							
	Las Perillas and Badger Hill Pumping Plants				Devil's Den, Bluestone, and Polonio Pass Pumping Plants			
	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total
[111]	[112]	[113]	[114]	[115]	[116]	[117]	[118]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	210	873	79,039	80,122	0	0	0	0
1969	0	1,042	62,064	63,106	0	0	0	0
1970	0	638	83,649	84,287	0	0	0	0
1971	0	3,455	110,971	114,426	0	0	0	0
1972	0	1,745	121,755	123,500	0	0	0	0
1973	0	5,479	78,645	84,124	0	0	0	0
1974	0	7,344	78,174	85,518	0	0	0	0
1975	0	5,819	85,216	91,035	0	0	0	0
1976	0	6,562	90,058	96,620	0	0	0	0
1977	0	5,777	40,579	46,356	0	0	0	0
1978	0	9,085	92,604	101,689	0	0	0	0
1979	0	10,896	123,155	134,051	0	0	0	0
1980	0	9,449	111,379	120,828	0	0	0	0
1981	0	13,232	109,754	122,986	0	0	0	0
1982	0	7,984	95,776	103,760	0	0	0	0
1983	0	5,710	100,518	106,228	0	0	0	0
1984	0	5,740	126,387	132,127	0	0	0	0
1985	0	7,563	120,823	128,386	0	0	0	0
1986	0	8,719	131,599	140,318	0	0	0	0
1987	0	11,363	128,080	139,443	0	0	0	0
1988	0	12,831	120,969	133,800	0	0	0	0
1989	0	11,454	116,801	128,255	0	0	0	0
1990	0	13,022	109,802	122,824	0	0	0	0
1991	0	5,802	1,496	7,298	0	0	0	0
1992	0	7,893	79,635	87,528	0	0	0	0
1993	0	9,282	94,921	104,203	0	0	0	0
1994	0	8,515	87,158	95,673	0	0	0	0
1995	0	6,986	94,536	101,522	0	0	0	0
1996	0	9,663	114,630	124,293	0	0	0	0
1997	527	8,343	110,428	119,298	527	0	8,538	9,065
1998	0	8,415	109,400	117,815	0	0	22,210	22,210
1999	0	2,453	120,061	122,514	0	303	23,880	24,183
2000	0	(429)	120,313	119,884	0	0	26,703	26,703
2001	0	(742)	87,915	87,173	0	0	23,229	23,229
2002	0	638	99,783	100,421	0	(151)	31,991	31,840
2003	0	161	101,113	101,274	0	284	31,421	31,705
2004	0	492	104,144	104,636	0	480	33,870	34,350
2005	0	1,484	103,178	104,662	0	573	27,595	28,168
2006	0	1,994	115,433	117,427	0	2,034	27,484	29,518
2007	0	3,355	131,590	134,945	0	293	31,516	31,809
2008	0	3,696	107,239	110,935	0	(30)	21,795	21,765
2009	0	2,242	102,509	104,751	0	(3,078)	19,253	16,175
2010	0	4,050	106,590	110,640	0	272	21,532	21,804
2011	0	3,994	113,647	117,641	0	533	24,869	25,402
2012	0	7,411	109,383	116,794	0	589	23,418	24,007
2013	0	7,637	110,714	118,351	0	295	21,699	21,994
2014	0	802	79,994	80,796	0	212	22,234	22,446
<b>2015</b>	<b>0</b>	<b>802</b>	<b>98,315</b>	<b>99,117</b>	<b>0</b>	<b>212</b>	<b>40,872</b>	<b>41,084</b>
2016	0	802	98,315	99,117	0	212	40,872	41,084
2017	0	802	98,315	99,117	0	212	40,872	41,084
2018	0	802	98,315	99,117	0	212	40,872	41,084
2019	0	802	99,108	99,910	0	212	39,665	39,877
2020	0	802	99,108	99,910	0	212	39,665	39,877
2021	0	802	99,108	99,910	0	212	39,665	39,877
2022	0	802	99,108	99,910	0	212	39,665	39,877
2023	0	802	99,108	99,910	0	212	39,665	39,877
2024	0	802	99,108	99,910	0	212	39,665	39,877
2025	0	802	99,108	99,910	0	212	39,665	39,877
2026	0	802	99,108	99,910	0	212	39,665	39,877
2027	0	802	99,108	99,910	0	212	39,665	39,877
2028	0	802	99,108	99,910	0	212	39,665	39,877
2029	0	802	99,108	99,910	0	212	39,665	39,877
2030	0	802	99,108	99,910	0	212	39,665	39,877
2031	0	802	99,108	99,910	0	212	39,665	39,877
2032	0	802	99,108	99,910	0	212	39,665	39,877
2033	0	802	99,108	99,910	0	212	39,665	39,877
2034	0	802	99,108	99,910	0	212	39,665	39,877
2035	0	802	99,108	99,910	0	212	39,665	39,877

**TABLE B-7 Reconciliation of Capital Costs  
Allocated to Water Supply and Power Generation**

(in thousands of dollars)

Item	Project Costs Allocated to Water Supply and Power Generation							Capital Costs Allocated to Other Purposes	Total State Water Project Capital Cost
	Misc. Income Credited to Construction (a)	Allowance for Future Price Escalation (b)	Costs of Construction of Delivery Structures (c)	Costs of Requested Excess Capacity and Future Enlargement (d)	Capital Cost Component of Delta Water Charge (e)	Capital Cost Component of Transportation Water Charge (f)	Water Supply and Power Total (g)		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
<b>CONSERVATION FACILITIES</b>									
Upper Feather Division									
Frenchman Dam and Lake	180	0	0	0	601	0	781	2,876	3,658
Grizzly Valley Dam and Lake Davis	65	0	0	0	54	0	119	8,872	8,991
Antelope Dam and Lake	1	0	0	0	0	0	1	5,864	5,865
Abbey Bridge Dam and Reservoir	0	0	0	0	0	0	0	520	520
Dixie Refuge Dam and Reservoir	0	0	0	0	0	0	0	236	236
Total, Upper Feather Division	246	0	0	0	656	0	902	18,368	19,270
Oroville Division									
Multipurpose Facilities	116,970	0	0	0	462,761	0	579,731	98,586	678,316
Specific Power Facilities	230	0	0	0	173,459	0	173,689	(915)	172,774
Total, Oroville Division	117,200	0	0	0	636,220	0	753,420	97,670	851,090
California Aqueduct									
North San Joaquin Division	1,210	0	0	0	86,144	0	87,354	3,384	90,738
San Luis Division	13,152	0	0	0	129,464	0	142,616	5,304	147,919
Total, California Aqueduct	14,362	0	0	0	215,608	0	229,970	8,687	238,657
Delta Facilities	37,311	0	0	0	348,134	0	385,445	23,045	408,489
Planning and Pre-operation	5,302	0	0	0	57,086	0	62,388	0	62,388
<b>TOTAL, CONSERVATION FACILITIES</b>	<b>174,421</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,257,703</b>	<b>0</b>	<b>1,432,123</b>	<b>147,770</b>	<b>1,579,894</b>
<b>TRANSPORTATION FACILITIES</b>									
Upper Feather Division									
Grizzly Valley Pipeline	1	0	315	0	0	341	657	0	657
North Bay Aqueduct	465,371	0	676	0	0	112,661	578,708	0	578,708
South Bay Aqueduct	200,790	0	3,661	0	0	172,187	376,639	23,706	400,345
California Aqueduct									
North San Joaquin Division	7,843	0	108	0	0	208,128	216,079	7,531	223,610
San Luis Division	17,659	0	0	0	0	146,363	164,022	8,683	172,706
South San Joaquin Division	15,239	0	4,751	2,093	0	308,785	330,868	17,714	348,583
Tehachapi Division	205	0	0	5,230	0	358,918	364,353	20,796	385,149
Mojave Division	(1,336)	0	1,686	0	0	336,095	336,445	39,964	376,409
Santa Ana Division	(43,817)	0	6,079	5,331	0	400,936	368,529	79,808	448,337
West Branch	39,857	0	461	37	0	496,429	536,784	32,866	569,650
Coastal Branch	33,179	0	176	0	0	471,191	504,546	0	504,546
Total, California Aqueduct	68,830	0	13,260	12,691	0	2,726,845	2,821,627	207,363	3,028,990
<b>TOTAL, TRANSPORTATION FACILITIES</b>	<b>734,993</b>	<b>0</b>	<b>17,912</b>	<b>12,691</b>	<b>0</b>	<b>3,012,034</b>	<b>3,777,631</b>	<b>231,068</b>	<b>4,008,699</b>
EAST BRANCH ENLARGEMENT	0	0	0	0	0	461,828	461,828	0	461,828
EAST BRANCH EXTENSION	0	0	0	0	0	373,385	373,385	0	373,385
COASTAL POWER ALLOCATION	0	0	0	0	0	30,708	30,708	0	30,708
SAN JOAQUIN DRAINAGE FACILITIES	0	0	0	0	0	0	0	101,121	101,121
OFF-AQUEDUCT	0	0	0	0	0	491,574	491,574	0	491,574
POWER GENERATION FACILITIES	0	0	0	0	14,095	85,843	99,938	0	99,938
SMALL HYDRO	0	0	0	0	34,686	0	34,686	0	34,686
POWER GENERATION FACILITIES	0	0	0	0	0	0	0	558,395	558,395
LAND PURCHASE - KERN WATER BANK	0	0	0	0	0	0	0	130,000	130,000
UNASSIGNED/MISCELLANEOUS	0	0	0	0	0	0	0	0	0
DAVIS-GRUNSKY	0	0	0	0	0	0	0	0	0
<b>TOTAL THROUGH 2023</b>	<b>909,414</b>	<b>0</b>	<b>17,912</b>	<b>12,691</b>	<b>1,306,484</b>	<b>4,455,372</b>	<b>6,701,873</b>	<b>1,168,355</b>	<b>7,870,228</b>

(a) Miscellaneous project receipts that are applied for accounting purposes to reduce the capital costs of the particular facilities.

(b) These allowances are included for planning the future financial program, but not for determining current water charges.

(c) See Table B-8.

(d) See Table B-9.

(e) See Table B-13.

(f) See Table B-10. Mojave Division total reduced by \$85,843,000 for costs included in "Small Hydro Power Generation Facilities" line



**TABLE B-8 SWP Capital Costs of Requested Delivery Structures**

Project Service Area and Water Supply Contractors	(in dollars)						
	Calendar Year Capital Costs (a)						Total
	1952-2011	2012	2013	2014	2015	2016	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
<b>FEATHER RIVER AREA</b>							
County of Butte	261,979	0	0	0	0	0	261,979
Plumas County Flood Control and Water Conservation District	8,723	0	0	0	0	0	8,723
Thermalito Irrigation District (b)	43,939	0	0	0	0	0	43,939
<b>Subtotal</b>	<b>314,641</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>314,641</b>
<b>NORTH BAY AREA</b>							
Napa County Flood Control and Water Conservation District	13,590	0	0	0	0	0	13,590
Solano County Water Agency	662,113	0	0	0	0	0	662,113
<b>Subtotal</b>	<b>675,703</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>675,703</b>
<b>SOUTH BAY AREA</b>							
Alameda County Flood Control and Water Conservation District, Zone 7 (d)	1,527,905	354,768		15,000	15,000	0	1,912,673
Alameda County Water District (d)	613,576	17,000		0	0	0	630,576
Santa Clara Valley Water District	21,500	0	0	20,000	10,000	0	51,500
San Francisco Water Department (b)	1,066,680	0	0	0	0	0	1,066,680
<b>Subtotal</b>	<b>3,229,661</b>	<b>371,768</b>	<b>0</b>	<b>35,000</b>	<b>25,000</b>	<b>0</b>	<b>3,661,429</b>
<b>CENTRAL COASTAL AREA</b>							
San Luis Obispo County Flood Control and Water Conservation District	26,204	0	0	0	0	0	26,204
Santa Barbara County Flood Control and Water Conservation District	67,058	0	0	0	0	0	67,058
<b>Subtotal</b>	<b>93,262</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>93,262</b>
<b>SAN JOAQUIN VALLEY AREA</b>							
Castaic Lake Water Agency	82,567	0	0	0	0	0	82,567
County of Kings	17,206	4	4	10,000	10,000	0	37,214
Dudley Ridge Water District	304,541	0	0	30,000	15,000	0	349,541
Empire West Side Irrigation District	6,358	0	0	0	0	0	6,358
Green Valley Water District (c)	5,292	0	0	0	0	0	5,292
Kern County Water Agency	3,445,444	415,782	129,193	40,000	50,000	0	4,080,419
Oak Flat Water District	97,643	0	0	0	0	0	97,643
Tracy Golf and Country Club (c)	6,932	0	0	0	0	0	6,932
Tulare Lake Basin Water Storage District	277,483	0	0	0	0	0	277,483
Veterans Administration Cemetery (b)	3,342	0	0	0	0	0	3,342
<b>Subtotal</b>	<b>4,246,808</b>	<b>415,786</b>	<b>129,197</b>	<b>80,000</b>	<b>75,000</b>	<b>0</b>	<b>4,946,791</b>
<b>SOUTHERN CALIFORNIA AREA</b>							
Antelope Valley-East Kern Water Agency	936,779	101,418	57,721	110,000	50,000	0	1,255,918
Castaic Lake Water Agency	375,593	0	0	0	0	0	375,593
Coachella Valley Water District	14,206	0	0	0	0	0	14,206
Crestline-Lake Arrowhead Water Agency	25,298	0	0	0	0	0	25,298
Desert Water Agency	23,438	0	0	0	0	0	23,438
Littlerock Creek Irrigation District	23,732	0	0	0	0	0	23,732
Mojave Water Agency	295,615	13,415	12	0	0	0	309,042
Palmdale Water District	34,173	0	0	0	0	0	34,173
San Bernardino Valley Municipal Water District	960,685	0	0	0	0	0	960,685
San Gabriel Valley Municipal Water District	131,052	0	0	0	0	0	131,052
San Geronio Pass Water Agency	118,558	0	1,096	15,000	20,000	0	154,654
The Metropolitan Water District of Southern California	4,814,078	2,012	1,519	10,000	5,000	0	4,832,609
Ventura County Flood Control District	79,699	0	0	0	0	0	79,699
<b>Subtotal</b>	<b>7,832,906</b>	<b>116,845</b>	<b>60,348</b>	<b>135,000</b>	<b>75,000</b>	<b>0</b>	<b>8,220,099</b>
<b>TOTAL</b>	<b>16,392,981</b>	<b>904,399</b>	<b>189,545</b>	<b>250,000</b>	<b>175,000</b>	<b>0</b>	<b>17,911,925</b>

- (a) Approximate only, not to be construed as invoice amounts.
- (b) Not a SWP water supply contractor.
- (c) Not a SWP water supply contractor, but has contracted for water.
- (d) South Bay Aqueduct Enlargement and Improvement actual costs for 2012.

**TABLE B-9 Capital Costs of Requested Excess Peaking Capacity**

(in dollars unless otherwise indicated)

Sheet 1 of 2

Calendar Year	Total Advance Payments and Credits for Excess Capacity [1]	Total Incremental Costs for Excess Capacity [2]	Over payment (+) or Under payment (-) (a) [3]	Annual Surplus Money Investment Fund Interest Rate (b) [4]		Net Over or Underpayment With Interest (c) [6]
				Jan-Jun	Jul-Dec [5]	
<b>THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA</b>						
1965	0	158,000	(158,000)	3.968%	4.184%	(163,412)
1966	8,056,000	435,800	7,620,200	4.540%	5.057%	7,701,103
1967	9,094,963	1,878,270	7,216,693	4.815%	4.744%	15,524,533
1968	1,523,252	2,887,351	(1,364,099)	5.330%	5.540%	14,959,187
1969	8,310,651	3,059,310	5,251,341	5.946%	6.389%	21,369,973
1970	3,426,736	2,397,102	1,029,634	7.071%	7.125%	23,986,083
1971	1,086,045	1,146,648	(60,603)	5.154%	5.580%	25,238,017
1972	(4,244,807)	487,394	(4,732,201)	4.477%	4.977%	21,532,965
1973	(15,913,829)	25,041	(15,938,870)	6.023%	8.717%	6,014,116
1974	0	37,775	(37,775)	9.222%	10.351%	6,576,393
1975	0	2,085	(2,085)	7.089%	6.791%	7,038,515
1976	0	0	0	6.048%	6.021%	7,469,662
1977	0	0	0	5.788%	6.182%	7,923,403
1978	0	0	0	7.171%	8.096%	8,539,736
1979	0	0	0	8.979%	9.671%	9,354,605
1980	0	0	0	11.500%	11.500%	10,461,314
Total	11,339,011	12,514,776	(1,175,765)	-	-	10,461,314
<b>SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT</b>						
1967	0	25,730	(25,730)	4.815%	4.744%	(26,611)
1968	184,422	44,053	140,369	5.330%	5.540%	117,587
1969	49,052	38,075	10,977	5.946%	6.389%	136,751
1970	44,911	17,959	26,952	7.071%	7.125%	175,186
1971	61,588	5,900	55,688	5.154%	5.580%	242,927
1972	(20,263)	6,835	(27,098)	4.477%	4.977%	226,230
1973	(180,465)	0	(180,465)	6.023%	8.717%	49,198
1974	0	0	0	9.222%	10.351%	54,130
1975	0	0	0	7.089%	6.791%	57,952
1976	0	0	0	6.048%	6.021%	61,501
1977	0	0	0	5.788%	6.182%	65,237
1978	0	0	0	7.171%	8.096%	70,312
1979	0	0	0	8.979%	9.671%	77,021
1980	0	0	0	11.500%	11.500%	86,133
Total	139,245	138,552	693	-	-	86,133
<b>ANTELOPE VALLEY-EAST KERN WATER AGENCY</b>						
1968	85,495	1,645	83,850	5.330%	5.540%	86,962
1969	52,625	6,326	46,299	5.946%	6.389%	140,964
1970	101,648	15,076	86,572	7.071%	7.125%	243,222
1971	34,062	11,748	22,314	5.154%	5.580%	279,673
1972	(12,794)	2,018	(14,812)	4.477%	4.977%	277,552
1973	(205,354)	308	(205,662)	6.023%	8.717%	77,288
1974	0	96	(96)	9.222%	10.351%	84,933
1975	0	0	0	7.089%	6.791%	90,929
1976	0	190	(190)	6.048%	6.021%	96,300
1977	0	0	0	5.788%	6.182%	102,150
1978	0	0	0	7.171%	8.096%	110,096
1979	0	0	0	8.979%	9.671%	120,601
1980	0	0	0	11.500%	11.500%	134,869
Total	55,682	37,407	18,275	-	-	134,869

- (a) Overpayment or underpayment for each calendar year - column (1) minus column (2).
- (b) Interest rates shown are annual rates. Interest is credited daily at applicable rates on funds deposited in the State's Surplus Money Investment Fund.
- (c) Amounts shown are end-of-year balances. Interest on overpayments is credited at applicable Surplus Money Investment Fund Interest Rates Shown in columns (4) and (5). Interest on underpayments is charged at the 1980 Project Interest Rate of 4.584 percent.

**TABLE B-9 Capital Costs of Requested Excess Peaking Capacity**

(in dollars)

Sheet 2 of 2

Reach Number	ANNUAL REQUIRED ADVANCE OF FUNDS													Reach Total
	Incremental Costs and Advance Payments by Calendar Year													
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1981	
	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
<b>THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA</b>														
<i>Incremental Costs</i>														
8C		1,000	1,000											2,000
8D		43,500	43,500											87,000
9		27,000	27,000	13,500										67,500
10A		29,700	29,700	14,800										74,200
11B	10,100	18,300	18,300	9,200										55,900
12D	1,800			19,300	25,800	12,900								59,800
12E	1,800			12,400	18,800	10,800								43,800
13B				12,600	37,800	31,600								82,000
14A	2,500	500	11,100	80,216	107,504	124,069	37,519	6,413	381	87				370,289
14B	1,200	1,800		19,100	19,100	12,800								54,000
14C	1,800	900		13,500	13,500	9,000								38,700
15A	700		14,000	66,947	133,357	128,099	54,821	5,327	946	2,076				406,273
16A	700		18,900	137,894	182,000	211,608	133,927	26,203	5,767	6,156				723,155
17E		51,500	444,600	537,247	860,024	998,985	699,281	193,286	17,947	29,456	2,085			3,834,411
17F	109,100	261,600	261,600	261,600	261,600	239,500								1,395,000
25			964,270	1,650,947	1,426,925	673,041	221,100	256,165						5,192,448
28J		304,612	13,706	296,668	65,966	230,169	1,209,586	2,017,134	235,900	4,900				4,378,641
Total	129,700	740,412	1,891,976	3,184,019	3,125,276	2,627,271	2,356,234	2,504,528	260,941	42,675	2,085			16,865,117
<i>Current Adjustment</i>														
8C through 25	0	8,056,000	9,094,963	1,523,252	8,310,651	3,426,736	1,086,045	(4,244,807)	(14,381,396)				(356,668)	12,514,776
28J								(1,532,433)					(10,104,646)	(11,637,079)
	0	1,240,000	1,483,180	2,469,325	(927,035)	1,729,160	3,215,258	2,967,475	1,690,000	(9,488,722)				4,378,641
										(2,721,803)				(2,721,803)
5. Net Required Advance of Funds	0	9,296,000	10,578,143	3,992,577	7,383,616	5,155,896	4,301,303	(1,277,332)	(14,233,829)	(12,210,525)			(h) (10,461,314)	2,524,535
<b>SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT</b>														
<i>Incremental Costs</i>														
25			25,730	44,053	38,075	17,959	5,900	6,835						138,552
			25,730	44,053	38,075	17,959	5,900	6,835						138,552
<i>Current Adjustments</i>														
1. Advance Payments Applied to Incremental Costs (d)			0	184,422	49,052	44,911	61,588	(20,263)	(174,133)				(7,025)	138,552
2. Interest Credit									(6,332)				(79,108)	(85,440)
3. Net Required Advance of Funds			0	184,422	49,052	44,911	61,588	(20,263)	(180,465)				(h) (86,133)	53,112
<b>ANTELOPE VALLEY-EAST KERN WATER AGENCY</b>														
<i>Incremental Costs</i>														
29A				1,645	6,326	13,376	10,048	2,018	308	96		190		34,007
29F						1,700	1,700							3,400
				1,645	6,326	15,076	11,748	2,018	308	96		190		37,407
<i>Current Adjustment</i>														
1. Advance Payments Applied to Incremental Costs (d)				85,495	52,625	101,648	34,062	(12,794)	(189,120)	0	0		(34,509)	37,407
2. Interest Credit									(16,234)				(100,360)	(116,594)
3. Net Required Advance of Funds				85,495	52,625	101,648	34,062	(12,794)	(205,354)	0	0		(h) (134,869)	(79,187)

(d) Actual payments are shown for 1965 through 1976 with 1981 adjusted to reflect overpayments and underpayments without interest for prior years.  
 (e) Interest for overpayments and underpayments under provisions of Amendment 2 of the contract.  
 (f) Actual payments are shown for 1965 through 1973 with 1974 adjusted to reflect overpayments and underpayments without interest for prior years.  
 (g) Interest for overpayments and underpayments under provisions of Amendment 5 of the contract.  
 (h) Amounts in excess of incremental costs, under the provisions of the contract, reduce the Transportation Charge capital cost component of the Agency's Statement of Charges for January 1981.

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 1 of 8

Calendar Year	UPPER FEATHER DIVISION	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT			
		Reach 1	Reach 2	Reach 3A	Reach 3B	Total	Reach 1	Reach 2	Reach 4	Reach 5
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
1952	0	0	0	0	0	0	97	34	30	57
1953	0	0	0	0	0	0	477	166	144	297
1954	0	0	0	0	0	0	1,466	508	437	959
1955	0	0	0	0	0	0	1,944	674	560	1,266
1956	0	0	0	0	0	0	18,789	6,515	5,090	12,545
1957	0	13,290	3,391	0	9,953	26,634	45,090	15,639	12,285	33,218
1958	2	19,202	5,011	0	25,798	50,011	195,985	80,981	7,714	21,930
1959	14	7,517	2,118	0	17,653	27,288	496,140	148,516	24,945	17,118
1960	28	8,797	4,292	0	4,838	17,927	1,130,378	67,351	71,779	68,028
1961	10	1,551	10,318	0	2,526	14,395	3,273,247	180,596	307,885	74,398
1962	32	217	(1,751)	0	414	(1,120)	1,548,884	203,535	695,446	35,102
1963	51	2,510	(1,063)	0	983	2,430	480,716	69,182	2,284,291	206,587
1964	7,791	39,879	12,046	0	21,934	73,859	2,549,118	15,903	181,900	264,410
1965	3,139	72,793	17,900	0	170,361	261,054	807,505	153,454	85,425	447,830
1966	(48)	59,615	12,972	0	438,949	511,536	898,074	149,529	142,096	1,690,200
1967	47	47,257	11,597	0	1,551,023	1,609,877	607,614	50,423	293,304	3,496,284
1968	51,573	70,586	19,560	0	831,158	921,304	965,119	19,543	89,300	2,931,101
1969	234,232	63,650	23,628	0	46,428	133,706	455,173	9,618	3,860	896,727
1970	16,227	59,090	42,733	0	9,415	111,238	52,481	3,380	10,517	154,358
1971	27,204	20,819	31,516	0	8,480	60,815	24,505	4,645	5,035	20,395
1972	9	15,538	12,952	0	10,058	38,548	26,918	825	2,945	26,090
1973	25	18,488	29,018	0	39,878	87,384	24,468	4,010	6,016	12,708
1974	45	67,352	29,978	0	134,332	231,662	17,108	1,192	1,765	65,587
1975	21	62,855	73,112	0	45,091	181,058	57,619	561	1,165	7,291
1976	51	52,419	75,611	218	13,168	141,416	104,242	2,846	8,915	12,701
1977	28	53,274	65,662	2,240	23,138	144,314	176,062	3,625	3,225	16,158
1978	38	61,936	57,158	2,955	28,987	151,036	264,581	4,494	3,668	14,028
1979	23	316,620	91,367	3,953	62,240	474,180	111,106	17,151	8,515	31,725
1980	26	422,804	111,600	19,910	96,125	650,439	368,942	17,708	8,249	38,045
1981	34	430,992	147,295	(10,752)	43,157	610,692	(145,428)	3,600	6,533	12,448
1982	11	934,812	357,720	(7,165)	134,408	1,419,775	(44,778)	18,971	7,451	37,824
1983	19	1,091,091	1,076,627	2,628	517,615	2,687,961	429,225	73,925	38,185	72,415
1984	26	1,875,968	2,317,661	3,290	1,068,363	5,265,282	506,951	36,354	9,610	92,846
1985	29	2,248,491	7,849,886	27,815	3,416,370	13,542,562	34,103	2,822	5,034	27,138
1986	31	16,420,238	10,020,277	1,309,599	1,819,349	29,569,463	85,732	14,715	17,144	13,982
1987	32	11,873,826	7,214,307	1,628,932	1,670,596	22,387,661	126,377	15,693	27,881	32,931
1988	55	3,287,756	1,648,431	1,015,971	686,821	6,638,979	290,505	36,744	51,786	25,078
1989	44	1,056,583	950,985	224,567	374,886	2,607,021	130,609	16,848	35,518	12,582
1990	63	493,522	537,881	145,694	71,938	1,249,035	275,732	32,387	99,251	40,263
1991	54	76,599	17,130	24,846	70,542	189,117	1,153,109	26,900	53,613	21,889
1992	42	56,492	6,525	18,333	37,778	119,128	401,906	53,036	61,799	51,386
1993	30	104,317	24,579	40,129	82,032	251,057	313,476	55,679	79,149	39,293
1994	14	68,065	13,463	27,107	45,909	154,544	(211,712)	29,017	362,585	36,350
1995	3	26,002	5,920	7,337	20,617	59,876	265,751	42,516	48,189	21,436
1996	0	14,790	3,334	6,614	14,606	39,344	139,573	13,049	25,751	10,677
1997	3	67,264	35,545	38,585	(13,571)	127,823	203,476	31,135	36,986	16,906
1998	7	15,410	6,392	6,797	10,396	38,995	67,974	6,120	14,731	4,616
1999	2	71,950	35,515	33,879	32,613	173,957	162,161	25,329	35,716	24,347
2000	24	29,992	8,327	11,710	4,156	54,185	100,654	15,688	24,144	19,652
2001	20	10,597	3,904	3,892	1,954	20,347	436,756	4,272	118,836	4,207
2002	14	27,018	18,971	15,254	4,614	65,857	3,068,535	5,648	329,244	64,425
2003	0	14,733	9,243	4,658	46,313	74,947	4,465,569	200,125	199,457	360,387
2004	0	23,929	2,214	2,341	145,290	173,774	1,257,335	120,340	131,702	99,547
2005	0	89,369	216	9	33,947	123,541	1,224,486	119,298	260,893	(81)
2006	5	28,336	298	145	879,439	908,219	2,840,723	68,417	259,635	572
2007	0	61,402	40	35	3,219,048	3,280,524	3,069,791	15,211	70,835	1,915
2008	4	75,166	6,097	5,347	7,878,430	7,965,040	5,592,562	35,913	169,940	5,124
2009	13	27,617	866	463	1,188,847	1,217,792	9,803,255	1,029,805	1,545,796	2,406
2010	0	5,236	259	240	395,413	401,149	6,234,944	104,404	441,736	14,866,232
2011	1	11,210	5,672	5,037	149,646	171,566	9,878,571	1,578,705	3,734,755	3,419,894
2012	0	404,424	4,934	15,200	222,378	646,936	7,249,013	764,705	2,261,301	99,746
2013	0	560,774	10,873	25,080	257,110	853,837	2,299,399	933,573	638,338	283,535
2014	0	1,028,652	3,765	6,812	494,520	1,533,749	1,789,873	111,097	404,431	20,979
2015	0	373,150	0	3,448	179,298	555,896	186,598	41,284	165,135	13,851
2016	0	161,373	0	2,448	77,075	240,896	46,297	9,884	39,536	4,939
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>341,149</b>	<b>44,705,206</b>	<b>33,085,878</b>	<b>4,675,601</b>	<b>28,874,832</b>	<b>111,341,516</b>	<b>78,432,951</b>	<b>6,925,793</b>	<b>16,079,133</b>	<b>30,458,880</b>

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 2 of 8

Calendar Year	SOUTH BAY AQUEDUCT (continued)					CALIFORNIA AQUEDUCT NORTH SAN JOAQUIN DIVISION			
	Reach 6	Reach 7	Reach 8	Reach 9	Total	Reach 1	Reach 2A	Reach 2B	Subtotal
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1952	8	66	72	132	496	4,012	3,279	1,499	8,790
1953	38	327	336	640	2,425	10,559	8,589	3,964	23,112
1954	123	1,005	1,003	1,954	7,455	13,796	11,163	5,179	30,138
1955	160	1,293	1,149	2,454	9,500	7,370	5,952	2,760	16,082
1956	1,559	11,959	11,043	28,372	95,872	9,880	5,020	2,398	17,298
1957	3,659	28,675	27,385	563,114	729,065	11,953	5,456	2,612	20,021
1958	2,243	17,872	17,385	560,904	904,994	18,585	17,191	7,994	43,770
1959	357	3,200	3,568	149,874	843,718	123,170	100,306	45,510	268,986
1960	1,102	2,944	4,498	359,749	1,705,529	191,408	102,136	48,968	342,512
1961	4,726	18,325	22,765	(1,367)	3,880,575	153,765	195,947	42,843	392,555
1962	17,285	160,939	178,242	209,042	3,048,485	612,258	491,225	168,218	1,271,701
1963	265,414	1,250,386	939,832	129,902	5,626,310	1,993,284	1,525,734	684,095	4,203,113
1964	100,603	1,716,371	2,327,770	2,947,522	10,103,597	4,674,280	2,369,858	700,074	7,744,212
1965	42,345	368,476	637,266	1,921,844	4,464,145	5,877,189	6,873,699	2,975,719	15,726,607
1966	17,663	34,915	140,350	777,887	3,850,714	8,553,362	14,112,820	5,677,099	28,343,281
1967	(41,567)	137,856	147,183	379,764	5,070,861	9,678,607	10,672,113	6,646,739	26,997,459
1968	84,553	2,130	68,057	253,152	4,412,955	6,392,664	891,681	1,303,186	8,587,531
1969	4,279	11,572	162,300	32,000	1,575,529	3,542,767	792,259	443,924	4,778,950
1970	2,487	6,820	20,086	(15,718)	6,250,411	2,236,607	149,692	115,578	2,501,877
1971	4,350	6,923	17,750	39,084	122,687	98,138	215,512	69,410	383,060
1972	1,084	203	4,800	32,199	95,064	159,608	43,721	7,744	211,073
1973	288	989	7,449	9,693	65,621	105,581	25,496	22,418	153,495
1974	527	6,020	30,628	11,433	134,260	177,700	16,627	45,707	240,034
1975	126	679	1,086	3,464	71,991	239,144	14,680	169,676	423,500
1976	701	3,529	8,362	26,186	167,482	641,860	45,533	65,943	753,336
1977	270	1,310	8,651	24,938	234,239	274,381	20,283	22,568	317,232
1978	231	1,204	1,631	17,123	306,960	801,265	36,221	9,714	847,200
1979	1,367	1,721	2,134	7,322	181,041	1,051,792	59,695	26,106	1,137,593
1980	1,321	1,718	2,182	7,102	445,267	4,173,603	96,760	38,789	4,309,152
1981	308	1,462	1,398	5,077	(114,602)	(502,921)	1,487,516	38,451	1,023,046
1982	716	1,561	1,746	6,074	29,565	700,738	46,501	22,308	769,547
1983	407	5,721	8,143	23,367	651,388	706,104	84,435	211,619	1,002,158
1984	269	1,853	1,667	13,301	662,851	1,559,539	41,352	48,478	1,649,369
1985	402	1,657	2,129	6,750	80,035	677,955	24,812	19,404	722,171
1986	1,119	2,744	3,313	12,234	150,983	398,788	63,830	35,420	498,038
1987	1,496	3,081	3,560	21,842	232,861	799,672	88,945	41,659	930,276
1988	5,706	6,689	7,603	33,728	457,839	2,898,156	(128,051)	(56,448)	2,713,657
1989	2,641	3,878	4,755	14,489	221,320	6,898,872	346,589	173,993	7,419,454
1990	5,092	19,899	36,584	87,796	597,004	13,483,785	112,002	2,446,232	16,042,019
1991	1,942	5,059	7,357	31,682	1,301,551	13,914,632	133,121	114,981	14,162,734
1992	1,184	2,042	2,250	35,464	609,067	6,260,482	241,456	239,437	6,741,375
1993	3,618	6,028	8,873	42,200	548,316	2,542,869	257,330	200,072	3,000,271
1994	2,897	4,781	5,346	89,991	319,255	1,145,666	148,396	88,357	1,382,419
1995	11,556	3,635	14,769	24,750	432,602	1,462,211	217,940	131,995	1,812,146
1996	3,092	2,271	2,699	12,522	209,634	874,227	74,153	41,215	989,595
1997	1,454	4,141	3,655	20,589	318,342	2,064,446	146,851	84,303	2,295,600
1998	363	1,134	(6,005)	5,776	94,709	729,475	33,695	16,670	779,840
1999	1,533	3,304	12,727	31,634	296,751	2,208,776	89,951	90,639	2,388,366
2000	2,406	4,944	5,331	10,755	183,575	(706,517)	57,503	40,185	(608,829)
2001	91,721	68,849	404,226	1,190,653	2,319,521	371,407	91,792	8,926	472,124
2002	229,409	453,259	1,107,580	2,977,939	8,236,039	388,781	44,543	22,639	455,963
2003	67,216	509,964	477,926	1,409,228	7,689,872	178,162	22,779	13,565	214,507
2004	3,193	3,100	39,326	3,276,907	4,931,451	892,410	15,333	77,640	985,383
2005	5,341	5,271	4,848	731,512	2,351,567	294,112	40,135	98,505	432,751
2006	1,298	1,355	1,364	15,425	3,188,790	421,610	15,229	178,089	614,929
2007	7,478	7,479	7,478	10,751	3,190,938	472,317	58,266	122,056	652,639
2008	8,421	8,737	8,938	12,436	5,842,071	1,183,116	39,837	85,661	1,308,614
2009	3,153	3,389	3,470	5,076	12,396,350	545,687	42,671	30,960	619,318
2010	786	792	782	1,186	21,650,862	160,038	9,126	2,869	172,033
2011	1,967	3,317	1,955	4,056	18,623,221	677,231	64,980	12,400	754,611
2012	35,194	96,457	47,814	366,205	10,920,435	1,357,074	204,266	69,909	1,631,248
2013	114,193	75,171	322,552	808,352	5,475,113	7,411,129	498,969	159,362	8,069,459
2014	58,145	58,276	58,157	84,452	2,585,410	3,674,635	230,711	5,026,928	8,932,274
2015	41,284	41,284	41,284	59,298	590,018	5,147,483	121,338	60,669	5,329,490
2016	9,884	9,884	9,884	14,197	144,505	679,582	86,173	43,087	808,842
2017	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,244,196</b>	<b>5,231,895</b>	<b>7,460,448</b>	<b>19,977,460</b>	<b>165,810,756</b>	<b>133,800,317</b>	<b>44,062,122</b>	<b>29,398,670</b>	<b>207,261,108</b>



**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 3 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SAN LUIS DIVISION						SOUTH SAN JOAQUIN DIVISION		
	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7	Subtotal	Reach 8C	Reach 8D	Reach 9
[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	
1952	2,492	3,549	3,987	1,010	1,390	12,428	13	727	1,109
1953	6,999	10,144	10,986	2,834	3,869	34,832	45	2,671	4,185
1954	8,704	12,545	13,693	3,520	4,766	43,228	50	2,719	4,026
1955	4,273	6,055	6,813	1,728	2,325	21,194	19	888	1,100
1956	3,295	5,600	5,857	1,445	3,556	19,753	98	3,850	4,376
1957	3,543	6,115	6,357	1,565	3,998	21,578	234	10,604	13,209
1958	11,927	19,393	22,037	5,509	7,512	66,378	375	19,033	25,073
1959	21,979	37,358	39,689	9,813	19,679	128,518	436	20,578	25,697
1960	207,025	45,419	41,044	12,074	37,633	343,195	1,673	44,565	25,290
1961	184,443	292,639	170,559	38,338	70,068	756,047	3,949	75,726	30,852
1962	495,836	549,984	252,698	22,397	26,967	1,347,882	6,131	159,481	62,375
1963	2,772,189	2,034,351	2,498,712	66,353	30,647	7,402,252	5,861	161,252	81,343
1964	4,348,311	4,932,301	1,053,227	161,422	251,461	10,746,722	4,014	90,622	117,907
1965	3,860,997	5,688,252	2,869,931	1,072,111	667,768	14,159,059	15,049	491,042	564,036
1966	2,312,372	8,527,843	5,765,798	4,230,221	7,708,334	28,544,568	201,274	5,197,322	2,539,278
1967	(44,527)	2,062,305	6,942,522	222,885	6,675,398	15,858,583	212,285	4,982,844	3,363,650
1968	119,884	395,689	973,956	179,917	461,031	2,130,477	64,234	611,192	940,074
1969	(6,065)	126,946	98,492	107,486	160,668	487,527	58,960	116,146	85,130
1970	32,387	(20,243)	105,385	(827,457)	1,215,966	506,038	23,011	106,810	84,116
1971	99,945	230,624	305,227	26,995	341,010	1,003,801	8,813	33,099	23,088
1972	15,990	90,852	17,053	14,621	281,343	419,859	10,818	13,349	16,603
1973	6,753	103,707	41,549	13,810	41,427	207,246	5,145	11,089	13,249
1974	6,618	117,165	55,978	16,199	71,796	267,756	5,434	24,433	16,567
1975	18,921	107,275	23,671	8,797	152,574	311,238	5,424	15,960	12,966
1976	17,485	79,554	13,041	5,138	41,687	156,905	19,931	76,280	62,164
1977	35,707	84,669	9,412	4,028	9,655	143,471	21,096	70,005	97,952
1978	8,539	428,395	7,006	3,536	6,994	454,470	7,594	40,453	17,395
1979	(35,394)	543,225	19,463	9,485	(242,253)	294,526	10,474	6,181	6,227
1980	66,622	3,450,695	191,307	75,209	185,384	3,969,217	2,158	17,492	17,706
1981	28,491	(2,244,127)	(44,017)	(15,456)	918,984	(1,356,125)	1,151	9,642	9,541
1982	100,629	(1,616,569)	20,184	10,359	3,525,738	2,040,341	2,469	8,283	6,956
1983	75,639	33,881	11,785	6,638	1,811,638	1,939,581	7,955	13,782	11,090
1984	31,748	87,083	26,712	12,754	3,053,662	3,211,959	26,489	9,959	6,268
1985	53,251	56,732	13,685	6,934	582,910	713,512	7,220	9,762	7,688
1986	73,979	201,509	50,668	19,223	1,282,469	1,627,848	8,902	25,011	20,503
1987	(7,829)	116,268	40,009	15,946	518,349	682,743	12,744	18,927	56,042
1988	(149,385)	224,154	(406,398)	(137,353)	923,622	454,640	9,833	(119,741)	(60,639)
1989	39,652	594,894	232,852	80,090	575,855	1,523,343	5,279	91,501	278,061
1990	39,270	259,895	79,589	29,606	461,219	869,579	5,814	41,345	2,016,434
1991	4,916,134	397,959	98,847	35,860	511,519	5,960,319	4,588	43,140	41,348
1992	(757,001)	545,729	211,854	74,544	396,398	471,524	3,546	103,695	109,225
1993	110,233	724,929	186,271	70,815	720,283	1,812,531	15,016	101,634	90,929
1994	1,151,976	288,018	63,862	27,812	710,770	2,242,438	6,770	42,455	40,696
1995	285,776	441,479	130,761	58,640	1,914,186	2,830,842	12,548	49,963	43,251
1996	31,942	(110,471)	34,529	12,219	588,712	556,931	6,444	29,863	27,050
1997	73,224	513,793	(277,781)	42,881	5,016,215	5,368,332	11,497	49,111	43,799
1998	19,692	304,115	34,319	16,542	2,619,556	3,194,224	2,562	11,115	8,955
1999	18,187	158,902	100,061	41,691	1,901,382	2,220,222	5,706	25,179	23,510
2000	101,618	373,699	78,036	36,186	1,139,073	1,728,613	3,922	23,591	29,281
2001	(10,513)	(47,112)	519,031	(3,546)	61,595	519,455	2,280	17,030	21,196
2002	12,237	24,434	6,079,343	3,454	(2,453,483)	3,665,985	3,627	44,010	20,221
2003	8,864	79,647	(5,377,004)	7,923	2,183,795	(3,096,775)	2,130	18,793	16,716
2004	(16,126)	(14,365)	(50,563)	(2,487)	(459,225)	(542,766)	22,520	5,980	3,879
2005	261	11,360	129,470	3,529	995,531	1,140,151	26,301	11,593	6,323
2006	1,421	27,658	(10,639)	1,444	(366,505)	(346,620)	6,106	2,942	1,621
2007	2	87,855	39,476	7,718	(120,678)	14,373	13,352	21,920	11,909
2008	14,780	16,097	46,719	13,920	1,110,583	1,202,099	9,017	13,020	7,277
2009	934	216,920	45,727	5,164	(42,304)	226,441	2,380	16,160	8,894
2010	(16)	1,560,454	130,995	655	(347,589)	1,344,499	(1)	1,824	989
2011	57	641,814	479,522	574	76,704	1,198,671	3	1,861	1,017
2012	19	198,367	(16,225)	23,274	157,725	363,159	73	50,805	27,700
2013	21	171,228	755,897	55,843	122,219	1,105,209	211	123,252	67,246
2014	0	169,708	896,065	51,446	102,898	1,220,117	4,074	146,974	85,342
2015	0	987,991	2,164,199	28,432	56,867	3,237,489	0	52,334	28,432
2016	0	998,959	2,571,146	20,192	40,386	3,630,683	0	37,167	20,192
2017	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>20,836,418</b>	<b>36,455,293</b>	<b>30,654,438</b>	<b>6,154,456</b>	<b>48,733,712</b>	<b>142,834,316</b>	<b>947,116</b>	<b>13,560,296</b>	<b>11,395,685</b>

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 4 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SOUTH SAN JOAQUIN DIVISION (continued)								
	Reach 10A	Reach 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]
1952	695	1,279	1,980	995	1,663	794	212	212	1,911
1953	2,569	4,790	7,480	3,745	6,236	2,599	733	741	7,016
1954	2,821	4,855	7,565	3,792	6,319	2,880	810	817	7,073
1955	1,097	1,557	2,404	1,211	2,025	1,183	325	327	2,253
1956	4,428	6,223	9,233	4,737	8,054	7,026	1,638	1,584	9,939
1957	13,269	18,772	29,082	14,615	24,411	15,651	3,834	3,864	26,871
1958	25,086	48,191	78,564	39,087	61,715	33,726	6,175	11,813	49,499
1959	25,787	67,246	107,781	53,836	86,478	64,824	22,102	21,828	70,838
1960	47,492	66,317	77,936	39,867	63,517	84,363	23,260	22,305	73,305
1961	68,505	46,073	88,274	51,457	28,015	242,753	91,290	65,565	150,205
1962	57,705	56,056	69,189	44,851	49,179	208,180	61,489	47,608	133,653
1963	52,585	91,914	173,985	86,405	67,733	425,626	104,436	77,970	102,072
1964	124,014	333,621	291,013	174,469	86,271	1,093,795	684,005	485,033	571,173
1965	622,257	1,053,029	1,524,848	1,044,851	196,487	3,385,205	1,655,024	1,436,258	476,830
1966	2,800,056	3,709,779	673,429	466,228	418,141	4,916,319	974,862	724,354	1,829,852
1967	3,652,342	4,636,627	1,881,333	1,244,265	1,238,428	2,788,299	525,653	400,183	1,721,304
1968	1,025,969	1,323,302	4,726,074	3,145,775	8,343,706	10,210,266	1,330,361	1,405,117	7,522,015
1969	145,111	229,185	706,272	529,080	3,704,065	15,112,041	1,223,457	1,134,395	9,523,012
1970	74,366	85,151	70,725	72,798	320,797	11,031,255	987,213	738,955	8,836,897
1971	15,595	45,006	43,988	42,624	339,078	2,925,191	193,255	36,514	3,275,227
1972	19,736	32,657	43,939	24,748	81,937	1,388,348	101,784	20,165	1,003,380
1973	14,283	16,448	9,980	16,320	25,090	680,834	19,584	13,469	798,805
1974	22,111	14,951	19,555	32,240	29,582	524,504	30,735	16,333	778,696
1975	15,865	13,479	10,793	13,678	25,827	269,197	25,164	21,048	370,265
1976	76,202	54,217	37,464	59,842	105,332	507,519	59,753	42,776	434,574
1977	75,628	52,919	22,826	54,444	81,293	301,515	49,972	30,152	235,514
1978	48,754	16,469	(2,816)	27,331	43,126	348,674	(653)	1,500	297,617
1979	241	6,906	13,401	14,229	25,411	293,786	9,846	7,856	245,590
1980	18,165	18,813	15,608	27,498	34,190	1,676,267	29,169	23,023	1,719,775
1981	10,309	14,885	26,473	20,972	25,515	(1,076,221)	27,551	33,674	(1,142,721)
1982	8,237	6,608	7,680	8,346	16,339	(745,914)	9,886	29,393	(804,147)
1983	14,488	9,792	14,174	13,050	35,872	419,650	17,389	24,933	115,983
1984	7,533	27,613	87,907	49,271	22,732	54,590	75,453	63,060	63,537
1985	9,215	6,949	5,263	8,013	8,875	(49,408)	9,523	5,867	54,782
1986	22,335	16,664	16,014	25,031	20,483	140,642	25,960	13,913	154,089
1987	16,704	13,512	12,369	20,023	15,435	101,453	20,411	8,581	227,047
1988	(159,357)	(73,648)	(151,040)	(51,401)	(120,104)	161,077	(75,276)	(75,307)	144,369
1989	70,153	65,216	63,382	120,925	73,037	2,778,880	119,559	36,660	2,952,046
1990	34,841	29,230	27,269	49,082	34,048	715,031	44,187	14,537	440,017
1991	36,888	32,195	30,146	55,119	34,144	423,235	50,345	12,116	353,596
1992	103,321	99,765	98,178	192,455	97,638	991,603	185,311	9,210	387,615
1993	90,291	70,131	63,247	118,440	80,530	687,462	109,792	38,960	942,211
1994	65,737	29,221	26,997	50,234	35,154	400,534	44,481	17,426	324,942
1995	435,909	32,487	25,516	49,885	41,733	524,524	48,740	29,125	450,952
1996	253,433	19,489	15,020	30,202	29,333	403,125	26,945	16,405	253,622
1997	73,458	30,890	25,368	48,767	40,900	451,910	47,815	29,878	809,848
1998	14,618	7,107	5,773	10,697	9,676	288,667	10,799	6,819	119,562
1999	47,359	17,022	13,362	34,410	31,539	260,623	24,634	14,826	264,538
2000	43,459	21,186	32,480	40,180	25,119	168,825	15,243	11,006	151,512
2001	42,731	14,471	22,325	34,995	8,027	71,645	4,537	3,988	66,918
2002	87,805	19,626	7,157	78,600	47,505	276,160	22,632	34,980	164,596
2003	22,946	9,280	8,935	18,115	15,308	136,433	6,671	9,686	110,492
2004	5,493	3,291	4,188	7,001	5,787	52,563	5,588	1,490	50,520
2005	7,316	6,332	12,579	6,307	6,354	21,617	12,567	44	9,079
2006	1,872	1,680	3,146	1,618	1,736	5,936	3,109	108	2,695
2007	13,807	11,909	23,818	11,909	11,910	40,392	23,818	1	16,745
2008	8,919	6,999	12,960	8,044	8,187	35,363	13,537	568	22,711
2009	10,504	8,926	16,976	9,236	9,565	35,656	17,158	450	18,753
2010	1,148	985	1,985	990	981	3,325	1,988	(7)	1,362
2011	1,177	1,031	2,010	1,016	1,044	3,554	2,002	26	1,530
2012	32,469	27,514	54,437	28,290	28,359	111,560	54,891	316	57,917
2013	79,000	66,691	131,685	68,972	69,157	376,174	133,019	908	246,630
2014	119,000	74,494	116,344	118,817	122,190	949,539	142,265	17,412	857,204
2015	<b>32,965</b>	<b>28,432</b>	<b>56,867</b>	<b>28,432</b>	<b>28,432</b>	<b>348,859</b>	<b>56,867</b>	<b>0</b>	<b>292,405</b>
2016	23,411	20,192	40,386	20,192	20,192	70,918	40,386	0	30,825
2017	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0
TOTAL	10,742,228	12,833,999	11,703,282	8,671,252	16,446,840	68,182,603	9,601,425	7,202,818	48,489,142

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 5 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN (contd.)		TEHACHAPI DIVISION			MOJAVE DIVISION				
	Reach 16A	Subtotal	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 19C	Reach 20A	
[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]		
1952	4,440	16,030	9,703	4,072	13,775	4,090	1,520	0	2,561	
1953	16,513	59,323	31,337	13,284	44,621	12,610	4,685	0	7,246	
1954	16,601	60,328	46,243	20,010	66,253	16,642	6,184	0	9,506	
1955	5,223	19,612	25,880	11,362	37,242	5,612	2,086	0	2,529	
1956	21,754	82,940	47,487	17,609	65,096	6,038	2,244	0	2,440	
1957	62,657	237,073	119,673	49,130	168,803	22,348	8,304	0	9,035	
1958	133,083	537,575	164,056	72,081	236,147	37,917	14,166	123	15,391	
1959	205,748	773,179	151,389	57,883	209,272	38,620	23,450	1,102	23,605	
1960	204,788	774,678	203,222	45,323	248,545	21,356	26,093	5,318	40,523	
1961	206,305	1,148,969	387,819	85,558	473,377	35,664	32,281	2,262	34,918	
1962	171,396	1,127,293	353,119	82,610	435,729	68,508	266,284	1,841	10,323	
1963	481,941	1,913,123	1,191,633	124,757	1,316,390	37,379	435,881	4,137	39,706	
1964	1,778,952	5,834,889	1,866,000	775,005	2,641,005	95,693	706,369	8,564	43,342	
1965	1,268,176	13,733,092	2,574,824	2,284,869	4,859,693	121,060	716,092	9,156	108,519	
1966	2,896,274	27,347,168	5,537,412	9,323,517	14,860,929	366,116	1,644,699	13,373	159,282	
1967	3,442,021	30,089,234	26,239,390	12,398,708	38,638,098	1,312,022	903,880	24,103	645,078	
1968	7,578,498	48,226,583	33,363,479	7,416,464	40,779,943	136,804	7,109,653	71,388	1,889,601	
1969	13,136,056	45,702,910	40,368,425	6,883,206	47,251,631	213,805	2,465,641	7,423	5,939,151	
1970	13,890,751	36,322,845	35,446,706	6,786,231	42,232,937	2,211,077	1,210,665	6,217	3,652,478	
1971	7,903,937	14,885,415	20,141,395	6,835,303	26,976,698	1,496,843	284,738	6,994	1,074,759	
1972	3,025,555	5,783,019	10,002,935	34,791	10,037,726	129,417	409,903	3,620	471,963	
1973	1,472,313	3,096,609	3,090,140	36,207	3,126,347	23,931	75,638	2,539	88,416	
1974	1,031,843	2,546,984	4,798,348	152,494	4,950,842	28,399	205,581	2,703	138,673	
1975	489,545	1,289,211	2,144,178	2,144,178	2,555,582	44,774	70,652	5,066	68,157	
1976	618,049	2,154,103	1,124,357	174,629	1,298,986	121,043	84,593	6,786	59,967	
1977	580,209	1,673,525	655,047	31,512	686,559	261,400	133,767	7,521	117,876	
1978	582,775	1,428,409	1,900,843	27,956	1,928,799	553,014	57,150	5,872	51,615	
1979	542,554	1,182,702	2,099,385	61,381	2,160,766	626,615	339,536	10,831	37,085	
1980	3,772,498	7,372,362	17,433,610	6,046	17,439,656	1,130,429	1,073,430	3,604	308,188	
1981	(2,527,211)	(4,566,440)	(3,848,206)	6,908	(3,841,298)	1,218,824	845,702	4,498	48,625	
1982	(1,850,736)	(3,296,600)	11,370,112	6,054	11,376,166	6,968,683	746,900	3,920	33,869	
1983	166,232	864,390	8,862,914	8,269	8,871,183	10,909,386	64,660	2,596	40,793	
1984	119,387	613,799	3,227,937	31,707	3,259,638	8,340,371	309,491	3,124	17,505	
1985	82,117	165,866	1,926,289	10,460	1,936,749	5,264,156	227,986	3,885	68,422	
1986	186,348	675,895	1,381,955	33,788	1,415,743	2,049,111	2,069,663	4,261	2,331,707	
1987	194,936	718,184	671,183	13,807	684,990	1,347,722	(6,453)	4,684	562,540	
1988	262,334	(308,900)	1,408,760	(49,734)	1,359,026	847,954	(104,961)	13,409	(159,892)	
1989	5,955,356	12,610,055	504,715	64,660	569,375	376,980	207,150	50,953	31,173	
1990	640,283	4,092,118	783,219	25,218	808,437	202,065	(402,573)	61,192	(637,062)	
1991	774,129	1,890,989	691,578	33,405	724,983	273,021	22,218	81,545	(188,732)	
1992	731,512	3,113,074	741,986	24,369	766,355	620,962	384,568	86,644	225,398	
1993	857,038	3,265,681	1,223,402	35,370	1,258,772	1,131,166	248,287	72,746	110,869	
1994	853,328	1,937,975	806,213	16,681	822,894	998,126	164,096	60,147	51,340	
1995	628,941	2,373,574	1,538,497	19,443	1,557,940	390,433	157,481	45,990	92,925	
1996	388,064	1,498,995	2,571,039	10,797	2,581,836	91,593	69,281	22,188	35,656	
1997	481,458	2,144,699	1,009,249	18,265	1,027,514	135,402	92,607	13,590	65,433	
1998	440,746	937,096	925,574	6,843	932,417	47,466	36,170	4,164	29,900	
1999	361,516	1,124,225	662,144	12,166	674,310	113,232	49,150	5,329	171,935	
2000	372,997	938,802	408,352	14,333	422,685	120,267	90,145	936	83,478	
2001	167,694	477,837	266,815	10,891	277,706	65,580	186,973	2,223	343,775	
2002	286,748	1,093,668	247,986	9,586	257,572	35,787	(139,334)	1,374	(11,675)	
2003	159,978	535,484	189,022	12,339	201,361	84,434	(19,049)	0	(11,367)	
2004	322,068	490,368	372,622	4,637	377,259	19,723	17,430	0	18,763	
2005	43,887	170,299	2,264,602	6,587	2,271,188	27,020	18,910	0	25,134	
2006	11,294	43,863	5,855,349	2,353	5,857,702	7,062	4,978	0	6,373	
2007	82,675	284,166	3,829,554	11,915	3,841,469	49,382	35,729	0	47,637	
2008	63,596	210,197	640,715	7,591	648,306	20,474	19,644	0	28,901	
2009	67,633	222,291	9,987,899	10,348	9,998,247	23,685	25,891	0	33,870	
2010	6,865	22,435	11,126,864	940	11,127,803	25,049	2,960	0	3,965	
2011	7,068	23,340	4,979,760	1,192	4,980,952	2,657	3,077	0	4,040	
2012	212,213	686,542	870,739	28,394	899,133	81,257	81,320	0	108,407	
2013	510,460	1,873,406	647,145	69,244	716,389	184,141	196,506	0	261,990	
2014	1,319,909	4,073,564	922,367	76,354	998,721	310,454	154,344	0	205,796	
2015	<b>499,616</b>	<b>1,453,641</b>	<b>38,459</b>	<b>28,432</b>	<b>66,891</b>	<b>475,182</b>	<b>85,298</b>	<b>0</b>	<b>113,733</b>	
2016	142,617	466,478	326,113	20,192	346,305	54,529	60,578	0	80,773	
2017	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	78,563,551	298,340,237	290,980,957	54,867,211	345,818,168	52,092,582	24,321,988	759,941	19,227,931	

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 6 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	MOJAVE DIVISION (continued)							SANTA ANA DIVISION		
	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	
[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]		
1952	892	5,788	35	2,013	2,074	2,413	21,386	3,334	5,599	
1953	3,402	17,846	71	5,752	6,886	7,438	65,936	10,275	17,264	
1954	4,548	23,558	369	8,560	7,849	9,820	87,036	13,566	22,790	
1955	2,213	7,947	178	2,754	2,725	3,313	29,357	4,575	7,687	
1956	2,655	8,542	216	2,905	2,961	3,561	31,562	4,917	8,264	
1957	9,826	31,616	800	10,757	10,962	13,177	116,825	18,205	30,586	
1958	16,752	53,589	1,397	18,717	18,578	22,627	199,237	31,001	52,019	
1959	18,604	56,724	1,844	25,421	20,372	45,646	255,388	39,325	58,137	
1960	37,179	43,893	11,029	136,751	17,152	109,816	449,110	65,655	93,700	
1961	37,102	21,532	14,517	215,859	9,546	373,473	777,154	26,979	56,734	
1962	10,730	8,197	4,186	164,168	4,336	279,421	817,994	9,964	36,235	
1963	40,865	26,670	17,081	237,695	7,228	358,503	1,205,145	31,013	112,271	
1964	71,116	33,912	22,793	262,996	6,863	244,003	1,495,651	69,669	202,642	
1965	343,506	91,095	65,689	827,655	11,836	621,566	2,916,174	279,237	206,356	
1966	1,311,628	160,388	178,538	1,746,245	31,078	1,018,628	6,629,975	415,066	364,004	
1967	1,718,942	498,257	367,961	3,146,128	62,135	2,331,106	11,009,612	3,184,296	638,539	
1968	2,291,691	1,141,929	1,145,768	4,588,850	102,207	2,600,293	12,078,184	8,264,126	1,268,194	
1969	5,626,284	2,358,737	1,515,147	7,750,478	260,659	11,131,406	37,268,731	6,807,783	1,768,456	
1970	5,304,372	3,232,911	2,081,810	23,451,612	1,240,798	16,885,193	59,277,133	2,169,051	7,229,429	
1971	1,091,123	825,070	432,464	16,772,680	1,922,115	5,385,721	29,292,507	1,135,248	9,811,736	
1972	635,507	484,772	324,865	3,788,894	48,049	788,479	7,085,469	1,095,740	5,528,987	
1973	83,840	63,774	36,179	1,623,274	24,333	4,225,877	6,247,801	136,994	1,810,729	
1974	118,639	103,545	54,198	5,699,605	130,567	766,562	7,248,472	68,180	1,922,999	
1975	169,294	167,240	19,453	4,793,580	19,467	373,783	5,731,466	166,653	3,787,797	
1976	102,909	44,896	24,732	3,103,916	84,188	204,705	3,837,735	475,176	1,494,750	
1977	120,160	71,389	49,445	1,654,122	60,112	232,230	2,708,024	76,255	776,085	
1978	68,838	32,855	18,183	677,448	36,484	210,198	1,711,657	57,463	131,076	
1979	36,225	18,948	10,675	560,506	10,634	103,615	1,754,670	29,960	80,482	
1980	284,545	133,526	121,171	2,239,224	60,229	559,963	5,914,309	31,462	181,638	
1981	32,214	13,223	6,466	(774,614)	138,917	203,941	1,737,796	5,864	69,031	
1982	77,988	13,158	14,459	432,274	346,905	79,819	8,717,975	9,224	159,280	
1983	58,714	25,900	10,363	451,428	2,029,405	58,989	13,652,234	4,304	528,764	
1984	35,378	845,423	6,052	(83,811)	1,290,740	34,764	10,799,037	3,850	270,455	
1985	(232,549)	(481,017)	1,945,477	608,583	966,160	51,634	8,422,737	5,555	62,571	
1986	(2,046,222)	(1,334,975)	3,260,280	1,097,122	230,510	51,994	7,713,451	9,927	114,561	
1987	(344,829)	55,519	64,264	3,631,282	146,850	91,223	5,552,802	4,908	27,208	
1988	(147,290)	(70,564)	351,489	552,546	558,557	197,761	2,039,009	7,358	161,957	
1989	60,657	30,217	534,658	4,161,037	1,496,776	433,072	7,382,673	8,092	(2,297,399)	
1990	(403,413)	(635,623)	(97,841)	8,794,258	1,394,698	344,367	8,620,068	176,854	(1,657,576)	
1991	(18,809)	(147,369)	(17,234)	7,985,326	3,624,824	139,105	11,753,895	202,286	(1,316,160)	
1992	338,098	(263,897)	75,210	4,849,560	8,364,426	127,829	14,808,798	333,934	(1,878,502)	
1993	180,598	133,941	49,144	2,094,764	15,390,366	159,211	19,571,092	1,506,787	3,979,221	
1994	114,273	65,260	26,546	933,021	8,082,401	81,869	10,577,079	2,104,588	2,493,097	
1995	121,499	66,503	30,918	1,096,953	5,924,175	123,653	8,050,530	3,310,564	500,791	
1996	48,699	44,953	17,787	1,736,686	2,181,669	96,339	4,344,851	19,019,751	(100,474)	
1997	39,973	55,881	27,865	809,666	(342,563)	102,390	1,000,244	7,645,602	(662,524)	
1998	27,626	20,285	12,816	273,139	3,392,776	36,135	3,880,497	993,619	1,613,505	
1999	58,392	37,680	17,874	1,006,721	2,208,657	123,472	3,792,421	224,119	843,638	
2000	75,230	44,857	20,181	724,837	1,251,684	83,871	2,495,486	129,156	1,285,637	
2001	121,907	77,799	54,526	550,843	342,964	26,780	1,773,369	73,031	447,282	
2002	(82,663)	(7,369)	(43,431)	270,386	269,139	71,793	264,008	54,815	1,753,554	
2003	(7,564)	(3,238)	(3,009)	382,025	146,659	30,255	599,147	86,731	350,997	
2004	12,619	13,744	5,414	262,810	48,570	12,285	411,358	13,577	275,709	
2005	18,874	25,074	6,335	62,967	104,838	144,149	433,303	16,962	120,279	
2006	4,511	5,983	1,500	15,163	294,318	577,859	917,747	21,932	16,665	
2007	35,725	47,634	11,908	151,063	919,040	69,935	1,368,052	12,905	55,918	
2008	19,526	25,456	6,313	346,638	3,113,899	2,019,852	5,600,705	2,481	82,555	
2009	24,745	32,909	8,241	940,452	448,164	1,834,401	3,372,357	2,972	260,999	
2010	2,992	3,992	997	2,207,142	26,737	1,373,264	3,647,098	(3)	119,968	
2011	2,966	3,947	988	5,917,166	4,612	99,900	6,039,352	11	31,884	
2012	81,282	108,375	27,093	10,065,497	81,296	20,072	10,654,598	4	405,081	
2013	196,465	261,955	65,486	5,993,949	284,922	40,195	7,485,608	4	836,549	
2014	154,344	205,796	51,446	2,991,990	1,014,662	0	5,088,832	0	1,589,619	
2015	85,298	113,733	28,432	286,117	246,174	0	1,433,967	0	3,187,695	
2016	60,578	80,773	20,192	203,198	645,107	0	1,205,728	0	336,298	
2017	0	0	0	0	0	0	0	0	0	
2018	0	0	0	0	0	0	0	0	0	
2019	0	0	0	0	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
TOTAL	18,371,219	9,285,021	13,119,999	154,546,751	70,891,457	57,854,715	420,471,604	60,712,933	51,773,319	

**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 7 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)				WEST BRANCH					
	Reach 28G (a)	Reach 28H	Reach 28J	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	
[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[64]		
1952	4,785	4,055	3,020	20,793	2,924	136	175	459	553	
1953	15,580	11,511	9,476	64,106	9,093	344	237	1,754	1,683	
1954	18,015	18,100	12,160	84,631	7,389	1,201	2,229	2,350	4,162	
1955	6,052	6,081	4,151	28,546	1,019	585	1,086	1,147	2,029	
1956	6,496	6,525	4,480	30,682	490	698	1,297	1,366	2,420	
1957	24,044	24,156	16,595	113,576	1,809	2,583	4,792	5,057	8,952	
1958	40,844	41,033	28,470	193,367	3,256	4,516	8,714	8,878	15,847	
1959	45,746	45,946	44,331	233,485	7,953	9,150	19,414	18,243	35,583	
1960	59,102	58,548	118,969	395,974	21,753	14,990	34,447	29,764	69,752	
1961	32,226	34,382	674,787	825,108	22,442	12,775	21,559	20,086	39,761	
1962	21,383	20,530	47,484	135,596	40,237	28,729	86,938	58,215	108,962	
1963	43,884	41,698	1,506,440	1,735,306	91,959	69,162	163,347	110,015	211,592	
1964	89,710	45,762	98,569	506,352	150,670	66,420	207,977	143,340	291,404	
1965	96,956	76,899	146,095	805,543	361,811	77,914	403,115	127,430	589,638	
1966	170,878	308,756	589,107	1,847,811	489,512	203,497	1,233,640	348,918	3,231,797	
1967	233,968	283,126	987,832	5,327,761	1,589,715	882,096	1,117,243	891,607	31,088,491	
1968	871,337	266,295	780,587	11,450,539	3,899,363	300,921	396,190	1,104,832	36,157,768	
1969	1,117,873	1,444,654	756,442	11,895,208	6,592,580	336,480	693,348	1,184,454	9,655,871	
1970	1,843,621	1,013,468	2,829,523	15,085,092	7,986,733	6,089,401	2,624,747	3,002,968	8,463,475	
1971	16,095,702	6,401,303	12,111,623	45,555,612	4,247,037	3,768,699	1,120,231	8,244,651	5,844,024	
1972	1,537,880	11,960,791	21,542,747	41,666,145	1,871,831	426,932	985,512	18,787,722	(23,015,734)	
1973	209,664	247,769	3,673,344	6,078,500	775,824	168,064	399,856	9,408,706	1,821,206	
1974	162,178	101,638	1,980,991	4,235,986	560,657	168,878	169,717	3,901,261	(3,454,239)	
1975	157,365	124,399	1,626,274	5,862,488	353,670	421,176	925,693	664,113	609,891	
1976	178,287	118,748	1,497,465	3,764,426	396,809	650,417	1,274,484	706,244	650,209	
1977	127,106	89,036	323,091	1,391,573	390,637	3,018,637	2,152,961	196,012	1,135,148	
1978	147,112	153,867	347,462	837,000	1,427,190	2,219,135	6,694,615	57,817	149,932	
1979	29,723	19,225	225,947	385,337	940,013	2,168,382	19,813,742	597,858	331,313	
1980	137,833	154,821	1,077,900	1,583,654	1,276,793	4,108,143	24,537,814	550,337	204,751	
1981	28,815	22,654	61,349	187,713	(711,751)	2,699,873	19,806,531	94,944	28,852	
1982	16,069	58,900	55,841	299,314	(465,217)	351,251	17,964,617	215,678	42,587	
1983	18,213	89,581	(264,804)	376,058	100,394	180,971	6,751,649	220,029	24,295	
1984	14,462	12,259	49,547	350,573	71,759	68,930	2,870,259	335,942	17,285	
1985	17,816	11,481	54,070	151,493	142,244	25,386	2,126,670	102,366	21,971	
1986	31,564	25,037	86,794	267,883	133,914	62,294	274,660	141,894	36,149	
1987	17,141	8,005	45,528	102,790	13,966	453,949	711,773	192,511	27,931	
1988	41,892	21,113	90,784	323,104	427,544	118,010	1,660,959	203,130	95,930	
1989	28,708	12,619	51,556	(2,196,424)	207,067	430,662	584,186	241,811	97,472	
1990	27,478	12,817	55,408	(1,385,019)	197,428	355,480	386,882	813,211	54,269	
1991	142,139	15,524	62,794	(893,417)	219,321	344,386	453,336	1,132,520	55,176	
1992	34,185	13,422	69,479	(1,427,482)	541,026	295,312	464,421	4,402,524	47,182	
1993	44,300	27,047	162,854	5,720,209	464,987	320,182	643,189	3,361,457	74,198	
1994	16,351	11,673	54,581	4,680,290	203,666	231,527	362,717	306,148	33,758	
1995	35,402	28,202	164,254	4,039,213	344,358	392,647	536,253	468,656	34,007	
1996	76,723	73,629	344,747	19,414,376	150,901	161,394	427,223	203,201	15,357	
1997	50,662	20,720	268,293	7,322,753	298,002	71,310	432,940	276,180	50,995	
1998	10,268	8,970	479,138	3,105,500	346,973	21,003	2,028,979	181,951	49,377	
1999	84,683	45,293	324,223	1,521,955	296,520	37,641	1,080,682	125,373	51,213	
2000	64,095	41,331	114,224	1,634,443	212,174	33,747	238,676	116,588	13,241	
2001	20,193	13,635	88,656	642,797	43,281	6,448	104,127	110,850	10,737	
2002	53,787	12,619	196,949	2,071,724	171,190	30,767	252,912	60,146	7,881	
2003	1,096,665	2,482,179	179,466	4,196,038	50,519	9,141	103,160	57,712	51,000	
2004	1,736,308	856,587	24,559	2,906,739	47,768	6,780	27,718	107,695	215,925	
2005	2,049,655	410,021	270,894	2,867,810	273,482	12,718	54,409	6,642	52,413	
2006	2,302,259	406,071	2,571,775	5,318,702	660,664	3,079	115,825	1,557	2,299,565	
2007	(246)	1,099,958	3,664,358	4,832,893	107,460	25,257	1,958,512	269,569	347	
2008	835,530	899,508	682,829	2,502,902	2,090,139	14,503	103,704	1,001,788	2,089	
2009	4,202,648	976,867	2,819,145	8,262,631	1,931,429	17,722	22,988	1,463,563	631	
2010	43,408	930,165	3,865,738	4,959,276	864,340	2,114	24,691	231,970	(12)	
2011	1,173,995	577	1,955,691	3,162,158	425,260	2,100	2,215	39,980	41	
2012	2,742,045	197,276	2,742,639	6,087,046	612,609	57,465	77,631	26,933	10,200	
2013	3,276,049	1,266,108	7,087,461	12,466,170	166,890	153,136	181,200	63,228	15,170	
2014	0	0	16,894,535	18,484,154	266,016	352,894	662,078	49,638	3,434	
2015	0	0	<b>37,703,484</b>	<b>40,891,179</b>	<b>38,462</b>	<b>1,580,747</b>	<b>586,806</b>	<b>27,433</b>	<b>3,434</b>	
2016	0	0	23,510,179	23,846,477	27,315	813,282	423,995	19,483	2,438	
2017	0	0	16,315,023	16,315,023	0	0	0	0	0	
2018	0	0	31,927,997	31,927,997	0	0	0	0	0	
2019	0	0	15,410,551	15,410,551	0	0	0	0	0	
2020	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	
<b>TOTAL</b>	<b>43,858,611</b>	<b>33,234,967</b>	<b>223,307,958</b>	<b>412,887,789</b>	<b>44,493,239</b>	<b>34,964,169</b>	<b>129,603,691</b>	<b>66,849,907</b>	<b>77,801,880</b>	

(a) Includes excess capacity costs (not shown in Table B-9) allocated to MWDSC in the following years and repaid under Article 24(c) of its contract: 1970 - \$362,000; 1971 - \$6,198,000; 1972 - \$139,000.



**TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge**

(in dollars)

Sheet 8 of 8

Calendar Year	CALIFORNIA AQUEDUCT (continued)											Total	GRAND TOTAL
	WEST BRANCH (cont.)		COASTAL BRANCH								Subtotal		
	Reach 30	Subtotal	Reach 31A	Reach 33A	Reach 33B	Reach 34	Reach 35	Reach 37	Reach 38				
[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]	[75]	[76]		
1952	1,408	5,655	0	0	0	0	0	0	0	0	98,857	99,353	
1953	4,346	17,457	0	0	0	0	0	0	0	0	309,387	311,812	
1954	5,743	23,074	0	0	0	0	0	0	0	0	394,688	402,143	
1955	1,943	7,809	0	0	0	0	0	0	0	0	159,842	169,342	
1956	2,077	8,348	0	0	0	0	0	0	0	0	255,679	351,551	
1957	7,684	30,877	0	0	0	0	0	0	0	0	708,753	1,464,452	
1958	13,931	55,142	0	0	0	0	0	0	0	0	1,331,616	2,286,623	
1959	44,384	134,727	28,046	49,114	0	7,441	8,236	0	0	92,837	2,096,392	2,967,412	
1960	84,703	255,409	34,404	70,450	0	8,507	14,265	0	0	127,626	2,937,049	4,660,833	
1961	123,330	239,953	13,801	17,868	0	1,501	3,931	0	0	37,101	4,650,264	8,545,244	
1962	348,366	671,447	10,121	7,798	0	524	1,689	0	0	20,132	5,827,774	8,875,171	
1963	521,491	1,167,566	20,470	14,299	0	880	2,943	0	0	38,592	18,981,487	24,610,278	
1964	1,372,464	2,232,275	315,418	26,963	0	1,687	5,639	0	0	349,707	31,550,813	41,736,060	
1965	3,383,950	4,943,858	747,023	36,178	0	2,118	7,060	0	0	792,379	57,936,405	62,664,743	
1966	9,364,753	14,872,117	2,258,915	35,864	0	1,736	5,764	0	0	2,302,279	124,748,128	129,110,330	
1967	17,618,827	53,187,979	6,310,419	38,331	0	1,891	6,213	0	0	6,356,854	187,465,580	194,146,365	
1968	15,736,691	57,595,765	2,707,580	30,784	0	1,324	4,369	0	0	2,744,057	192,593,079	197,978,911	
1969	16,228,175	34,690,908	423,797	26,549	0	907	2,905	0	0	454,158	182,530,023	184,473,490	
1970	22,330,328	50,497,652	269,194	24,368	0	851	2,787	0	0	297,200	206,720,774	207,082,650	
1971	16,890,503	40,115,145	164,446	32,230	0	1,315	3,804	0	0	201,795	158,414,033	158,624,739	
1972	3,818,001	7,242,264	131,332	17,601	0	522	1,660	0	0	151,115	68,228,670	68,362,291	
1973	13,426,222	25,999,878	182,493	16,154	0	542	1,758	0	0	200,947	45,110,823	45,263,853	
1974	2,988,318	4,334,592	190,866	18,799	0	463	1,405	0	0	211,533	24,036,199	24,402,166	
1975	1,808,235	4,782,778	64,582	36,012	0	2,255	6,656	0	0	109,505	21,065,768	21,318,838	
1976	1,253,067	4,931,230	198,266	68,898	0	5,088	14,988	0	0	287,240	17,183,961	17,492,910	
1977	345,023	7,238,418	918,473	81,305	0	1,834	5,387	0	0	1,006,999	15,165,801	15,544,382	
1978	763,445	11,312,134	52,994	83,300	0	1,302	3,852	0	0	141,448	18,661,117	19,119,151	
1979	282,145	24,133,453	38,182	108,951	0	1,505	4,433	0	0	153,071	31,202,118	31,857,962	
1980	2,055,206	32,733,044	189,070	376,036	0	1,152	3,449	0	0	569,707	73,891,101	74,986,833	
1981	275,460	22,193,909	19,897	(157,537)	0	1,427	4,261	0	0	(131,952)	15,246,649	15,742,773	
1982	351,376	18,460,292	(16,381)	(96,449)	0	588	1,787	0	0	(110,455)	38,256,580	39,705,931	
1983	566,545	7,843,883	85,496	67,106	0	794	2,398	0	0	155,794	34,705,281	38,044,649	
1984	1,118,954	4,483,129	28,568	54,074	0	986	2,959	0	0	86,587	24,454,091	30,482,250	
1985	284,243	2,702,880	36,834	54,314	0	2,111	6,263	0	0	99,522	14,914,930	28,537,556	
1986	213,353	862,264	82,358	223,134	0	17,458	51,279	0	0	374,229	13,435,351	43,155,828	
1987	158,313	1,558,413	53,817	1,061,939	0	92,506	272,968	0	0	1,481,230	11,711,428	34,331,982	
1988	222,068	2,727,641	183,853	1,141,272	0	99,456	293,612	0	0	1,718,193	11,026,370	18,123,243	
1989	148,674	1,709,872	84,678	893,765	0	77,283	228,038	0	0	1,283,764	30,302,112	33,130,497	
1990	119,438	1,926,708	133,868	1,100,167	0	103,785	277,889	0	0	1,615,709	32,589,619	34,435,721	
1991	229,315	2,434,054	164,610	1,635,283	0	123,603	363,889	0	0	2,287,385	38,320,942	39,811,664	
1992	206,495	5,956,960	183,240	1,220,510	1,495,646	566,230	240,553	102,051	74,162	3,882,392	34,312,996	35,041,233	
1993	296,349	5,160,362	344,928	5,274,657	5,052,431	1,345,211	688,935	268,937	358,367	13,333,466	53,122,384	53,921,787	
1994	168,426	1,306,242	282,150	15,905,886	21,341,196	8,915,445	2,363,238	678,753	1,315,559	50,802,227	73,751,564	74,225,377	
1995	304,983	2,080,904	1,196,326	45,172,271	62,947,362	23,975,738	20,849,939	7,029,108	7,117,197	168,287,941	191,033,090	191,525,571	
1996	98,522	1,056,598	948,730	42,987,442	54,300,990	26,475,298	18,790,572	7,213,823	6,616,310	157,333,165	187,776,347	188,025,325	
1997	233,956	1,362,483	562,583	11,209,633	13,893,576	10,456,863	4,149,105	545,378	798,606	41,615,744	62,137,369	62,583,537	
1998	67,874	2,696,157	248,671	2,355,322	4,159,441	3,368,320	952,615	192,567	280,779	11,557,715	27,083,446	27,217,157	
1999	118,013	1,709,442	288,236	2,906,010	4,398,935	2,616,574	356,318	36,680	51,648	10,654,402	24,085,343	24,556,053	
2000	187,926	802,352	132,435	228,901	2,965,936	2,746,120	17,830	0	0	6,091,222	13,504,773	13,742,557	
2001	23,847	299,290	103,281	(7,057)	568,968	3,960	(1,112)	0	0	668,039	5,130,617	7,470,505	
2002	62,684	585,581	98,021	147,827	105,972	77,266	13,119	0	0	442,204	8,836,704	17,138,613	
2003	34,282	305,814	42,075	43,753	31,706	25,734	6,272	0	0	149,540	3,105,115	10,869,934	
2004	16,535	422,421	26,667	13,644	21,479	3,142	1,942	0	0	66,873	5,117,635	10,222,860	
2005	594,136	993,800	29,337	(261,476)	38,618	526	327	0	0	(192,669)	8,116,634	10,591,742	
2006	164,739	3,245,429	7,046	6,303	37,583	4	18,012	0	0	68,949	15,720,701	19,817,715	
2007	31,047	2,392,192	37,460	32,702	42,774	0	152	0	0	113,088	13,498,872	19,970,334	
2008	60,186	3,272,409	41,227	34,997	10,865	24	14,163	0	0	101,277	14,846,508	28,653,622	
2009	47,211	3,483,543	19,458	17,409	2,357	43	44,176	0	0	83,443	26,268,272	39,882,427	
2010	17,025	1,140,128	633,621	3,158	0	(1)	(1,210)	0	0	635,568	23,048,840	45,100,851	
2011	2,023	471,619	848,388	611	0	4	4,284	0	0	853,287	17,483,991	36,278,779	
2012	54,204	839,043	189,791	148,443	0	96	1,455	0	0	339,786	21,500,557	33,067,928	
2013	120,003	699,626	471,399	382,159	0	209	1,590	0	0	855,357	33,271,225	39,600,176	
2014	94,117	1,428,177	4,769,538	1,289,228	0	4,475	0	0	0	6,063,241	46,289,080	50,408,239	
2015	52,014	2,288,896	1,292,514	238,727	0	0	0	0	0	1,531,241	56,232,794	57,378,708	
2016	36,940	1,323,453	273,018	105,223	0	0	0	0	0	378,241	32,006,207	32,391,608	
2017	0	0	35,000	0	0	0	0	0	0	35,000	16,350,023	16,350,023	
2018	0	0	0	0	0	0	0	0	0	0	31,927,997	31,927,997	
2019	0	0	0	0	0	0	0	0	0	0	15,410,551	15,410,551	
2020	0	0	0	0	0	0	0	0	0	0	0	0	
2021	0	0	0	0	0	0	0	0	0	0	0	0	
2022	0	0	0	0	0	0	0	0	0	0	0	0	
2023	0	0	0	0	0	0	0	0	0	0	0	0	
2024	0	0	0	0	0	0	0	0	0	0	0	0	
2025	0	0	0	0	0	0	0	0	0	0	0	0	
2026	0	0	0	0	0	0	0	0	0	0	0	0	
2027	0	0	0	0	0	0	0	0	0	0	0	0	
2028	0	0	0	0	0	0	0	0	0	0	0	0	
2029	0	0	0	0	0	0	0	0	0	0	0	0	
2030	0	0	0	0	0	0	0	0	0	0	0	0	
2031	0	0	0	0	0	0	0	0	0	0	0	0	
2032	0	0	0	0	0	0	0	0	0	0	0	0	
2033	0	0	0	0	0	0	0	0	0	0	0	0	
2034	0	0	0	0	0	0	0	0	0	0	0	0	
2035	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	137,606,034	491,318,920	29,232,631	136,651,204	171,415,834	81,146,622	50,130,810	16,067,297	16,612,628	501,257,026	2,820,189,168	3,097,682,590	

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 1 of 9

Calendar Year	UPPER FEATHER DIVISION	NORTH BAY AQUEDUCT					SOUTH BAY AQUEDUCT			
		Reach 1	Reach 2	Reach 3A	Reach 3B	Total	Reach 1	Reach 2	Reach 4	Reach 5
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	37,396	5,522	0	0
1963	0	0	0	0	0	0	147,719	20,639	0	0
1964	0	0	0	0	0	0	149,750	15,574	19,405	0
1965	0	0	0	0	0	0	259,939	45,718	46,485	0
1966	0	0	0	0	0	0	270,890	23,799	63,921	0
1967	0	0	0	0	0	0	438,050	32,798	108,127	0
1968	0	0	0	0	130	130	410,919	44,277	66,973	706
1969	0	0	0	0	80,875	80,875	487,377	48,339	75,644	706
1970	0	0	0	0	94,872	94,872	381,734	44,852	64,833	71,376
1971	54	0	0	0	45,579	45,579	357,850	25,666	50,344	38,735
1972	40	0	0	0	37,895	37,895	347,941	30,606	56,800	100,106
1973	1	0	0	0	32,993	32,993	386,897	36,172	58,288	28,810
1974	143	0	0	0	46,498	46,498	456,381	57,081	83,120	61,623
1975	1,069	0	0	0	37,707	37,707	624,989	46,111	81,361	36,682
1976	139	0	0	0	60,786	60,786	614,362	47,862	123,838	91,096
1977	892	0	0	0	78,400	78,400	511,065	48,926	104,280	102,083
1978	39	0	0	0	56,318	56,318	671,195	125,224	176,855	50,289
1979	3,235	0	0	0	73,852	73,852	650,826	76,849	212,826	91,380
1980	416	0	0	0	81,769	81,769	1,128,840	212,974	242,118	110,786
1981	3,847	0	0	0	101,340	101,340	884,763	130,126	167,118	204,772
1982	11,075	0	0	0	191,987	191,987	1,156,605	141,718	249,447	96,020
1983	1,928	0	0	0	80,215	80,215	1,258,144	84,360	373,875	152,255
1984	3,765	0	0	0	139,121	139,121	1,998,984	113,797	340,344	34,461
1985	2,888	0	0	0	259,515	259,515	2,044,121	207,478	427,930	247,308
1986	2,787	0	0	0	229,508	229,508	1,834,838	285,908	305,149	159,054
1987	2,388	0	0	0	310,683	310,683	2,118,974	163,714	400,547	283,067
1988	545	0	(94)	0	330,156	330,062	2,068,655	186,275	299,934	370,212
1989	1,800	473,408	178,069	237,480	373,427	1,262,384	2,164,688	163,481	320,734	497,038
1990	788	556,610	244,897	123,144	427,257	1,351,908	2,233,036	251,434	355,022	571,415
1991	3,654	651,307	302,327	205,516	428,470	1,587,620	1,806,699	152,509	95,745	93,986
1992	647	443,912	189,330	265,462	280,505	1,179,209	2,064,907	405,932	409,435	363,964
1993	3,630	435,240	294,416	213,267	289,206	1,232,129	3,925,050	621,712	480,832	399,558
1994	2,279	430,112	198,322	206,594	365,646	1,200,674	4,673,275	302,115	404,709	408,066
1995	2,906	428,313	282,898	151,703	295,326	1,158,240	3,849,620	316,905	566,447	330,706
1996	8,007	796,526	272,743	240,106	260,001	1,569,376	3,526,989	254,075	664,485	493,300
1997	7,449	504,476	210,763	213,211	315,374	1,243,824	3,010,809	189,269	591,540	230,371
1998	798	404,834	227,562	204,821	251,154	1,088,371	2,965,219	426,872	532,042	303,263
1999	416	678,159	332,340	298,066	298,895	1,598,459	3,748,823	478,982	437,660	463,868
2000	505	919,679	254,626	657,967	414,264	2,246,536	3,810,111	541,675	440,808	550,541
2001	314	1,072,590	232,733	455,788	181,399	1,942,510	2,907,982	272,736	289,992	391,005
2002	3,627	1,586,514	416,245	411,031	398,722	2,812,512	3,854,560	341,692	466,403	538,492
2003	3,393	1,777,923	549,313	567,865	354,483	3,249,584	2,352,925	366,425	576,304	965,154
2004	3,455	1,602,959	638,663	738,316	818,552	3,798,489	3,346,328	511,141	747,866	701,021
2005	3,452	1,061,615	324,888	767,626	412,975	2,567,104	3,319,589	263,886	429,373	811,619
2006	3,867	813,421	258,102	598,977	439,925	2,110,425	3,436,889	375,373	746,443	597,416
2007	2,992	1,109,394	259,723	461,131	291,602	2,121,850	5,048,551	690,347	595,474	784,828
2008	3,536	865,570	251,956	622,266	622,266	2,259,856	5,262,367	678,439	752,698	920,367
2009	88	1,250,193	298,837	608,611	564,525	2,722,165	4,002,421	669,660	704,864	1,348,870
2010	25	2,712,829	140,875	1,086,845	294,504	4,235,052	4,534,313	583,979	815,985	716,271
2011	63	2,625,807	608,645	1,213,530	430,214	4,878,196	5,176,103	837,326	875,807	500,280
2012	29	2,409,537	163,305	1,432,122	1,139,235	5,144,199	5,359,174	1,121,136	762,367	836,845
2013	321	3,282,622	145,951	476,257	381,027	4,285,858	6,203,840	1,234,734	675,657	1,119,087
2014	153	3,772,836	341,072	1,027,194	579,763	5,720,865	6,300,651	1,203,235	880,626	1,100,607
2015	175	3,849,378	389,799	1,173,417	661,946	6,074,540	7,189,722	1,370,749	1,009,007	1,160,888
2016	183	3,703,709	407,467	1,226,664	691,870	6,029,710	7,507,397	1,431,778	1,051,594	1,204,465
2017	172	3,813,061	383,240	1,153,849	650,971	6,001,121	7,069,249	1,348,607	990,213	1,166,873
2018	173	3,851,192	387,073	1,165,388	657,481	6,061,134	7,139,941	1,362,093	1,000,115	1,178,542
2019	175	3,889,704	390,944	1,177,042	664,056	6,121,746	7,211,340	1,375,714	1,010,116	1,190,327
2020	177	3,928,601	394,853	1,188,812	670,696	6,182,962	7,283,454	1,389,471	1,020,218	1,202,231
2021	179	3,967,887	398,802	1,200,700	677,403	6,244,792	7,356,288	1,403,365	1,030,420	1,214,253
2022	180	4,007,566	402,790	1,212,707	684,177	6,307,240	7,429,851	1,417,399	1,040,724	1,226,395
2023	182	4,047,641	406,817	1,224,834	691,019	6,370,311	7,504,150	1,431,573	1,051,131	1,238,659
2024	184	4,088,118	410,886	1,237,083	697,929	6,434,016	7,579,191	1,445,889	1,061,642	1,251,046
2025	186	4,128,999	414,995	1,249,453	704,909	6,498,356	7,654,983	1,460,348	1,072,259	1,263,556
2026	188	4,170,289	419,144	1,261,948	711,958	6,563,339	7,731,533	1,474,951	1,082,981	1,276,192
2027	190	4,211,992	423,336	1,274,567	719,077	6,628,972	7,808,848	1,489,701	1,093,811	1,288,954
2028	192	4,254,112	427,569	1,287,313	726,268	6,695,262	7,886,937	1,504,598	1,104,749	1,301,843
2029	193	4,296,653	431,845	1,300,186	733,531	6,762,215	7,965,806	1,519,644	1,115,797	1,314,862
2030	195	4,339,619	436,163	1,313,188	740,866	6,829,836	8,045,464	1,534,840	1,126,955	1,328,011
2031	197	4,383,015	440,525	1,326,320	748,275	6,898,135	8,125,919	1,550,188	1,138,224	1,341,291
2032	199	4,426,846	444,930	1,339,583	755,757	6,967,116	8,207,178	1,565,690	1,149,607	1,354,704
2033	201	4,471,114	449,380	1,352,979	763,315	7,036,788	8,289,250	1,581,347	1,161,103	1,368,251
2034	203	4,515,825	453,873	1,366,509	770,948	7,107,155	8,372,142	1,597,161	1,172,714	1,381,933
2035	205	4,560,983	458,412	1,380,174	778,658	7,178,227	8,455,864	1,613,132	1,184,441	1,395,752
TOTAL	97,374	119,572,690	16,391,351	39,795,409	28,171,026	203,930,476	282,398,631	46,425,672	41,486,700	45,018,494

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 2 of 9

Calendar Year	SOUTH BAY AQUEDUCT (continued)					CALIFORNIA AQUEDUCT			
						NORTH SAN JOAQUIN DIVISION			
	Reach 6	Reach 7	Reach 8	Reach 9	Total	Reach 1	Reach 2A	Reach 2B	Subtotal
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	42,918	0	0	0	0
1963	0	0	0	0	168,358	0	0	0	0
1964	0	0	0	0	184,729	0	0	0	0
1965	2,634	6,490	4,704	12,904	378,874	0	0	0	0
1966	4,707	10,328	9,233	25,519	408,397	0	0	0	0
1967	2,712	7,659	10,812	34,347	634,505	0	0	0	0
1968	3,109	7,960	10,166	40,372	584,482	1,001,998	228,359	103,116	1,333,473
1969	3,944	5,975	8,795	38,566	669,346	933,116	301,596	188,194	1,422,906
1970	2,464	(1,991)	6,870	28,210	598,348	971,602	306,198	151,539	1,429,339
1971	3,116	9,394	9,895	31,068	526,068	1,103,021	254,786	113,694	1,471,501
1972	5,125	10,247	12,054	44,699	607,578	1,107,855	230,906	110,109	1,448,870
1973	4,178	7,500	4,890	43,816	570,551	1,150,864	221,445	100,221	1,472,530
1974	7,812	7,564	5,523	48,054	727,158	1,272,034	231,383	117,156	1,620,573
1975	18,120	14,683	18,325	68,377	908,648	1,434,736	455,110	201,075	2,090,921
1976	10,873	5,557	19,920	49,921	963,429	1,519,801	217,348	453,400	2,190,549
1977	(240)	2,228	8,391	89,579	866,312	1,913,643	292,380	196,564	2,402,567
1978	(1,404)	16,766	(5,313)	104,078	1,137,690	1,860,456	306,503	188,214	2,355,173
1979	1,269	29,294	7,351	106,835	1,176,330	1,848,109	231,339	145,205	2,224,653
1980	3,621	24,270	17,404	110,852	1,850,865	2,365,292	472,660	247,608	3,085,560
1981	4,038	20,109	17,586	98,143	1,526,655	2,649,730	435,226	154,191	3,239,147
1982	2,236	22,870	21,919	202,590	1,893,405	3,192,710	599,793	244,664	4,037,167
1983	(2,047)	48,781	45,573	216,434	2,177,375	4,244,937	802,908	273,081	5,320,926
1984	4,449	44,017	23,563	455,054	3,014,669	4,373,157	808,917	290,728	5,472,802
1985	13,097	74,565	57,920	238,067	3,310,486	4,717,323	629,825	189,199	5,536,347
1986	11,614	31,084	46,864	363,350	3,037,861	5,217,491	929,919	359,365	6,506,775
1987	15,273	25,182	37,949	416,375	3,461,081	5,292,200	958,927	362,065	6,613,192
1988	30,207	41,047	49,156	335,408	3,380,894	5,329,317	822,300	360,336	6,511,953
1989	9,740	54,881	114,203	179,323	3,504,088	5,753,966	851,745	907,609	7,513,320
1990	31,161	69,416	119,309	247,781	3,878,574	6,788,986	1,066,314	883,822	8,739,122
1991	22,434	(18,690)	99,577	262,052	2,514,312	6,796,247	1,067,078	585,008	8,448,333
1992	26,787	332,012	98,670	186,640	3,888,347	9,415,121	1,419,603	673,833	11,508,557
1993	24,845	181,592	94,169	316,045	6,043,803	10,274,070	1,371,074	900,996	12,546,140
1994	28,383	90,791	80,942	416,061	6,404,342	8,451,199	1,325,511	802,217	10,578,927
1995	29,298	64,012	80,278	373,657	5,610,923	10,406,784	2,386,507	959,685	13,752,976
1996	(1,020)	60,610	11,672	312,097	5,322,208	10,246,985	2,604,651	628,177	13,479,813
1997	18,428	95,321	15,691	335,566	4,486,995	10,429,338	1,098,381	2,084,859	13,612,578
1998	26,323	54,255	611,290	658,090	5,577,354	11,409,135	1,449,411	5,364,368	18,222,914
1999	50,555	36,519	430,229	2,035,938	7,682,573	11,604,989	1,444,270	1,338,751	14,388,009
2000	135,659	87,477	185,352	640,387	6,392,010	12,608,781	893,969	641,868	14,144,617
2001	112,967	188,991	197,715	1,048,040	5,409,426	17,554,406	1,386,320	755,810	19,696,537
2002	143,698	171,099	500,887	2,780,200	8,797,032	14,393,881	860,342	618,786	15,873,010
2003	78,088	97,972	248,074	987,795	3,872,737	16,535,395	1,744,997	755,647	19,036,039
2004	156,690	179,275	205,599	454,472	6,302,393	13,910,225	1,213,840	681,865	15,805,930
2005	143,222	202,538	135,810	224,827	5,530,864	12,477,085	1,945,237	877,373	15,299,695
2006	143,293	123,326	79,143	388,556	5,890,438	13,757,327	1,932,792	1,266,705	16,956,825
2007	78,834	118,037	71,987	253,857	7,641,915	12,009,038	1,718,519	642,157	14,369,714
2008	171,199	160,526	238,879	252,919	8,437,395	15,638,323	1,478,170	827,204	17,943,697
2009	84,414	143,589	117,890	628,506	7,700,212	13,702,586	1,087,109	871,311	15,661,005
2010	53,401	580,364	29,668	470,652	7,784,633	13,183,212	2,219,937	1,502,531	16,905,681
2011	83,115	80,700	63,458	485,559	8,102,347	16,703,013	2,832,921	1,460,349	20,996,284
2012	57,150	137,189	66,721	2,514,485	10,855,068	15,276,812	1,416,304	1,364,427	18,057,543
2013	83,988	180,259	103,112	1,189,671	10,790,348	18,688,338	2,188,031	2,713,089	23,589,458
2014	83,265	149,398	87,643	1,066,306	10,871,731	23,838,619	2,200,950	2,308,770	28,348,339
<b>2015</b>	<b>94,862</b>	<b>169,958</b>	<b>99,764</b>	<b>2,707,897</b>	<b>13,802,847</b>	<b>27,196,157</b>	<b>2,302,658</b>	<b>2,112,127</b>	<b>31,610,942</b>
2016	99,092	177,594	104,221	3,277,785	14,853,926	26,127,705	2,347,742	2,196,599	30,672,046
2017	93,330	167,307	98,181	2,374,170	13,307,930	25,978,035	2,306,621	2,227,890	30,512,546
2018	94,263	168,980	99,163	2,397,911	13,441,008	26,237,816	2,329,687	2,250,169	30,817,672
2019	95,206	170,669	100,155	2,421,890	13,575,417	26,500,194	2,352,984	2,272,671	31,125,849
2020	96,158	172,376	101,156	2,446,109	13,711,173	26,765,196	2,376,514	2,295,398	31,437,108
2021	97,120	174,100	102,168	2,470,570	13,848,284	27,032,848	2,400,279	2,318,352	31,751,479
2022	98,091	175,841	103,189	2,495,276	13,986,766	27,303,176	2,424,282	2,341,535	32,068,993
2023	99,072	177,599	104,221	2,520,229	14,126,634	27,576,208	2,448,524	2,364,950	32,389,682
2024	100,062	179,375	105,263	2,545,431	14,267,899	27,851,970	2,473,010	2,388,600	32,713,580
2025	101,063	181,169	106,316	2,570,886	14,410,580	28,130,490	2,497,740	2,412,486	33,040,716
2026	102,074	182,981	107,379	2,596,594	14,554,685	28,411,795	2,522,717	2,436,611	33,371,123
2027	103,094	184,810	108,453	2,622,560	14,700,231	28,695,913	2,547,944	2,460,977	33,704,834
2028	104,125	186,659	109,538	2,648,786	14,847,235	28,982,872	2,573,424	2,485,587	34,041,883
2029	105,167	188,525	110,633	2,675,274	14,995,708	29,272,700	2,599,158	2,510,443	34,382,301
2030	106,218	190,410	111,739	2,702,027	15,145,664	29,565,427	2,625,150	2,535,547	34,726,124
2031	107,280	192,315	112,857	2,729,047	15,297,121	29,861,082	2,651,401	2,560,902	35,073,385
2032	108,353	194,238	113,985	2,756,337	15,450,092	30,159,692	2,677,915	2,586,511	35,424,118
2033	109,437	196,180	115,125	2,783,901	15,604,594	30,461,289	2,704,694	2,612,377	35,778,360
2034	110,531	198,142	116,276	2,811,740	15,760,639	30,765,902	2,731,741	2,638,500	36,136,143
2035	111,637	200,123	117,439	2,839,857	15,918,245	31,073,561	2,759,059	2,664,885	36,497,505
<b>TOTAL</b>	<b>4,163,059</b>	<b>7,922,387</b>	<b>6,784,738</b>	<b>77,306,377</b>	<b>511,506,057</b>	<b>979,303,282</b>	<b>103,595,056</b>	<b>87,640,059</b>	<b>1,170,538,396</b>

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 3 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SAN LUIS DIVISION						SOUTH SAN JOAQUIN DIVISION		
	Reach 3	Reach 4	Reach 5	Reach 6	Reach 7	Subtotal	Reach 8C	Reach 8D	Reach 9
[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	120,038	428,308	130,105	44,591	104,033	827,075	0	0	0
1969	90,033	460,907	184,467	35,696	235,322	1,006,425	22,013	134,760	86,103
1970	89,547	484,300	226,002	66,070	192,582	1,058,501	26,207	156,981	128,273
1971	99,917	541,574	175,592	64,193	158,170	1,039,446	32,312	190,753	118,372
1972	116,708	647,979	174,519	73,670	154,783	1,167,659	35,031	187,242	130,396
1973	116,791	611,705	158,145	58,344	153,955	1,098,940	51,150	225,747	127,530
1974	120,309	671,455	150,835	63,905	150,230	1,156,734	34,752	199,127	131,298
1975	133,593	839,285	178,974	81,478	157,586	1,390,916	78,523	250,377	159,006
1976	54,938	883,956	220,832	90,305	174,835	1,424,866	39,348	133,933	123,424
1977	73,331	1,114,465	270,734	98,132	196,311	1,752,973	38,086	121,348	178,078
1978	45,867	898,992	203,261	106,938	203,079	1,458,137	45,552	178,805	129,928
1979	223,973	842,508	144,055	99,670	180,734	1,490,940	69,973	150,679	129,756
1980	243,507	1,176,463	222,942	127,625	281,860	2,052,397	57,726	274,848	185,155
1981	265,766	1,065,358	193,048	90,533	1,612,157	3,226,862	80,121	198,256	144,187
1982	279,250	1,241,285	209,371	114,421	1,433,180	3,277,507	59,424	269,086	233,494
1983	214,468	1,949,017	339,809	131,377	2,143,678	4,778,349	49,448	383,476	223,078
1984	241,273	2,233,969	335,166	163,858	2,111,386	5,085,652	42,062	458,489	300,924
1985	322,068	2,882,583	360,431	176,577	1,603,532	5,345,191	58,820	495,500	213,368
1986	416,027	2,996,792	472,551	252,188	601,250	4,738,808	90,730	478,786	596,800
1987	362,738	3,104,592	424,107	236,349	439,232	4,567,018	113,962	412,042	446,067
1988	365,209	2,954,186	456,864	231,754	639,242	4,647,255	96,728	379,073	417,991
1989	263,171	3,182,472	393,589	332,986	633,419	4,805,637	83,282	389,698	400,853
1990	397,353	4,011,110	579,073	464,639	729,132	6,181,307	111,019	436,849	515,611
1991	256,473	4,388,184	543,760	728,156	765,765	6,682,338	104,414	496,794	465,940
1992	302,021	3,792,401	795,587	363,134	815,590	6,068,733	118,315	511,982	417,871
1993	439,725	4,337,616	1,008,394	551,849	734,796	7,072,380	230,338	745,885	490,159
1994	282,579	4,376,461	816,129	396,768	492,860	6,364,797	125,398	602,404	572,557
1995	107,995	5,026,076	1,066,971	440,006	1,356,668	7,997,716	185,681	657,282	432,072
1996	1,003,229	4,738,221	931,944	683,323	1,034,376	8,391,093	112,062	416,294	472,350
1997	859,665	5,761,996	924,289	254,934	646,209	8,447,093	128,190	449,316	728,436
1998	690,845	5,520,206	1,242,589	534,931	654,538	8,643,109	115,748	457,845	429,433
1999	601,726	5,793,961	1,220,810	540,364	679,483	8,836,344	107,647	426,289	440,869
2000	708,169	5,826,574	1,028,776	525,073	871,710	8,960,301	103,853	463,578	509,758
2001	(577,350)	7,163,270	850,673	372,421	677,868	8,486,881	58,396	554,622	604,391
2002	1,075,107	5,162,820	664,281	250,085	732,057	7,884,349	54,699	729,884	616,531
2003	1,036,004	6,049,399	747,526	303,818	619,980	8,756,727	62,676	677,693	647,067
2004	622,332	6,885,677	683,988	340,581	581,893	9,114,471	35,756	475,332	335,958
2005	557,910	6,009,442	990,414	405,681	803,967	8,767,414	28,876	405,610	298,819
2006	(44,598)	6,142,480	1,599,743	638,044	930,890	9,266,559	48,023	543,188	798,946
2007	1,115,357	7,692,645	1,976,186	690,292	966,663	12,441,143	242,165	859,626	540,327
2008	888,946	10,702,810	2,170,185	667,440	1,013,607	15,442,988	72,281	461,744	662,054
2009	956,443	8,168,258	1,237,534	510,257	1,170,697	12,043,189	36,915	771,027	482,385
2010	999,014	9,589,825	1,634,518	579,145	1,359,584	14,162,086	68,133	756,249	560,492
2011	1,105,996	7,277,464	2,722,770	573,764	1,605,081	13,285,075	13,618	613,364	803,416
2012	1,630,518	10,363,612	2,306,625	621,033	1,205,447	16,118,465	37,440	735,655	826,959
2013	2,268,790	11,441,413	2,861,781	1,344,646	3,175,861	21,092,491	43,504	678,028	670,408
2014	1,989,152	13,103,942	3,994,033	649,576	2,643,407	22,380,110	66,324	869,079	942,438
<b>2015</b>	<b>2,108,790</b>	<b>13,201,788</b>	<b>3,989,035</b>	<b>643,038</b>	<b>2,966,295</b>	<b>22,908,946</b>	<b>130,437</b>	<b>1,137,167</b>	<b>1,145,177</b>
2016	2,070,736	13,004,295	3,558,772	462,511	2,869,996	21,966,310	99,939	1,072,433	1,125,634
2017	2,076,788	13,234,375	3,885,753	590,891	2,854,832	22,642,639	99,889	1,036,488	1,081,794
2018	2,097,556	13,366,719	3,924,610	596,800	2,883,380	22,869,065	100,888	1,046,853	1,092,612
2019	2,118,532	13,500,386	3,963,856	602,768	2,912,214	23,097,756	101,897	1,057,322	1,103,538
2020	2,139,717	13,635,390	4,003,495	608,796	2,941,336	23,328,734	102,916	1,067,895	1,114,573
2021	2,161,114	13,771,744	4,043,530	614,884	2,970,749	23,562,021	103,945	1,078,574	1,125,719
2022	2,182,725	13,909,462	4,083,965	621,033	3,000,457	23,797,642	104,984	1,089,360	1,136,976
2023	2,204,553	14,048,556	4,124,805	627,243	3,030,461	24,035,618	106,034	1,100,253	1,148,346
2024	2,226,598	14,189,042	4,166,053	633,516	3,060,766	24,275,975	107,095	1,111,256	1,159,829
2025	2,248,864	14,330,932	4,207,713	639,851	3,091,374	24,518,734	108,165	1,122,368	1,171,428
2026	2,271,353	14,474,241	4,249,791	646,249	3,122,287	24,763,921	109,247	1,133,592	1,183,142
2027	2,294,066	14,618,984	4,292,289	652,712	3,153,510	25,011,561	110,340	1,144,928	1,194,973
2028	2,317,007	14,765,174	4,335,211	659,239	3,185,045	25,261,676	111,443	1,156,377	1,206,923
2029	2,340,177	14,912,825	4,378,564	665,831	3,216,896	25,514,293	112,557	1,167,941	1,218,992
2030	2,363,579	15,061,954	4,422,349	672,490	3,249,065	25,769,437	113,683	1,179,620	1,231,182
2031	2,387,215	15,212,573	4,466,573	679,214	3,281,555	26,027,130	114,820	1,191,417	1,243,494
2032	2,411,087	15,364,699	4,511,238	686,007	3,314,371	26,287,402	115,968	1,203,331	1,255,929
2033	2,435,198	15,518,346	4,556,351	692,867	3,347,515	26,550,277	117,128	1,215,364	1,268,488
2034	2,459,550	15,673,529	4,601,914	699,795	3,380,990	26,815,778	118,299	1,227,518	1,281,173
2035	2,484,145	15,830,265	4,647,933	706,793	3,414,800	27,083,936	119,482	1,239,793	1,293,985
<b>TOTAL</b>	<b>70,931,272</b>	<b>502,163,292</b>	<b>128,637,777</b>	<b>29,564,377</b>	<b>105,076,579</b>	<b>836,373,298</b>	<b>5,825,877</b>	<b>44,244,474</b>	<b>43,453,236</b>

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 4 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SOUTH SAN JOAQUIN DIVISION (continued)									
	Reach 10A	Reach 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A	
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	
1961	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	0	0	
1969	83,706	59,077	0	0	0	0	0	0	0	
1970	118,046	85,758	94,171	123,374	152,424	0	0	0	0	
1971	129,811	80,282	95,075	91,389	167,142	691,791	151,979	111,623	529,723	
1972	117,625	84,287	98,647	115,592	146,096	877,535	124,831	101,479	609,058	
1973	117,706	92,257	74,238	114,843	221,385	961,855	120,106	99,429	692,748	
1974	141,658	98,103	74,914	193,523	141,540	898,272	143,866	115,649	853,098	
1975	207,908	124,105	61,799	117,194	108,154	1,156,757	180,614	119,889	988,045	
1976	139,134	69,715	33,655	147,908	134,063	1,124,051	177,086	114,133	1,037,799	
1977	194,086	108,644	91,547	175,039	137,975	1,397,006	203,837	119,467	1,339,196	
1978	168,634	106,702	72,585	170,578	151,120	1,254,043	139,662	132,224	1,265,813	
1979	175,107	85,942	56,331	174,147	150,029	1,490,461	201,935	260,981	1,216,126	
1980	284,207	120,896	123,120	167,249	164,749	1,988,619	189,132	238,607	1,437,614	
1981	199,927	76,965	33,322	113,202	171,669	1,741,488	163,934	161,182	1,799,832	
1982	264,947	158,178	142,631	224,170	224,051	1,793,867	195,086	15,768	1,933,859	
1983	308,801	136,350	124,724	203,733	217,324	2,421,794	199,708	181,879	2,550,842	
1984	396,448	163,331	108,212	188,724	245,764	3,312,127	329,490	204,332	3,215,901	
1985	298,337	198,368	154,995	194,327	360,308	3,463,178	237,127	180,068	3,427,049	
1986	422,493	248,170	242,660	346,410	349,369	3,781,427	320,984	360,156	3,574,451	
1987	488,226	334,059	325,697	469,378	422,824	3,731,912	463,757	238,813	4,080,465	
1988	532,489	290,881	220,658	374,653	318,253	3,451,893	411,110	313,806	3,746,920	
1989	733,030	268,025	207,487	595,433	380,883	3,512,884	333,996	220,978	3,751,081	
1990	651,465	363,652	225,171	480,738	677,729	4,021,727	439,953	212,851	4,381,643	
1991	716,328	328,683	269,873	371,312	433,313	4,309,082	424,704	273,169	4,566,702	
1992	574,145	334,579	270,768	409,314	423,717	4,734,368	729,211	571,412	4,270,793	
1993	723,450	413,722	278,375	496,851	594,201	5,182,830	664,063	423,780	5,266,124	
1994	703,493	346,600	239,873	482,301	445,909	4,012,614	414,899	254,393	3,727,019	
1995	881,902	405,045	242,253	622,654	507,102	4,607,154	309,283	315,905	3,973,757	
1996	984,784	367,570	238,622	519,560	604,736	4,892,967	214,773	187,784	4,331,630	
1997	1,864,113	309,696	254,080	516,115	429,771	5,094,202	261,221	275,610	4,011,366	
1998	1,011,284	295,927	170,556	384,226	484,072	4,752,549	309,440	248,178	4,694,822	
1999	1,161,363	395,036	195,417	423,158	542,097	5,103,420	342,515	221,942	4,894,215	
2000	919,469	404,362	327,150	648,418	562,412	5,945,146	344,498	142,466	5,359,955	
2001	871,889	416,214	896,678	521,912	661,676	4,694,761	(137,575)	(97,259)	6,010,462	
2002	1,308,649	380,653	296,837	958,653	860,806	5,944,088	31,933	251,389	5,591,499	
2003	820,529	340,822	236,702	692,521	615,715	6,174,346	(135,976)	18,962	6,997,457	
2004	606,737	246,360	176,853	626,301	588,304	7,253,252	(136,779)	(164,022)	8,922,010	
2005	900,920	212,972	119,558	851,907	470,209	6,254,986	(178,943)	(189,967)	5,894,365	
2006	493,220	202,083	65,084	769,920	517,797	5,143,741	(153,011)	(161,762)	8,328,125	
2007	636,231	266,168	298,817	554,080	559,096	6,695,046	(417,231)	(330,122)	10,875,861	
2008	945,461	434,790	242,767	426,510	729,151	11,167,443	(230,374)	(179,321)	12,969,188	
2009	931,981	419,268	221,266	622,546	559,861	7,803,541	557,159	(63,395)	8,839,348	
2010	736,973	458,531	123,868	432,084	719,255	7,870,909	(164,664)	(60,101)	6,667,441	
2011	1,171,634	632,354	321,109	880,643	1,594,958	8,884,778	(223,246)	(35,642)	6,276,464	
2012	833,657	815,339	292,731	1,070,464	3,257,177	11,659,244	401,526	457,844	9,460,652	
2013	1,104,041	532,224	499,250	981,181	903,175	13,195,991	303,773	182,158	11,365,168	
2014	1,359,434	796,001	534,409	1,202,574	1,803,643	12,968,083	694,200	502,605	8,709,455	
2015	<b>1,619,545</b>	<b>946,900</b>	<b>735,135</b>	<b>1,420,264</b>	<b>2,346,801</b>	<b>14,068,373</b>	<b>999,260</b>	<b>558,458</b>	<b>8,563,258</b>	
2016	1,505,304	949,653	625,104	1,417,367	2,239,477	14,590,119	879,397	582,226	8,813,268	
2017	1,509,709	906,493	637,864	1,360,202	2,151,274	14,014,280	866,195	553,241	8,782,280	
2018	1,524,806	915,558	644,243	1,373,804	2,172,786	14,154,423	874,857	558,773	8,870,103	
2019	1,540,054	924,714	650,686	1,387,542	2,194,514	14,295,967	883,606	564,361	8,958,804	
2020	1,555,454	933,961	657,192	1,401,418	2,216,459	14,438,927	892,442	570,004	9,048,392	
2021	1,571,009	943,300	663,764	1,415,432	2,238,624	14,583,316	901,366	575,704	9,138,876	
2022	1,586,719	952,733	670,402	1,429,586	2,261,010	14,729,149	910,380	581,461	9,230,265	
2023	1,602,586	962,261	677,106	1,443,882	2,283,620	14,876,441	919,484	587,276	9,322,567	
2024	1,618,612	971,883	683,877	1,458,321	2,306,457	15,025,205	928,678	593,149	9,415,793	
2025	1,634,798	981,602	690,716	1,472,904	2,329,521	15,175,457	937,965	599,080	9,509,951	
2026	1,651,146	991,418	697,623	1,487,633	2,352,816	15,327,212	947,345	605,071	9,605,051	
2027	1,667,658	1,001,332	704,599	1,502,510	2,376,345	15,480,484	956,818	611,122	9,701,101	
2028	1,684,334	1,011,346	711,645	1,517,535	2,400,108	15,635,289	966,387	617,233	9,798,112	
2029	1,701,177	1,021,459	718,762	1,532,710	2,424,109	15,791,642	976,050	623,405	9,896,093	
2030	1,718,189	1,031,674	725,949	1,548,037	2,448,350	15,949,558	985,811	629,639	9,995,054	
2031	1,735,371	1,041,991	733,209	1,563,518	2,472,834	16,109,054	995,669	635,936	10,095,005	
2032	1,752,725	1,052,410	740,541	1,579,153	2,497,562	16,270,144	1,005,626	642,295	10,195,955	
2033	1,770,252	1,062,935	747,946	1,594,944	2,522,538	16,432,846	1,015,682	648,718	10,297,914	
2034	1,787,955	1,073,564	755,426	1,610,894	2,547,763	16,597,174	1,025,839	655,205	10,400,893	
2035	1,805,834	1,084,300	762,980	1,627,003	2,573,241	16,763,146	1,036,097	661,757	10,504,902	
TOTAL	62,978,716	33,870,233	24,109,303	51,391,466	73,167,211	527,725,432	28,858,547	19,203,434	404,578,777	



**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 5 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SOUTH SAN JOAQUIN DIVISION (continued)		TEHACHAPI DIVISION			MOJAVE DIVISION			
	Reach 16A	Subtotal	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 20A	Reach 20B
[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	385,659	0	0	0	0	0	0	0
1970	0	885,234	0	0	0	0	0	0	0
1971	10,291	2,400,543	3,471	0	3,471	0	0	0	0
1972	1,106,884	3,734,703	1,424,782	28,127	1,452,909	36,699	135,675	130,711	120,271
1973	1,243,941	4,142,935	1,777,260	49,949	1,827,209	36,207	146,739	161,838	148,631
1974	1,343,972	4,369,772	2,298,091	16,259	2,314,350	30,525	90,404	115,571	88,200
1975	1,537,862	5,090,233	2,403,430	35,193	2,438,623	40,588	122,584	137,684	118,898
1976	1,727,428	5,001,677	2,776,194	126,653	2,902,847	118,610	201,215	182,927	151,555
1977	1,961,081	6,065,390	3,845,464	83,936	3,929,400	93,565	226,906	180,884	112,589
1978	1,922,950	5,738,596	2,954,313	42,637	2,996,950	91,815	200,759	215,673	120,584
1979	1,798,566	5,960,033	3,539,402	45,997	3,585,399	99,670	307,386	261,205	194,104
1980	2,231,456	7,463,378	4,749,245	54,806	4,804,051	116,487	446,175	290,719	237,250
1981	2,762,773	7,646,858	5,485,957	64,886	5,550,843	316,590	585,003	325,112	292,081
1982	2,961,383	8,475,944	6,349,080	55,997	6,405,077	447,739	638,615	275,763	330,502
1983	4,302,165	11,303,322	14,153,033	96,397	14,249,430	345,229	564,698	368,139	326,767
1984	5,077,824	14,043,628	18,448,383	77,201	18,525,584	267,497	563,588	413,443	329,933
1985	5,683,454	14,964,899	18,134,698	137,928	18,272,626	298,932	475,028	450,444	388,327
1986	5,780,666	16,593,102	19,297,129	109,938	19,407,067	703,413	350,906	347,690	315,566
1987	5,636,043	17,063,245	17,398,908	98,355	17,497,263	1,261,056	558,996	818,475	357,971
1988	5,150,238	15,704,693	17,697,838	138,405	17,836,243	1,242,139	560,911	585,014	400,005
1989	5,458,633	16,336,263	17,641,151	88,488	17,729,639	1,049,615	283,065	366,590	345,614
1990	6,440,643	18,959,051	19,995,760	99,868	20,095,628	1,298,537	229,083	469,502	202,412
1991	5,805,189	18,565,503	19,903,346	131,558	20,034,904	1,432,360	665,443	1,025,089	516,257
1992	6,471,964	19,838,439	18,194,788	279,610	18,474,398	1,167,898	738,238	666,181	696,623
1993	7,583,165	23,092,943	19,051,939	199,640	19,251,579	1,868,745	606,763	1,232,409	818,675
1994	7,142,378	19,069,838	17,354,702	204,963	17,559,665	1,699,479	763,493	1,145,700	957,350
1995	6,540,575	19,680,665	19,360,033	191,516	19,551,549	1,284,146	614,314	1,941,939	2,411,412
1996	7,065,052	20,408,184	19,041,451	237,846	19,279,297	1,163,708	576,674	1,335,804	1,713,145
1997	7,387,904	21,710,020	19,724,881	176,120	19,901,001	1,330,450	730,628	1,401,562	2,043,179
1998	7,530,927	20,885,007	23,227,152	182,754	23,409,906	1,513,656	309,052	7,568,901	508,030
1999	8,835,442	23,089,410	19,935,886	160,568	20,096,454	3,153,935	732,113	5,398,788	1,667,027
2000	12,461,593	28,192,658	23,226,081	243,938	23,470,019	1,868,145	727,509	1,371,226	1,426,706
2001	15,789,253	30,845,420	24,050,600	618,564	24,669,164	2,441,255	2,555,606	1,847,442	1,531,140
2002	11,455,167	28,280,787	20,735,130	472,442	21,207,572	1,399,590	801,160	757,658	584,504
2003	11,513,908	28,662,421	20,858,664	283,463	21,142,127	3,736,202	678,826	711,735	625,670
2004	14,650,087	33,616,149	26,623,316	246,187	26,869,503	1,825,870	1,375,392	1,323,174	1,044,919
2005	13,868,124	28,937,435	16,422,658	1,499,101	17,921,759	2,846,659	1,504,362	1,543,781	881,513
2006	13,772,913	30,368,266	14,890,936	310,206	15,201,142	4,469,616	1,325,272	1,211,281	2,931,855
2007	8,487,997	29,268,062	15,976,692	386,759	16,363,451	5,933,584	1,646,236	1,807,800	1,834,230
2008	10,975,053	38,676,747	23,356,162	374,259	23,730,420	2,308,771	1,390,881	1,274,043	844,356
2009	13,359,019	34,540,921	23,125,859	195,137	23,320,995	2,560,949	1,546,003	1,345,619	1,172,401
2010	9,603,667	27,772,837	14,303,011	310,327	14,613,338	3,440,973	1,636,435	2,641,266	1,754,357
2011	15,968,252	36,901,701	18,849,835	179,951	19,029,786	2,577,809	1,786,735	2,323,763	2,225,033
2012	13,129,166	42,977,854	21,394,842	261,265	21,656,107	5,144,729	1,524,195	1,654,924	2,757,133
2013	16,168,004	46,626,905	35,372,632	301,684	35,674,316	6,217,344	1,782,687	1,387,730	3,196,153
2014	17,626,670	48,074,915	32,474,610	255,509	32,730,119	5,066,442	1,516,101	1,688,738	3,713,757
<b>2015</b>	<b>15,659,583</b>	<b>49,330,358</b>	<b>31,380,418</b>	<b>288,895</b>	<b>31,669,313</b>	<b>8,007,711</b>	<b>1,672,034</b>	<b>1,889,781</b>	<b>2,676,225</b>
2016	17,381,573	51,281,494	27,816,659	301,708	28,118,367	5,990,349	1,733,271	1,966,440	2,787,719
2017	17,058,168	50,057,877	30,862,801	284,857	31,147,658	6,418,382	1,656,874	1,866,803	3,089,826
2018	17,228,749	50,558,455	31,171,429	287,706	31,459,135	6,482,566	1,673,442	1,885,471	3,120,725
2019	17,401,037	51,064,042	31,483,144	290,583	31,773,727	6,547,392	1,690,177	1,904,326	3,151,932
2020	17,575,047	51,574,680	31,797,975	293,489	32,091,464	6,612,866	1,707,079	1,923,369	3,183,451
2021	17,750,798	52,090,427	32,115,955	296,424	32,412,379	6,678,994	1,724,149	1,942,603	3,215,286
2022	17,928,306	52,611,331	32,437,114	299,388	32,736,502	6,745,784	1,741,391	1,962,029	3,247,439
2023	18,107,589	53,137,445	32,761,485	302,382	33,063,867	6,813,242	1,758,805	1,981,649	3,279,913
2024	18,288,665	53,668,820	33,089,100	305,406	33,394,506	6,881,375	1,776,393	2,001,466	3,312,712
2025	18,471,551	54,205,506	33,419,991	308,460	33,728,451	6,950,188	1,794,157	2,021,480	3,345,839
2026	18,656,267	54,747,563	33,754,191	311,544	34,065,735	7,019,690	1,812,098	2,041,695	3,379,298
2027	18,842,830	55,295,040	34,091,733	314,660	34,406,393	7,089,887	1,830,219	2,062,112	3,413,091
2028	19,031,258	55,847,990	34,432,650	317,806	34,750,456	7,160,786	1,848,522	2,082,733	3,447,221
2029	19,221,570	56,406,467	34,776,977	320,984	35,097,961	7,232,394	1,867,007	2,103,561	3,481,694
2030	19,413,786	56,970,532	35,124,747	324,194	35,448,941	7,304,718	1,885,677	2,124,596	3,516,511
2031	19,607,924	57,540,242	35,475,994	327,436	35,803,430	7,377,765	1,904,534	2,145,842	3,551,676
2032	19,804,003	58,115,642	35,830,754	330,711	36,161,465	7,451,543	1,923,579	2,167,301	3,587,192
2033	20,002,043	58,696,798	36,189,062	334,018	36,523,080	7,526,058	1,942,815	2,188,974	3,623,064
2034	20,202,064	59,283,767	36,550,952	337,358	36,888,310	7,601,319	1,962,243	2,210,863	3,659,295
2035	20,404,084	59,876,604	36,916,462	340,731	37,257,193	7,677,332	1,981,865	2,232,972	3,695,888
<b>TOTAL</b>	<b>715,366,620</b>	<b>2,034,773,326</b>	<b>1,389,308,387</b>	<b>15,673,126</b>	<b>1,404,981,513</b>	<b>221,917,569</b>	<b>72,108,184</b>	<b>93,410,004</b>	<b>112,202,681</b>

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 6 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	MOJAVE DIVISION (continued)						SANTA ANA DIVISION		
	Reach 21	Reach 22A	Reach 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	Reach 28G
[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	75,768	80,436	1,036,831	51,520	362,153	2,030,064	26	578	109
1973	60,641	66,539	1,283,816	65,475	353,262	2,323,148	20,541	679,328	136,352
1974	65,007	77,667	1,477,946	96,340	334,302	2,375,962	24,380	799,400	155,262
1975	135,462	77,825	1,630,554	111,141	419,450	2,794,186	29,337	885,021	110,729
1976	106,314	131,007	1,598,071	107,787	304,638	2,902,124	51,356	1,103,139	138,575
1977	98,757	86,279	1,882,080	71,228	48,359	2,800,647	62,584	1,412,740	127,543
1978	109,271	71,763	2,211,965	72,179	637,401	3,731,410	67,186	1,159,950	166,919
1979	203,078	121,586	2,104,832	76,960	202,566	3,571,387	84,462	1,235,189	142,586
1980	156,794	117,274	2,670,387	147,009	688,605	4,870,700	72,651	1,532,535	158,340
1981	181,062	119,602	3,030,407	134,895	47,750	5,032,502	35,662	1,575,444	160,053
1982	186,109	125,429	3,248,883	299,712	623,755	6,176,507	26,852	1,822,250	205,350
1983	219,943	140,523	3,899,769	223,626	384,292	6,472,986	19,017	1,663,599	244,720
1984	266,919	146,866	4,783,997	59,337	1,104,149	7,935,729	11,319	2,325,661	240,496
1985	799,514	125,780	5,330,501	261,135	181,346	8,941,007	17,764	2,707,662	451,600
1986	242,158	178,847	6,190,812	156,053	515,945	9,001,390	31,012	2,768,728	439,048
1987	298,190	236,263	5,731,239	151,796	732,607	10,146,593	19,362	2,847,390	278,094
1988	331,099	149,876	6,910,472	253,833	970,052	11,403,401	36,576	3,087,873	271,868
1989	194,047	138,825	5,963,386	349,544	1,242,144	9,932,830	30,881	3,190,809	230,953
1990	273,748	49,174	6,905,442	436,785	1,891,053	11,755,736	25,518	3,330,913	437,812
1991	478,555	231,223	7,488,366	263,723	1,561,051	13,662,067	32,172	3,847,589	843,388
1992	585,072	168,251	7,076,997	317,042	622,116	12,038,418	55,819	4,043,878	281,864
1993	509,309	207,818	7,765,751	359,632	1,708,915	15,078,017	72,464	5,638,325	382,195
1994	873,215	241,679	7,691,548	1,220,795	1,245,936	15,839,195	105,373	5,139,991	617,136
1995	355,198	179,930	6,994,639	842,041	746,371	15,369,990	96,781	4,357,648	1,308,828
1996	790,618	136,397	8,590,347	889,842	(78,782)	15,117,753	156,395	4,051,744	1,001,063
1997	640,177	189,241	8,138,580	1,586,227	3,355,446	19,415,490	177,217	4,585,198	493,841
1998	297,621	115,100	8,887,728	1,924,868	1,134,837	22,259,793	142,703	4,856,225	379,997
1999	1,395,062	188,629	9,516,356	2,034,226	1,222,891	25,309,026	190,302	6,039,135	503,433
2000	967,602	162,166	9,556,103	1,711,058	1,516,573	19,307,088	353,556	4,201,190	842,570
2001	1,073,766	478,385	7,663,929	1,891,894	17,570	19,500,989	296,466	2,423,837	1,667,769
2002	1,156,711	282,353	11,250,023	1,693,719	935,850	18,861,569	509,124	3,399,580	1,250,579
2003	470,229	279,963	13,362,824	2,096,448	(448,817)	21,513,080	368,569	3,734,728	546,222
2004	1,055,076	412,817	10,521,892	2,128,941	1,093,259	20,781,339	427,841	5,444,207	1,239,624
2005	678,931	353,226	7,631,576	2,415,938	2,247,415	20,103,400	452,766	5,618,987	1,520,387
2006	966,130	761,184	10,128,229	1,935,142	607,261	24,335,969	341,883	5,175,790	651,139
2007	835,427	663,829	10,088,036	2,983,930	688,771	26,481,844	273,241	8,089,661	843,490
2008	507,092	719,590	14,759,592	2,445,001	1,052,780	25,302,105	368,544	6,646,631	835,369
2009	779,054	544,665	12,289,156	3,487,947	1,540,196	25,265,990	548,312	7,201,039	643,883
2010	798,753	711,463	12,904,348	3,288,540	2,936,201	30,112,336	660,583	6,601,503	500,609
2011	629,630	587,995	13,553,877	4,127,547	3,355,011	31,167,399	477,176	5,585,096	902,680
2012	1,837,643	677,716	13,821,944	2,903,551	4,958,168	35,280,004	285,088	6,394,216	1,755,812
2013	1,502,356	565,424	15,514,570	3,773,469	4,016,625	37,956,359	491,569	8,435,841	915,000
2014	956,771	1,565,751	19,265,164	4,137,985	3,443,577	41,354,286	480,755	10,671,667	1,377,716
2015	1,062,151	595,903	19,324,468	4,670,566	3,741,846	43,640,685	545,101	9,981,374	1,571,151
2016	1,105,615	618,656	20,147,471	4,886,371	3,871,848	43,107,740	570,182	10,441,008	1,641,826
2017	1,051,927	936,038	19,774,824	4,610,624	3,722,615	43,127,913	537,333	10,468,330	1,545,533
2018	1,062,446	945,398	19,972,573	4,656,730	3,759,841	43,559,192	542,706	10,573,013	1,560,989
2019	1,073,071	954,852	20,172,298	4,703,297	3,797,439	43,994,784	548,134	10,678,743	1,576,599
2020	1,083,802	964,401	20,374,021	4,750,330	3,835,414	44,434,733	553,615	10,785,531	1,592,365
2021	1,094,640	974,045	20,577,762	4,797,834	3,873,768	44,879,081	559,151	10,893,386	1,608,288
2022	1,105,586	983,785	20,783,539	4,845,812	3,912,505	45,327,870	564,743	11,002,320	1,624,371
2023	1,116,642	993,623	20,991,375	4,894,270	3,951,630	45,781,149	570,390	11,112,343	1,640,615
2024	1,127,808	1,003,559	21,201,288	4,943,213	3,991,147	46,238,961	576,094	11,223,466	1,657,021
2025	1,139,086	1,013,595	21,413,301	4,992,645	4,031,058	46,701,349	581,855	11,335,701	1,673,591
2026	1,150,477	1,023,731	21,627,434	5,042,571	4,071,369	47,168,363	587,673	11,449,058	1,690,327
2027	1,161,982	1,033,968	21,843,708	5,092,997	4,112,082	47,640,046	593,550	11,563,549	1,707,230
2028	1,173,602	1,044,308	22,062,146	5,143,927	4,153,203	48,116,448	599,486	11,679,184	1,724,303
2029	1,185,338	1,054,751	22,282,767	5,195,366	4,194,735	48,597,613	605,480	11,795,976	1,741,546
2030	1,197,191	1,065,298	22,505,595	5,247,320	4,236,683	49,083,589	611,535	11,913,936	1,758,961
2031	1,209,163	1,075,951	22,730,651	5,299,793	4,279,049	49,574,424	617,651	12,033,075	1,776,551
2032	1,221,255	1,086,711	22,957,957	5,352,791	4,321,840	50,070,169	623,827	12,153,406	1,794,316
2033	1,233,467	1,097,578	23,187,537	5,406,319	4,365,058	50,570,870	630,065	12,274,940	1,812,259
2034	1,245,802	1,108,554	23,419,412	5,460,382	4,408,709	51,076,579	636,366	12,397,689	1,830,382
2035	1,258,260	1,119,639	23,653,606	5,514,986	4,452,796	51,587,344	642,730	12,521,666	1,848,686
TOTAL	48,203,189	33,360,700	773,356,698	159,094,006	136,237,685	1,649,890,716	20,328,851	404,589,609	60,777,913

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 7 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	SANTA ANA DIVISION (continued)			SANTA ANA DIVISION - EAST BRANCH EXTENSION					
	Reach 28H	Reach 28J	Subtotal	Reach 1	Reach 2A	Reach 2B	Reach 2C	Reach 2D	Reach 3A
[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]	[64]	
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0
1972	30	0	743	0	0	0	0	0	0
1973	79	0	836,300	0	0	0	0	0	0
1974	34,693	854,637	1,868,372	0	0	0	0	0	0
1975	69,082	723,814	1,817,983	0	0	0	0	0	0
1976	100,400	635,853	2,029,323	0	0	0	0	0	0
1977	92,647	825,880	2,521,394	0	0	0	0	0	0
1978	68,363	835,082	2,297,500	0	0	0	0	0	0
1979	92,812	265,525	1,820,574	0	0	0	0	0	0
1980	129,897	1,120,131	3,013,554	0	0	0	0	0	0
1981	111,722	333,550	2,216,431	0	0	0	0	0	0
1982	135,463	1,518,759	3,708,674	0	0	0	0	0	0
1983	124,651	412,806	2,464,793	0	0	0	0	0	0
1984	190,924	769,068	3,537,468	0	0	0	0	0	0
1985	182,242	871,492	4,230,760	0	0	0	0	0	0
1986	256,526	982,332	4,477,646	0	0	0	0	0	0
1987	218,717	1,118,529	4,482,092	0	0	0	0	0	0
1988	200,811	1,176,659	4,773,787	0	0	0	0	0	0
1989	281,861	1,130,035	4,864,539	0	0	0	0	0	0
1990	308,144	1,538,449	5,640,836	0	0	0	0	0	0
1991	632,912	1,630,321	6,986,382	0	0	0	0	0	0
1992	5,636,464	1,102,519	11,120,544	0	0	0	0	0	0
1993	570,563	994,721	7,658,268	0	0	0	0	0	0
1994	415,603	1,022,412	7,300,515	0	0	0	0	0	0
1995	704,154	894,338	7,361,749	0	0	0	0	0	0
1996	1,041,697	1,316,493	7,567,392	0	0	0	0	0	0
1997	949,188	953,590	7,159,034	0	0	0	0	0	0
1998	991,426	(67,444)	6,302,907	0	0	0	0	0	0
1999	1,970,921	1,084,943	9,788,735	0	0	0	0	0	0
2000	1,003,213	1,120,734	7,521,262	0	0	0	0	0	0
2001	810,651	5,720,030	10,918,752	0	0	0	0	0	0
2002	422,825	2,237,335	7,819,442	0	0	0	0	0	0
2003	376,281	1,284,633	6,310,434	1,022	84,351	375,153	2,329	0	627,038
2004	440,803	3,574,302	11,126,777	10,740	40,841	509,089	2,340	0	276,019
2005	685,061	(1,896,912)	6,380,288	9,849	15,079	526,273	4,153	0	496,547
2006	337,031	5,219,057	11,724,900	9,948	10,190	532,526	9,248	44,735	394,360
2007	728,407	3,324,554	13,259,352	26,756	9,770	633,628	5,011	101,668	602,789
2008	806,404	4,637,283	13,294,231	75,282	34,251	817,827	1,293	180,257	1,286,397
2009	693,113	2,763,458	11,849,806	77,413	17,652	961,959	889	180,036	951,411
2010	450,622	3,625,659	11,838,975	52,183	3,454	777,383	15,404	210,312	1,184,558
2011	586,753	4,885,657	12,437,362	20,761	5,360	672,497	4,301	90,923	993,202
2012	572,159	4,170,551	13,177,826	6,700	16,238	740,372	16,215	134,147	1,437,484
2013	777,383	2,454,784	13,074,578	1,090	5,794	594,386	189,763	190,482	1,446,122
2014	741,602	2,938,061	16,209,801	10,779	9,631	758,710	81,462	158,149	1,470,651
<b>2015</b>	<b>844,409</b>	<b>3,151,800</b>	<b>16,093,835</b>	<b>12,340</b>	<b>11,003</b>	<b>869,551</b>	<b>86,802</b>	<b>194,732</b>	<b>1,697,685</b>
2016	881,764	3,220,832	16,755,612	12,901	11,506	908,664	91,540	197,612	1,764,217
2017	830,818	3,134,601	16,516,615	12,127	10,821	854,098	87,467	185,333	1,660,626
2018	839,126	3,165,947	16,681,781	12,248	10,929	862,639	88,342	187,186	1,677,232
2019	847,517	3,197,606	16,848,599	12,371	11,039	871,266	89,225	189,058	1,694,004
2020	855,993	3,229,582	17,017,086	12,495	11,149	879,978	90,117	190,949	1,710,944
2021	864,552	3,261,878	17,187,255	12,619	11,261	888,778	91,019	192,858	1,728,054
2022	873,198	3,294,497	17,359,129	12,746	11,373	897,666	91,929	194,787	1,745,334
2023	881,930	3,327,442	17,532,720	12,873	11,487	906,643	92,848	196,735	1,762,788
2024	890,749	3,360,716	17,708,046	13,002	11,602	915,709	93,776	198,702	1,780,416
2025	899,657	3,394,323	17,885,127	13,132	11,718	924,866	94,714	200,689	1,798,220
2026	908,653	3,428,267	18,063,978	13,263	11,835	934,115	95,661	202,696	1,816,202
2027	917,740	3,462,549	18,244,618	13,396	11,953	943,456	96,618	204,723	1,834,364
2028	926,917	3,497,175	18,427,065	13,530	12,073	952,891	97,584	206,770	1,852,708
2029	936,186	3,532,146	18,611,334	13,665	12,194	962,419	98,560	208,838	1,871,235
2030	945,548	3,567,468	18,797,448	13,802	12,315	972,044	99,546	210,926	1,889,947
2031	955,004	3,603,143	18,985,424	13,940	12,439	981,764	100,541	213,035	1,908,847
2032	964,554	3,639,174	19,175,277	14,079	12,563	991,582	101,546	215,166	1,927,935
2033	974,199	3,675,566	19,367,029	14,220	12,689	1,001,498	102,562	217,317	1,947,214
2034	983,941	3,712,321	19,560,699	14,362	12,816	1,011,513	103,588	219,491	1,966,687
2035	993,781	3,749,445	19,756,308	14,506	12,944	1,021,628	104,623	221,686	1,986,353
<b>TOTAL</b>	<b>43,960,535</b>	<b>141,710,159</b>	<b>671,367,067</b>	<b>580,140</b>	<b>500,320</b>	<b>27,452,571</b>	<b>2,331,014</b>	<b>5,539,998</b>	<b>49,187,590</b>

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 8 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	SANTA ANA DIVISION - EAST BRANCH EXTENSION (continued)				WEST BRANCH						
	Reach 3B	Reach 4A	Reach 4B	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	Reach 30	Subtotal
[65]	[66]	[67]	[68]	[69]	[70]	[71]	[72]	[73]	[74]	[75]	
1961	0	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	719,255	159,249	199,145	234,196	88,198	420,789	1,820,832
1973	0	0	0	0	779,949	339,363	122,664	264,850	119,743	621,431	2,248,000
1974	0	0	0	0	883,312	158,366	112,458	350,160	(4,525)	723,949	2,223,720
1975	0	0	0	0	1,049,990	176,676	194,724	801,457	75,870	841,991	3,140,708
1976	0	0	0	0	1,220,429	215,588	202,591	624,614	98,268	(650,944)	1,710,546
1977	0	0	0	0	1,268,813	116,939	218,129	684,679	184	634,581	2,923,325
1978	0	0	0	0	1,174,708	342,479	267,308	415,641	17,764	3,088,954	5,306,854
1979	0	0	0	0	1,366,942	285,575	284,188	972,584	29,850	958,068	3,897,207
1980	0	0	0	0	1,698,215	224,472	455,619	874,259	288,303	222,549	3,763,417
1981	0	0	0	0	1,783,405	123,264	615,047	2,305,110	8,794	1,093,897	5,929,517
1982	0	0	0	0	1,919,979	190,500	702,265	2,208,264	414,230	978,624	6,413,862
1983	0	0	0	0	2,739,814	149,333	888,475	745,939	579,882	3,698,681	8,802,124
1984	0	0	0	0	3,463,038	81,260	2,358,495	537,207	719,282	755,136	7,914,418
1985	0	0	0	0	3,866,946	295,836	3,047,591	975,729	614,735	1,753,355	10,554,192
1986	0	0	0	0	3,791,427	457,604	2,893,171	1,480,015	1,032,216	1,338,657	10,993,090
1987	0	0	0	0	3,423,494	213,106	2,933,342	944,604	459,398	1,406,519	9,380,463
1988	0	0	0	0	3,447,403	255,113	3,017,463	883,714	446,468	1,452,589	9,502,750
1989	0	0	0	0	4,025,641	405,583	2,738,143	1,398,165	865,738	1,505,029	10,938,299
1990	0	0	0	0	4,088,481	383,655	3,232,445	3,153,869	777,713	847,500	12,483,663
1991	0	0	0	0	3,862,056	304,143	3,550,063	639,527	763,037	1,191,090	10,309,916
1992	0	0	0	0	4,286,050	327,802	3,892,480	1,014,551	872,953	2,259,032	12,652,868
1993	0	0	0	0	3,969,075	343,304	4,515,385	1,670,952	852,208	1,157,876	12,508,800
1994	0	0	0	0	3,649,861	293,376	3,359,381	1,879,417	872,624	1,674,576	11,729,235
1995	0	0	0	0	4,137,046	883,315	4,750,275	1,588,080	754,904	(421,879)	11,691,741
1996	0	0	0	0	4,511,858	966,044	3,593,671	4,208,195	877,111	1,574,098	15,730,977
1997	0	0	0	0	4,543,506	1,030,809	2,429,066	3,755,901	1,597,361	1,521,491	14,878,134
1998	0	0	0	0	4,871,761	464,376	3,473,405	2,398,630	1,996,114	1,291,185	14,495,471
1999	0	0	0	0	4,859,457	4,249,651	4,989,423	1,764,943	1,005,565	1,911,025	18,780,064
2000	0	0	0	0	5,444,691	774,398	4,265,267	2,284,579	170,222	1,536,126	14,475,283
2001	0	0	0	0	5,907,524	1,539,363	5,136,046	4,410,076	240,652	(966,591)	16,267,071
2002	0	0	0	0	5,325,201	1,490,197	4,067,608	4,478,209	(52,904)	3,472,130	18,780,441
2003	360	93,305	33,614	1,217,171	4,462,511	1,315,154	3,728,869	3,353,017	(627,463)	955,435	13,187,523
2004	337	13,434	71,444	924,242	8,923,655	1,375,960	3,491,591	5,119,984	(615,245)	1,511,921	19,807,866
2005	9,036	27,330	216,418	1,304,685	5,774,589	2,598,959	7,397,492	(590,618)	2,650,320	(1,238,200)	16,592,542
2006	989	14,574	69,398	1,085,967	6,907,485	2,319,199	5,174,952	3,587,177	(519,712)	(4,215,336)	13,253,764
2007	58,094	37,495	132,153	1,607,361	5,723,466	2,742,057	10,506,487	7,867,028	417,145	12,144,943	39,401,127
2008	90,794	74,751	221,882	2,782,734	8,326,282	861,429	16,323,195	7,497,346	(29,172)	565,261	33,544,340
2009	24,066	136,419	215,359	2,565,203	7,858,507	904,257	8,704,442	5,634,621	302,033	2,909,688	26,313,548
2010	9,189	160,106	327,896	2,740,486	10,095,308	822,059	8,995,705	6,339,208	500,328	5,459,010	32,211,618
2011	10,638	72,917	515,538	2,386,139	6,963,100	956,926	9,692,691	8,073,915	105,572	(149,849)	25,642,355
2012	27,237	20,007	186,224	2,584,624	7,589,175	3,022,249	9,555,983	6,633,661	174,660	7,081,649	34,057,377
2013	4,390	6,342	176,082	2,614,452	9,403,490	3,961,295	12,876,223	7,763,373	470,045	4,092,496	38,566,922
2014	16,122	37,451	332,032	2,874,987	9,768,946	1,721,962	9,935,652	5,737,348	283,145	4,444,500	31,891,553
2015	18,387	42,762	379,885	3,313,147	11,293,374	1,902,399	11,275,424	7,038,182	319,163	5,845,464	37,674,006
2016	19,229	44,718	396,689	3,447,076	10,740,014	1,971,742	11,791,425	7,310,403	333,952	5,747,306	37,894,842
2017	18,092	42,060	373,230	3,243,854	10,706,786	1,884,022	11,110,842	6,762,264	315,207	5,399,215	36,178,336
2018	18,273	42,481	376,963	3,276,293	10,813,854	1,902,862	11,221,951	6,829,887	318,359	5,453,207	36,540,120
2019	18,456	42,906	380,732	3,309,057	10,921,992	1,921,891	11,334,170	6,898,186	321,643	5,507,739	36,905,521
2020	18,640	43,335	384,540	3,342,147	11,031,212	1,941,109	11,447,512	6,967,167	324,758	5,562,816	37,274,574
2021	18,827	43,768	388,385	3,375,569	11,141,524	1,960,521	11,561,987	7,036,839	328,006	5,618,444	37,647,321
2022	19,015	44,206	392,269	3,409,325	11,252,939	1,980,126	11,677,607	7,107,208	331,286	5,674,629	38,023,795
2023	19,205	44,648	396,192	3,443,419	11,365,468	1,999,927	11,794,383	7,178,280	334,598	5,731,375	38,404,032
2024	19,397	45,094	400,153	3,477,851	11,479,124	2,019,926	11,912,327	7,250,062	337,944	5,788,689	38,788,072
2025	19,591	45,545	404,155	3,512,630	11,593,915	2,040,126	12,031,450	7,322,563	341,324	5,846,576	39,175,954
2026	19,787	46,001	408,197	3,547,757	11,709,854	2,060,527	12,151,765	7,395,789	344,737	5,905,041	39,567,713
2027	19,985	46,461	412,279	3,583,235	11,826,952	2,081,132	12,273,282	7,469,747	348,184	5,964,092	39,963,389
2028	20,185	46,926	416,401	3,619,068	11,945,222	2,101,943	12,396,015	7,544,444	351,666	6,023,733	40,363,023
2029	20,387	47,395	420,565	3,655,258	12,064,674	2,122,963	12,519,975	7,619,888	355,183	6,083,970	40,766,653
2030	20,591	47,869	424,771	3,691,811	12,185,321	2,144,192	12,645,175	7,696,087	358,735	6,144,810	41,174,320
2031	20,796	48,347	429,019	3,728,728	12,307,174	2,165,634	12,771,627	7,773,048	362,322	6,206,258	41,586,063
2032	21,004	48,831	433,309	3,766,015	12,430,246	2,187,291	12,899,343	7,850,779	365,945	6,268,320	42,001,924
2033	21,214	49,319	437,642	3,803,675	12,554,548	2,209,164	13,028,336	7,929,286	369,605	6,331,004	42,421,943
2034	21,427	49,812	442,018	3,841,714	12,680,094	2,231,255	13,158,620	8,008,579	373,301	6,394,314	42,846,163
2035	21,641	50,310	446,439	3,880,130	12,806,895	2,253,568	13,290,206	8,088,665	377,034	6,458,257	43,274,625
TOTAL	665,380	1,656,924	11,041,872	98,955,810	434,727,024	82,924,565	433,182,036	272,041,529	26,906,465	195,408,291	1,445,189,911

**TABLE B-11 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge**

(in dollars)

Sheet 9 of 9

Calendar Year	CALIFORNIA AQUEDUCT (continued)						Total [82]	GRAND TOTAL [83]
	COASTAL BRANCH							
	Reach 31A (a) [76]	Reach 33A [77]	Reach 33B [78]	Reach 34 [79]	Reach 35 [80]	Subtotal [81]		
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	42,918
1963	0	0	0	0	0	0	0	168,358
1964	0	0	0	0	0	0	0	184,729
1965	0	0	0	0	0	0	0	378,874
1966	0	0	0	0	0	0	0	408,397
1967	0	0	0	0	0	0	0	634,505
1968	0	0	0	0	0	0	2,160,548	2,745,160
1969	509,728	0	0	0	0	509,728	3,324,718	4,074,939
1970	609,988	0	0	0	0	609,988	3,983,062	4,676,282
1971	699,052	0	0	0	0	699,052	5,614,013	6,185,714
1972	697,576	0	0	0	0	697,576	12,353,356	12,998,869
1973	641,626	0	0	0	0	641,626	14,590,688	15,194,233
1974	669,279	0	0	0	0	669,279	16,598,762	17,372,561
1975	806,429	0	0	0	0	806,429	19,569,999	20,517,423
1976	840,927	0	0	0	0	840,927	19,002,859	20,027,213
1977	872,169	0	0	0	0	872,169	23,267,885	24,213,489
1978	934,119	0	0	0	0	934,119	24,818,739	26,012,786
1979	871,688	0	0	0	0	871,688	23,421,881	24,675,598
1980	1,047,396	4,790	0	30	75	1,052,291	30,105,348	32,038,398
1981	1,037,469	4,790	0	30	75	1,042,364	33,884,524	35,516,366
1982	1,015,555	4,790	0	30	75	1,020,450	39,515,188	41,611,655
1983	1,146,269	4,957	0	30	77	1,151,333	54,543,263	56,802,781
1984	1,427,192	5,051	0	31	78	1,432,352	63,947,633	67,105,188
1985	1,849,827	5,051	0	31	78	1,854,987	69,700,009	73,272,898
1986	1,714,723	5,051	0	31	78	1,719,883	73,437,761	76,707,917
1987	1,689,141	4,324	0	26	67	1,693,558	71,443,424	75,217,576
1988	1,964,428	4,509	0	28	70	1,969,035	72,349,117	76,060,618
1989	1,768,942	4,509	0	28	70	1,773,549	73,894,076	78,662,348
1990	2,274,772	0	0	0	0	2,274,772	86,130,115	91,361,385
1991	2,187,841	0	0	0	0	2,187,841	86,877,284	90,982,870
1992	2,465,364	0	0	0	0	2,465,364	94,167,321	99,235,524
1993	2,811,441	0	0	0	0	2,811,441	100,019,568	107,299,130
1994	3,894,639	0	0	0	0	3,894,639	92,336,811	99,944,106
1995	3,481,049	0	0	0	0	3,481,049	98,887,435	105,659,504
1996	5,144,684	0	0	0	0	5,144,684	105,119,193	112,018,784
1997	2,523,741	(33)	0	0	0	2,523,708	107,647,058	113,385,326
1998	4,302,712	1,878,365	1,386	160,400	88,026	6,430,889	120,649,996	127,316,519
1999	4,235,897	1,957,943	16,646	184,325	87,373	6,482,183	126,770,225	136,051,673
2000	2,879,118	2,533,780	20,786	253,538	109,328	5,796,549	121,867,778	130,506,829
2001	3,114,131	2,233,156	14,426	151,374	57,878	5,570,965	135,955,778	143,308,028
2002	3,175,579	2,686,500	49,511	189,458	81,857	6,182,904	124,890,074	136,503,244
2003	3,338,349	2,780,275	44,211	200,986	85,015	6,448,835	126,274,357	135,200,072
2004	3,542,984	2,673,103	69,895	240,426	109,830	6,636,238	144,682,516	154,786,853
2005	3,846,725	2,979,779	120,379	292,354	137,878	7,377,114	122,684,331	130,785,751
2006	2,526,002	3,233,307	110,280	203,484	112,691	6,185,763	128,379,155	136,383,886
2007	3,212,747	3,005,385	128,889	63,429	56,252	6,466,703	159,658,757	169,425,514
2008	5,607,280	4,307,740	158,215	76,328	60,810	10,210,373	180,927,635	191,628,422
2009	5,173,043	3,737,342	126,090	59,314	47,087	9,142,876	160,703,535	171,126,000
2010	6,500,980	6,454,120	203,619	79,459	66,234	13,304,412	163,661,768	175,681,478
2011	6,197,760	5,815,917	146,747	64,927	52,594	12,277,945	174,124,045	187,104,650
2012	5,422,671	6,562,275	90,737	43,073	37,988	12,156,744	196,066,546	212,065,842
2013	6,314,990	8,882,668	99,814	48,204	39,466	15,385,143	234,580,624	249,657,151
2014	9,550,149	8,211,855	0	0	0	17,762,004	241,626,114	258,218,863
<b>2015</b>	<b>7,304,433</b>	<b>8,108,032</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15,412,465</b>	<b>251,653,697</b>	<b>271,531,259</b>
2016	7,633,772	8,475,349	0	0	0	16,109,121	249,352,608	270,236,427
2017	8,244,413	8,347,730	0	0	0	16,592,143	250,019,581	269,328,804
2018	8,326,857	8,431,207	0	0	0	16,758,064	252,519,777	272,022,092
2019	8,410,126	8,515,519	0	0	0	16,925,645	255,044,980	274,742,318
2020	8,494,227	8,600,674	0	0	0	17,094,901	257,595,427	277,489,739
2021	8,579,169	8,686,681	0	0	0	17,265,850	260,171,382	280,264,637
2022	8,664,961	8,773,548	0	0	0	17,438,509	262,773,096	283,067,282
2023	8,751,610	8,861,283	0	0	0	17,612,893	265,400,825	285,897,952
2024	8,839,126	8,949,896	0	0	0	17,789,022	268,054,833	288,756,932
2025	8,927,518	9,039,395	0	0	0	17,966,913	270,735,380	291,644,502
2026	9,016,793	9,129,789	0	0	0	18,146,582	273,442,735	294,560,947
2027	9,106,961	9,221,087	0	0	0	18,328,048	276,177,164	297,506,557
2028	9,198,030	9,313,298	0	0	0	18,511,328	278,938,937	300,481,626
2029	9,290,011	9,406,431	0	0	0	18,696,442	281,728,322	303,486,438
2030	9,382,911	9,500,495	0	0	0	18,883,406	284,545,608	306,521,303
2031	9,476,740	9,595,500	0	0	0	19,072,240	287,391,066	309,586,519
2032	9,571,507	9,691,455	0	0	0	19,262,962	290,264,974	312,682,381
2033	9,667,222	9,788,370	0	0	0	19,455,592	293,167,624	315,809,207
2034	9,763,895	9,886,253	0	0	0	19,650,148	296,099,301	318,967,298
2035	9,861,534	9,985,116	0	0	0	19,846,650	299,060,295	322,156,972
<b>TOTAL</b>	<b>313,049,987</b>	<b>260,288,406</b>	<b>1,401,631</b>	<b>2,311,373</b>	<b>1,231,049</b>	<b>578,282,446</b>	<b>9,890,352,484</b>	<b>10,605,886,390</b>

(a) Includes certain costs to be assigned directly to Kern County Water Agency. Refer to Appendix B text discussion of Table B-16A under "Project Water Charges."



## Tables B-12 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-12 Variable OMP&R Costs to be Reimbursed through Variable OMP&R Component of Transportation Charge<sup>a</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AQUEDUCT				SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT		
	Reach 1	Reach 3A	Reach 3B	Total	Reach 1	Reach 1	Reach 4	Reach 14A
	Barker Slough Pumping Plant	Cordelia Pumping Plant (Solano)	Cordelia Pumping Plant (Napa) (b)		South Bay & Del Valle Pumping Plants (c)	Banks Pumping Plant	Dos Amigos Pumping Plant	Buena Vista Pumping Plant
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1962	0	0	0	0	36,970	0	0	0
1963	0	0	0	0	57,711	0	0	0
1964	0	0	0	0	74,134	0	0	0
1965	0	0	0	0	142,609	0	0	0
1966	0	0	0	0	192,605	0	0	0
1967	0	0	0	0	223,117	13,881	0	0
1968	0	0	6,989	6,989	336,671	452,630	202,947	0
1969	0	0	8,551	8,551	257,579	293,741	135,425	0
1970	0	0	13,598	13,598	396,358	346,215	211,197	1
1971	0	0	10,609	10,609	381,662	574,015	225,188	115,801
1972	0	0	14,434	14,434	598,702	933,292	502,196	198,914
1973	0	0	14,449	14,449	493,490	688,030	381,232	263,468
1974	0	0	17,473	17,473	565,575	783,562	447,772	315,939
1975	0	0	14,779	14,779	349,758	1,341,019	518,816	508,060
1976	0	0	20,856	20,856	571,361	1,638,453	641,115	712,947
1977	0	0	22,635	22,635	512,996	1,013,307	284,828	267,467
1978	0	0	21,692	21,692	586,355	2,339,502	607,042	689,236
1979	0	0	16,237	16,237	605,136	3,554,256	1,008,564	776,016
1980	0	0	19,945	19,945	523,369	2,083,336	1,129,152	1,051,629
1981	0	0	23,842	23,842	567,692	3,952,931	1,939,189	1,336,867
1982	0	0	12,157	12,157	605,780	3,082,031	1,363,705	1,200,226
1983	0	0	2,342	2,342	82,222	1,001,612	396,086	450,801
1984	0	0	4,822	4,822	271,543	1,856,959	976,773	823,681
1985	0	0	10,188	10,188	451,020	3,186,029	1,621,418	1,409,980
1986	0	0	15,501	15,501	814,111	6,595,625	2,627,407	2,405,224
1987	0	0	27,223	27,223	888,558	5,740,403	2,518,308	2,231,491
1988	17,813	0	24,020	41,833	911,176	6,276,214	2,610,048	2,560,122
1989	29,819	43,846	26,519	100,184	1,163,619	9,847,706	3,953,735	4,042,211
1990	52,210	67,109	40,775	160,094	1,834,626	10,460,533	4,498,260	5,779,750
1991	10,429	10,118	5,252	25,799	420,688	1,882,952	491,071	904,541
1992	13,319	13,070	9,406	35,795	339,021	3,129,419	1,147,502	1,221,282
1993	(11,941)	(8,753)	(5,392)	(26,086)	(150,856)	497,455	326,100	(108,089)
1994	46,791	39,624	29,189	115,604	801,374	5,677,009	2,305,603	2,523,572
1995	20,014	20,620	11,791	52,425	302,558	3,805,713	1,451,578	815,572
1996	57,320	47,288	23,483	128,091	718,807	8,192,821	4,009,531	2,493,264
1997	67,416	52,935	21,955	142,306	1,038,568	6,900,694	2,845,506	2,589,077
1998	(11,427)	(10,141)	(4,879)	(26,447)	(130,734)	185,756	(336,341)	(263,072)
1999	31,419	25,288	11,623	68,330	408,566	6,753,244	2,307,304	1,581,950
2000	72,614	40,414	14,327	127,354	864,185	7,621,716	2,881,170	2,797,632
2001	441,203	250,132	214,039	905,375	4,065,497	23,769,597	9,711,120	14,552,225
2002	234,268	104,564	61,470	400,302	2,324,926	17,025,395	6,894,112	8,423,370
2003	214,102	118,446	97,810	430,357	2,570,189	21,155,445	8,877,641	10,398,364
2004	316,037	138,880	106,974	561,891	2,548,576	21,459,794	9,281,189	12,219,983
2005	347,967	146,837	148,291	643,095	2,817,761	28,116,884	12,374,398	11,432,856
2006	274,604	110,822	143,686	529,111	2,680,206	22,480,747	10,069,517	10,844,436
2007	600,868	223,276	253,867	1,078,010	4,192,529	24,800,952	10,693,597	15,881,499
2008	468,464	183,126	288,324	939,913	3,173,501	16,439,410	5,745,304	10,589,053
2009	285,268	114,019	177,538	576,825	2,740,417	9,924,377	4,491,006	7,578,621
2010	287,994	110,871	214,425	613,290	2,366,846	24,445,718	9,404,394	10,549,772
2011	306,869	114,447	227,640	648,955	3,403,216	35,448,604	15,087,007	14,387,563
2012	311,681	129,591	193,906	635,178	3,607,206	27,899,590	12,203,834	13,992,727
2013	566,437	219,196	338,995	1,124,628	5,692,958	23,835,890	9,002,045	12,956,094
2014	645,063	104,685	425,979	1,175,727	4,845,549	14,580,101	5,208,255	10,215,723
2015	429,766	227,195	410,493	1,067,454	5,517,887	39,373,888	16,945,414	21,074,973
2016	422,225	224,186	403,281	1,049,692	5,855,218	39,386,861	16,908,522	21,076,305
2017	563,913	302,861	635,852	1,502,626	5,992,112	38,947,335	16,416,998	21,626,572
2018	563,913	302,861	635,852	1,502,626	5,992,112	32,071,966	17,440,731	23,489,541
2019	563,901	305,418	638,101	1,507,420	5,708,931	35,268,473	16,570,813	21,272,941
2020	563,901	305,418	638,101	1,507,420	5,708,931	34,990,903	16,924,158	21,911,612
2021	563,901	305,418	638,101	1,507,420	5,708,931	39,498,906	16,844,652	21,778,703
2022	563,901	305,418	638,101	1,507,420	5,708,931	36,648,116	16,945,918	21,974,013
2023	563,901	305,418	638,101	1,507,420	5,708,931	39,231,874	17,057,722	22,188,055
2024	563,901	305,418	638,101	1,507,420	5,708,931	34,416,092	16,841,621	21,808,355
2025	563,901	305,418	638,101	1,507,420	5,708,931	34,098,431	17,011,406	22,126,712
2026	563,901	305,418	638,101	1,507,420	5,708,931	34,514,998	16,749,433	21,659,942
2027	563,901	305,418	638,101	1,507,420	5,708,931	29,487,979	17,050,179	22,212,158
2028	563,901	305,418	638,101	1,507,420	5,708,931	40,254,239	16,833,626	21,826,353
2029	563,901	305,418	638,101	1,507,420	5,708,931	40,882,605	16,986,423	22,112,391
2030	563,901	305,418	638,101	1,507,420	5,708,931	28,869,055	16,774,032	21,736,569
2031	563,901	305,418	638,101	1,507,420	5,708,931	36,218,110	17,650,500	23,357,918
2032	563,901	305,418	638,101	1,507,420	5,708,931	29,901,082	16,338,202	20,983,312
2033	563,901	305,418	638,101	1,507,420	5,708,931	45,011,062	17,628,127	23,337,616
2034	563,901	305,418	638,101	1,507,420	5,708,931	32,474,916	16,443,536	21,191,046
2035	563,901	305,418	638,101	1,507,420	5,708,931	59,285,991	18,866,385	25,746,015
<b>TOTAL</b>	<b>17,262,755</b>	<b>8,659,517</b>	<b>16,332,528</b>	<b>42,254,800</b>	<b>186,547,215</b>	<b>1,204,917,444</b>	<b>532,502,242</b>	<b>670,208,949</b>

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."  
 (b) Costs for the period 1968 through 1987 are for an interim facility.  
 (c) The relatively minor costs of Del Valle Pumping Plant have been combined with those of South Bay Pumping Plant to simplify the allocation procedures.

**TABLE B-12 Variable OMP&R Costs to be Reimbursed through  
Variable OMP&R Component of Transportation Charge<sup>a</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						
	Reach 15A Wheeler Ridge Pumping Plant	Reach 16A Chrisman Pumping Plant	Reach 17E Edmonston Pumping Plant	Reach 18A Alamo Powerplant	Reach 22B Pearblossom Pumping Plant	Reach 23 Mojave Siphon Powerplant	Reach 24 Silverwood Lake (d)
	[9]	[10]	[11]	[12]	[13]	[14]	[15]
1962	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0
1971	2,564	0	0	0	0	0	0
1972	68,304	142,902	542,625	0	3,468	0	0
1973	236,623	387,198	1,548,428	0	202,289	0	0
1974	324,966	564,464	2,164,223	0	324,993	0	0
1975	552,952	1,095,331	4,010,395	0	575,061	0	0
1976	713,875	1,506,985	5,443,936	0	889,544	0	0
1977	303,107	657,108	2,360,624	0	315,128	0	0
1978	616,104	1,132,296	4,180,131	0	1,508,115	0	0
1979	749,188	1,526,850	5,475,688	0	1,838,687	0	0
1980	1,047,495	2,102,439	7,028,235	0	1,762,063	0	0
1981	1,319,739	2,838,773	9,351,931	0	2,296,771	0	0
1982	1,213,660	2,424,920	8,352,207	0	1,498,620	0	0
1983	432,165	793,915	2,375,225	0	397,766	0	0
1984	770,618	1,479,784	4,585,198	0	624,213	0	0
1985	1,411,621	2,812,461	9,365,591	0	1,226,515	0	0
1986	2,432,322	4,999,949	16,956,023	(1,013,756)	2,359,599	0	0
1987	2,213,047	4,434,510	14,612,448	(1,017,868)	1,814,728	0	243,983
1988	2,557,952	5,120,998	16,801,811	(742,800)	2,370,395	0	37,927
1989	4,061,396	8,559,270	28,732,499	(788,139)	4,228,697	0	50,884
1990	6,013,924	13,616,111	48,319,508	(832,947)	6,490,357	0	187,259
1991	1,032,050	2,427,880	8,647,065	(269,625)	996,352	0	0
1992	1,274,895	2,560,253	8,575,989	(916,154)	1,142,454	0	317,172
1993	(86,676)	(490,235)	(2,223,221)	(55,346)	(245,059)	0	(79,954)
1994	2,537,943	5,323,430	18,470,003	(59,356)	2,605,813	0	0
1995	725,389	1,435,098	4,738,967	(1,187,312)	972,086	0	777,343
1996	2,299,388	4,875,010	17,027,386	(2,788,262)	2,647,473	(914,092)	1,053,254
1997	2,417,154	5,424,334	19,413,834	(2,488,338)	3,037,087	(1,680,469)	0
1998	(236,322)	(524,933)	(1,809,182)	(1,969,187)	(431,135)	(1,217,950)	(149,186)
1999	1,288,328	3,316,481	12,854,526	(2,851,993)	1,861,548	(2,533,429)	71,918
2000	2,864,458	6,591,623	23,781,921	(5,070,499)	3,719,175	(4,371,978)	0
2001	14,906,925	33,563,884	123,983,040	(3,276,174)	18,888,282	(3,621,886)	929,424
2002	8,731,681	19,721,183	72,470,283	(4,919,131)	10,667,925	(5,247,076)	95,264
2003	10,819,647	24,646,995	90,690,783	(3,362,477)	14,531,277	(6,610,346)	232,125
2004	12,829,748	29,292,672	107,692,928	(6,248,061)	16,949,136	(7,691,613)	0
2005	11,693,005	26,503,870	94,317,312	(5,791,742)	17,473,742	(6,359,950)	0
2006	11,012,925	25,100,320	84,425,736	(4,019,245)	16,345,933	(6,342,354)	0
2007	16,403,750	37,088,407	127,077,809	(2,976,651)	19,650,235	(5,872,118)	0
2008	11,638,471	23,475,494	81,278,636	(3,305,736)	11,111,722	(3,203,162)	322,444
2009	8,034,033	17,434,996	66,241,269	(3,096,612)	8,493,841	(2,225,065)	2,011
2010	10,717,440	24,197,056	88,472,102	(4,904,985)	16,603,018	(5,529,305)	0
2011	14,427,939	32,369,358	113,472,660	(6,340,454)	23,054,263	(7,675,700)	494,540
2012	14,015,729	31,846,886	111,768,539	(2,424,628)	17,657,573	(8,836,129)	0
2013	13,190,281	29,815,481	104,990,757	(1,989,599)	12,654,290	(4,750,469)	0
2014	10,438,133	24,088,602	87,523,817	(2,571,141)	10,035,618	(3,099,375)	0
2015	<b>21,584,392</b>	<b>49,215,664</b>	<b>176,884,869</b>	<b>(7,738,539)</b>	<b>28,818,606</b>	<b>(10,534,873)</b>	<b>0</b>
2016	21,585,740	49,221,395	176,921,828	(7,722,149)	28,827,196	(10,478,264)	0
2017	22,042,711	50,178,214	184,191,329	(7,079,114)	25,492,372	(9,185,441)	0
2018	24,064,351	54,866,311	201,640,300	(7,783,887)	28,434,475	(10,282,161)	0
2019	21,936,505	49,965,207	183,247,084	(7,723,466)	28,429,218	(10,229,370)	0
2020	22,628,269	51,568,128	189,209,051	(7,985,596)	29,575,561	(10,663,983)	0
2021	22,484,152	51,234,073	187,966,107	(7,983,213)	29,498,120	(10,634,452)	0
2022	22,695,958	51,725,089	189,793,042	(8,002,226)	29,577,025	(10,664,542)	0
2023	22,928,270	52,263,809	191,797,984	(8,116,503)	30,104,105	(10,865,782)	0
2024	22,516,315	51,308,690	188,243,638	(7,804,319)	28,759,575	(10,353,257)	0
2025	22,861,645	52,109,311	191,222,786	(8,069,734)	29,857,746	(10,771,670)	0
2026	22,355,517	50,936,088	186,857,591	(7,853,014)	29,027,060	(10,455,006)	0
2027	22,954,394	52,324,416	192,023,325	(8,025,101)	29,672,901	(10,701,117)	0
2028	22,535,843	51,354,018	188,412,214	(7,941,132)	29,325,085	(10,568,497)	0
2029	22,846,075	52,073,233	191,088,347	(7,968,787)	29,490,906	(10,631,701)	0
2030	22,438,566	51,128,615	187,573,714	(7,904,849)	29,175,494	(10,511,515)	0
2031	24,201,515	55,219,368	202,806,728	(8,235,288)	30,548,125	(11,035,632)	0
2032	21,624,009	49,242,304	180,561,019	(7,615,491)	28,048,939	(10,083,452)	0
2033	24,179,209	55,167,455	202,612,742	(8,296,391)	30,803,615	(11,133,498)	0
2034	21,848,460	49,761,961	182,492,366	(7,748,333)	28,530,632	(10,266,253)	0
2035	26,821,118	61,317,383	225,574,766	(8,383,878)	31,224,961	(11,295,110)	0
TOTAL	689,150,951	1,558,461,142	5,657,210,518	(243,259,228)	874,371,376	(309,128,042)	4,586,408

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."  
 (d) These values represent a proportionate allocation of the total variable OMP&R costs of pumping and recovery plants (Table B-3) associated with net annual withdrawals from storage for Project Transportation Facilities. The allocation is determined annually by applying the following ratio, calculated from the data shown in Table B-6: "Reservoir Storage Changes" (withdrawals, as a positive value) conveyed through each plant, divided by "Total" annual quantity conveyed through each plant, in acre-feet. The costs so determined are accumulated for all upstream plants for each year, for each respective reservoir.

**TABLE B-12 Variable OMP&R Costs to be Reimbursed through Variable OMP&R Component of Transportation Charge<sup>a</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 26A	EBX Reach 2B	EBX Reach 3A	EBX Reach 4B	Reach 28J	Reach 29A	Reach 29G	
	Devil Canyon Powerplant [16]	Greenspot Pumping Plant [17]	Crafton Hills Pumping Plant [18]	Cherry Valley Pumping Plant [19]	Lake Perris (d) [20]	Oso Pumping Plant [21]	Warne Powerplant [22]	
1962	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	
1968	0	0	0	0	0	0	0	
1969	0	0	0	0	0	0	0	
1970	0	0	0	0	0	0	0	
1971	0	0	0	0	0	0	0	
1972	(3,024)	0	0	0	0	79,315	0	
1973	(461,268)	0	0	0	0	122,787	0	
1974	(546,156)	0	0	0	0	157,511	0	
1975	(1,095,523)	0	0	0	0	314,636	0	
1976	(1,566,056)	0	0	0	0	326,967	0	
1977	(1,222,866)	0	0	0	0	75,335	0	
1978	(3,085,094)	0	0	0	0	89,383	0	
1979	(3,466,481)	0	0	0	0	102,584	0	
1980	(3,318,152)	0	0	0	0	236,768	0	
1981	(3,842,971)	0	0	0	0	444,280	0	
1982	(2,736,072)	0	0	0	0	539,245	(783,626)	
1983	(5,478,830)	0	0	0	0	214,069	(1,488,439)	
1984	(7,350,989)	0	0	0	0	484,239	(4,088,209)	
1985	(10,748,103)	0	0	0	0	874,069	(5,930,176)	
1986	(11,484,996)	0	0	0	0	1,269,590	(5,579,301)	
1987	(10,814,483)	0	0	0	53,242	1,323,472	(6,292,822)	
1988	(14,495,967)	0	0	0	0	1,421,372	(6,994,588)	
1989	(18,688,631)	0	0	0	0	2,046,005	(8,368,716)	
1990	(20,911,839)	0	0	0	147,163	2,857,442	(11,011,193)	
1991	(4,884,013)	0	0	0	0	535,456	(3,604,791)	
1992	(9,513,281)	0	0	0	(61,233)	686,984	(5,272,726)	
1993	(7,502,549)	0	0	0	0	51,327	(3,380,473)	
1994	(11,815,745)	0	0	0	80,824	1,210,469	(5,835,219)	
1995	(9,742,248)	0	0	0	0	151,109	(1,179,155)	
1996	(12,358,465)	0	0	0	0	895,929	(4,248,531)	
1997	(13,293,791)	0	0	0	111,776	897,657	(4,797,589)	
1998	(10,108,555)	0	0	0	0	(27,767)	(746,113)	
1999	(14,952,833)	0	0	0	(44,587)	655,690	(5,341,364)	
2000	(25,522,757)	0	0	0	(125,537)	1,154,161	(9,464,490)	
2001	(19,510,278)	0	0	0	0	6,139,290	(7,614,510)	
2002	(24,676,763)	0	0	0	0	3,806,290	(10,286,903)	
2003	(27,490,216)	0	0	0	1,150,417	4,339,466	(9,899,070)	
2004	(31,246,167)	78,351	68,735	7,271	0	5,393,913	(11,835,098)	
2005	(28,682,474)	69,550	48,964	2,568	5,125,447	3,413,375	(6,683,632)	
2006	(34,389,659)	139,168	152,477	18,724	0	2,619,701	(6,870,988)	
2007	(28,529,045)	270,007	265,495	14,439	591,012	6,266,462	(9,522,236)	
2008	(16,403,544)	271,495	347,089	10,854	0	4,617,331	(7,184,125)	
2009	(13,474,182)	352,008	370,086	9,783	406,044	4,040,385	(6,578,745)	
2010	(24,427,811)	330,097	435,098	22,485	0	3,271,697	(5,697,650)	
2011	(31,980,782)	389,197	504,647	36,135	0	3,274,317	(5,505,320)	
2012	(23,571,258)	480,981	570,016	54,199	238,013	5,294,662	(8,230,796)	
2013	(14,097,814)	513,831	601,249	71,350	0	6,762,464	(8,740,718)	
2014	(7,028,870)	554,180	691,611	82,382	0	5,931,626	(5,353,205)	
<b>2015</b>	<b>(24,159,877)</b>	<b>457,515</b>	<b>570,974</b>	<b>75,040</b>	<b>0</b>	<b>7,878,653</b>	<b>(8,185,842)</b>	
2016	(24,019,191)	459,074	572,920	107,371	0	7,845,604	(8,138,229)	
2017	(21,682,085)	502,519	627,139	125,251	0	9,537,781	(9,062,538)	
2018	(22,582,821)	502,519	627,139	129,236	0	10,376,624	(9,861,751)	
2019	(23,766,982)	502,519	627,139	120,769	0	7,970,353	(8,046,603)	
2020	(24,810,846)	502,519	627,139	120,769	0	8,186,415	(8,239,188)	
2021	(24,291,259)	502,519	627,139	120,769	0	8,076,291	(8,126,882)	
2022	(23,873,406)	502,519	627,139	120,769	0	8,253,670	(8,332,642)	
2023	(24,535,037)	502,519	627,139	120,769	0	8,269,691	(8,346,832)	
2024	(24,259,322)	502,519	627,139	120,769	0	8,422,763	(8,503,937)	
2025	(24,142,006)	502,519	627,139	120,769	0	8,304,095	(8,353,781)	
2026	(24,394,945)	502,519	627,139	120,769	0	8,142,506	(8,192,139)	
2027	(24,257,132)	502,519	627,139	120,769	0	8,474,585	(8,527,097)	
2028	(24,441,453)	502,519	627,139	120,769	0	8,199,328	(8,274,886)	
2029	(24,192,328)	502,519	627,139	120,769	0	8,441,812	(8,520,954)	
2030	(24,270,579)	502,519	627,139	120,769	0	8,164,730	(8,240,116)	
2031	(24,339,155)	502,519	627,139	120,769	0	9,407,015	(9,464,642)	
2032	(23,727,594)	502,519	627,139	120,769	0	7,823,842	(7,868,959)	
2033	(25,005,306)	502,519	627,139	120,769	0	9,257,731	(9,345,879)	
2034	(23,646,811)	502,519	627,139	120,769	0	7,850,547	(7,899,949)	
2035	(25,263,379)	502,519	627,139	120,769	0	12,472,176	(12,574,893)	
<b>TOTAL</b>	<b>(1,072,182,115)</b>	<b>13,913,317</b>	<b>17,115,003</b>	<b>2,820,161</b>	<b>7,672,580</b>	<b>265,717,275</b>	<b>(386,518,256)</b>	

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."  
 (d) These values represent a proportionate allocation of the total variable OMP&R costs of pumping and recovery plants (Table B-3) associated with net annual withdrawals from storage for Project Transportation Facilities. The allocation is determined annually by applying the following ratio, calculated from the data shown in Table B-6: "Reservoir Storage Changes" (withdrawals, as a positive value) conveyed through each plant, divided by "Total" annual quantity conveyed through each plant, in acre-feet. The costs so determined are accumulated for all upstream plants for each year, for each respective reservoir.

**TABLE B-12 Variable OMP&R Costs to be Reimbursed through Variable OMP&R Component of Transportation Charge<sup>a</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)						GRAND TOTAL
	Reach 29H	Reach 29J	Reach 30	Reach 31A	Reach 33A	Total	
	Pyramid Lake (d)	Castaic Powerplant	Castaic Lake (d)	Las Perillas & Badger Hill Pumping Plants	Devil's Den, Bluestone & Polonio Pumping Plants		
[23]	[24]	[25]	[26]	[27]	[28]	[29]	
1962	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	192,605
1967	0	0	0	0	0	13,881	236,998
1968	0	0	0	118,676	0	774,253	1,117,913
1969	0	0	0	78,350	0	507,516	773,646
1970	0	0	0	136,429	0	693,842	1,103,798
1971	0	0	0	166,296	0	1,083,864	1,476,135
1972	0	(211,144)	0	237,638	0	2,494,486	3,107,622
1973	0	(1,057,564)	0	120,913	0	2,432,136	2,940,075
1974	0	(1,547,884)	0	118,582	0	3,107,972	3,691,020
1975	0	(2,455,461)	0	94,848	0	5,460,134	5,824,671
1976	0	(2,827,557)	0	141,260	0	7,621,469	8,213,686
1977	0	(3,734,462)	0	71,311	0	390,887	926,518
1978	0	(1,542,479)	0	179,925	0	6,714,161	7,322,208
1979	0	(2,773,323)	0	192,126	0	8,984,155	9,605,528
1980	0	(3,408,863)	0	168,458	0	9,882,560	10,425,874
1981	0	(2,834,322)	0	169,177	0	16,972,365	17,563,899
1982	0	(3,463,971)	0	168,390	0	12,859,335	13,477,272
1983	0	(6,649,626)	0	17,920	0	(7,537,336)	(7,452,772)
1984	0	(4,710,802)	0	112,679	0	(4,435,856)	(4,159,491)
1985	0	(15,698,638)	0	146,843	0	(10,322,390)	(9,861,182)
1986	0	(11,072,448)	0	297,886	0	10,793,124	11,622,736
1987	80,822	(11,557,616)	(43,085)	245,082	0	5,785,662	6,701,444
1988	54,038	(12,295,001)	(210,845)	214,519	0	5,286,197	6,239,206
1989	84,370	(14,812,039)	89,852	282,180	0	23,321,280	24,585,082
1990	0	(20,116,741)	245,034	416,832	0	46,159,454	48,154,174
1991	432,382	(6,579,194)	0	3,610	0	2,015,735	2,462,222
1992	29,879	(9,167,653)	(1,141,229)	101,665	0	(5,884,783)	(5,509,967)
1993	(675,438)	(7,895,978)	(2,751,590)	(111,306)	0	(24,731,032)	(24,907,974)
1994	0	(10,565,940)	(81,262)	206,086	0	12,583,232	13,500,210
1995	544,099	(4,049,615)	0	243,434	0	(497,940)	(142,957)
1996	0	(8,457,232)	0	296,170	0	15,023,644	15,870,542
1997	0	(8,727,328)	(897)	298,483	208,816	13,156,005	14,336,879
1998	(965,988)	(3,360,851)	(2,139,549)	(55,491)	(92,902)	(24,248,768)	(24,405,949)
1999	0	(9,672,802)	0	160,203	228,670	(4,317,144)	(3,840,249)
2000	0	(17,958,033)	0	219,325	361,521	(10,520,593)	(9,529,053)
2001	999,629	(13,495,346)	2,413,037	1,082,131	2,162,821	205,583,212	210,554,084
2002	0	(18,455,025)	0	544,053	1,351,161	86,145,817	88,871,046
2003	833,695	(16,903,355)	964,514	637,237	1,525,933	126,538,075	129,538,621
2004	221,340	(21,110,644)	682,258	670,805	1,774,635	140,491,177	143,601,644
2005	4,739,141	(12,763,664)	4,527,400	840,691	1,703,422	162,101,163	165,562,019
2006	531,139	(11,822,176)	6,106,188	819,111	1,376,878	128,598,576	131,807,893
2007	0	(19,017,327)	0	1,284,958	2,278,744	196,649,987	201,920,526
2008	0	(14,961,833)	1,326,040	1,066,593	1,644,428	124,825,966	128,939,380
2009	402,825	(16,146,570)	0	764,606	1,329,373	88,354,088	91,671,330
2010	0	(10,738,810)	0	897,391	1,477,211	139,524,917	142,505,054
2011	0	(11,102,175)	1,984,429	1,105,042	2,120,879	195,552,151	199,604,323
2012	190,984	(15,133,885)	0	1,023,580	2,049,975	181,090,594	185,332,978
2013	81,696	(15,520,329)	495,562	1,441,573	2,152,042	173,465,676	180,283,261
2014	0	(8,955,797)	0	139,450	171,510	142,653,621	148,674,897
2015	0	<b>(13,782,709)</b>	0	<b>1,587,095</b>	<b>4,879,239</b>	<b>304,944,482</b>	<b>311,529,823</b>
2016	0	(13,685,793)	0	1,577,964	4,864,218	305,311,372	312,216,282
2017	0	(15,459,361)	0	818,859	5,360,220	313,398,761	320,893,499
2018	0	(16,846,284)	0	818,859	5,360,220	332,465,368	339,960,106
2019	0	(12,933,904)	0	808,917	5,201,927	309,221,540	316,437,891
2020	0	(13,292,329)	0	808,917	5,201,927	317,263,426	324,479,777
2021	0	(13,108,947)	0	808,917	5,201,927	320,497,522	327,713,873
2022	0	(13,402,833)	0	808,917	5,201,926	320,598,452	327,814,803
2023	0	(13,428,874)	0	808,917	5,201,926	325,809,752	333,026,103
2024	0	(13,682,571)	0	808,917	5,201,927	314,974,914	322,191,265
2025	0	(13,484,808)	0	808,917	5,201,927	320,031,404	327,247,755
2026	0	(13,216,195)	0	808,917	5,201,927	313,393,107	320,609,458
2027	0	(13,767,300)	0	808,917	5,201,927	316,183,461	323,399,812
2028	0	(13,309,749)	0	808,917	5,201,926	321,466,259	328,682,610
2029	0	(13,711,945)	0	808,917	5,201,926	326,157,347	333,373,698
2030	0	(13,251,458)	0	808,917	5,201,927	308,943,529	316,159,880
2031	0	(15,318,639)	0	808,917	5,201,927	338,277,194	345,493,545
2032	0	(12,685,410)	0	808,917	5,201,927	299,803,074	307,019,425
2033	0	(15,067,960)	0	808,917	5,201,926	346,409,793	353,626,144
2034	0	(12,728,677)	0	808,917	5,201,926	305,564,711	312,781,062
2035	0	(20,474,941)	0	808,917	5,201,926	390,577,864	397,794,215
<b>TOTAL</b>	<b>7,584,614</b>	<b>(711,972,190)</b>	<b>12,465,859</b>	<b>36,130,086</b>	<b>132,721,765</b>	<b>8,964,489,860</b>	<b>9,193,291,875</b>

(a) Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."

(d) These values represent a proportionate allocation of the total variable OMP&R costs of pumping and recovery plants (Table B-3) associated with net annual withdrawals from storage for Project Transportation Facilities. The allocation is determined annually by applying the following ratio, calculated from the data shown in Table B-6: "Reservoir Storage Changes" (withdrawals, as a positive value) conveyed through each plant, divided by "Total" annual quantity conveyed through each plant, in acre-feet. The costs so determined are accumulated for all upstream plants for each year, for each respective reservoir.



**TABLE B-13 Capital and Operating Costs of Project Conservation Facilities to be Reimbursed through Delta Water Charge**

(in dollars)

Calendar Year	Initial Project Conservation Facilities (Portions of Upper Feather Lakes, Oroville-Thermalito and California Aqueduct Facilities)					Planning and Pre-operating Costs (a,f)	Total
	Capital Costs (a)	Capital Cost Credits (b)	Operating Costs (c)	Application of Oroville Power Revenues to:			
				Capital Costs (d)	Operating Costs (e)		
[1]	[2]	[3]	[4]	[5]	[6]	[7]	
1952	171,322	0	0	0	0	0	171,322
1953	312,190	0	0	0	0	0	312,190
1954	308,624	0	0	0	0	0	308,624
1955	194,645	0	0	0	0	0	194,645
1956	1,357,077	0	0	0	0	0	1,357,077
1957	6,210,709	0	0	0	0	0	6,210,709
1958	9,510,916	0	0	0	0	0	9,510,916
1959	11,390,586	0	0	0	0	0	11,390,586
1960	14,463,274	(4,850,000)	0	0	0	0	9,613,274
1961	18,729,965	(431,527)	0	0	0	0	18,298,438
1962	9,099,967	(479,280)	0	0	0	0	8,620,687
1963	73,098,107	(478,743)	(14,000)	0	0	0	72,605,364
1964	62,629,003	(751,330)	(14,000)	0	0	107,780	61,971,453
1965	71,048,877	(763,541)	(14,000)	0	0	551,850	70,823,186
1966	125,376,541	(748,649)	(14,000)	0	0	1,081,023	125,694,915
1967	94,481,603	(812,145)	(13,446)	0	0	1,189,212	94,845,224
1968	39,986,145	(431,574)	1,303,821	(951,000)	0	793,399	40,700,791
1969	5,367,865	(259,015)	2,890,772	(11,007,000)	0	601,867	(2,405,511)
1970	4,208,411	(203,733)	4,818,634	(14,650,000)	(1,500,000)	516,659	(6,810,029)
1971	3,956,703	(193,631)	6,026,480	(14,650,000)	(1,500,000)	408,754	(5,951,694)
1972	4,662,255	(196,361)	5,393,011	(14,650,000)	(1,500,000)	287,374	(6,003,721)
1973	4,090,078	(136,997)	6,135,774	(14,650,000)	(1,500,000)	203,384	(5,857,761)
1974	6,852,718	(137,503)	6,944,723	(17,950,000)	(1,500,000)	201,907	(5,588,155)
1975	8,343,833	(234,567)	7,697,390	(14,650,000)	(1,500,000)	146,188	(197,156)
1976	6,189,618	(204,944)	7,067,037	(14,650,000)	(1,500,000)	205,234	(2,893,055)
1977	21,554,452	(150,214)	10,547,977	(14,650,000)	(1,500,000)	857,419	16,659,634
1978	8,031,393	(64,566)	12,851,158	(14,650,000)	(1,500,000)	2,131,286	6,799,271
1979	9,751,861	0	9,547,014	(14,650,000)	(1,500,000)	2,131,884	5,280,759
1980	11,345,574	0	13,258,298	(14,650,000)	(1,500,000)	3,638,851	12,092,723
1981	11,921,267	0	10,326,538	(14,650,000)	(1,500,000)	4,597,474	10,695,279
1982	17,479,059	0	16,154,872	(14,650,000)	(1,500,000)	4,594,682	22,078,613
1983	12,763,378	0	22,251,331	(34,705,000)	(8,735,000)	3,751,993	(4,673,298)
1984	9,367,268	0	22,700,224	(14,650,000)	(10,348,000)	2,979,126	10,048,618
1985	12,538,173	0	23,462,283	(14,650,000)	(8,198,000)	2,069,024	15,221,480
1986	21,586,488	0	26,479,379	(14,650,000)	(9,107,000)	1,602,419	25,911,286
1987	32,734,633	0	23,479,839	(14,650,000)	(9,451,000)	1,762,179	33,875,651
1988	33,028,679	0	25,832,491	(14,650,000)	(8,677,000)	1,808,899	37,343,069
1989	11,075,132	0	28,442,946	(14,650,000)	(8,102,000)	2,676,007	19,444,085
1990	28,764,328	0	37,430,776	(14,650,000)	(8,498,000)	1,436,712	44,483,816
1991	37,462,303	0	76,586,450	(14,650,000)	(9,487,000)	1,727,664	91,639,417
1992	29,169,134	0	32,280,229	(14,650,000)	(8,526,000)	1,707,822	39,981,185
1993	22,366,873	0	36,884,103	(14,650,000)	(8,768,000)	1,708,490	37,541,465
1994	14,709,626	0	41,193,693	(14,650,000)	(7,484,000)	2,134,392	35,903,711
1995	15,120,856	0	46,162,374	(14,650,000)	(4,976,939)	2,042,481	43,698,773
1996	10,993,080	0	50,885,567	(14,650,000)	(5,503,289)	2,448,692	44,174,050
1997	15,267,994	0	51,798,497	(14,650,000)	(5,740,515)	1,699,730	48,365,706
1998	3,854,173	0	54,728,293	(14,650,000)	(8,155,000)	1,193,198	36,966,664
1999	7,473,065	0	56,216,447	(14,650,000)	(9,198,000)	9,686	39,851,198
2000	10,099,709	0	56,304,221	(14,688,338)	(10,297,482)	13,491	41,431,602
2001	10,290,622	0	76,237,844	(16,223,803)	(14,328,482)	23,866	56,000,047
2002	19,500,201	0	68,303,125	(19,498,891)	(20,826,560)	24,426	47,502,301
2003	22,829,817	0	77,917,430	(20,605,664)	(29,982,088)	9,833	50,169,328
2004	20,899,549	0	91,250,162	(17,530,688)	(35,845,422)	7,548	58,781,149
2005	5,905,937	0	104,058,996	(15,354,462)	(22,004,805)	0	72,605,667
2006	10,832,536	0	102,138,986	(15,210,585)	(21,005,765)	0	76,755,172
2007	7,704,768	0	87,535,610	(14,734,855)	(16,759,447)	0	63,746,076
2008	6,113,795	0	104,526,831	(14,749,241)	(19,295,181)	0	76,596,204
2009	5,100,494	0	117,055,965	(15,938,585)	(20,877,805)	0	85,340,070
2010	4,381,817	0	120,734,742	(15,984,649)	(20,222,025)	0	88,909,885
2011	8,861,501	0	126,569,359	(15,984,588)	(19,207,013)	0	100,239,280
2012	17,803,657	0	131,472,564	(16,058,191)	(25,150,420)	0	108,067,610
2013	75,862,180	0	151,681,150	(16,060,171)	(31,558,249)	0	179,924,910
2014	80,966,669	0	157,966,099	(16,061,444)	(26,173,221)	0	196,698,103
2015	67,753,893	0	163,630,591	(16,066,110)	(27,351,016)	0	187,967,358
2016	26,497,347	0	165,073,217	(16,064,155)	(28,581,812)	0	146,924,597
2017	18,141,730	0	164,103,693	(16,063,518)	(27,642,370)	0	138,539,535
2018	14,890,295	0	144,645,793	(16,061,774)	(27,918,793)	0	115,555,521
2019	14,890,295	0	155,086,890	(16,060,769)	(28,197,981)	0	125,718,435
2020	13,441,295	0	153,827,707	(16,064,369)	(28,479,961)	0	122,724,672
2021	12,475,295	0	160,028,732	(16,067,795)	(28,764,761)	0	127,671,471
2022	11,509,295	0	146,865,116	(16,065,703)	(29,052,408)	0	113,256,300
2023	10,060,295	0	151,854,679	(16,068,793)	(29,342,932)	0	116,509,249
2024	400,295	0	147,806,657	(16,061,606)	(29,636,362)	0	102,508,984
2025	400,295	0	145,482,674	(16,069,224)	(29,932,725)	0	99,881,020
2026	400,295	0	154,375,580	(16,062,190)	(30,232,053)	0	108,481,632
2027	400,295	0	149,408,261	(16,059,803)	(30,534,373)	0	103,214,380
2028	400,295	0	159,298,057	(16,067,240)	(30,839,717)	0	112,791,395
2029	400,295	0	157,764,725	(16,064,668)	(31,148,114)	0	110,952,238
2030	400,295	0	152,064,667	(14,731,995)	(31,459,595)	0	106,273,372
2031	400,295	0	156,598,226	(14,733,966)	(31,774,191)	0	110,490,364
2032	400,295	0	158,849,327	(14,730,617)	(32,091,933)	0	112,427,072
2033	400,295	0	165,500,086	(14,732,267)	(32,412,852)	0	118,755,262
2034	400,295	0	162,913,461	(14,733,652)	(32,736,981)	0	115,843,123
2035	400,295	0	167,934,193	(14,729,780)	(33,064,351)	0	120,540,357
TOTAL	1,482,016,353	(11,528,320)	5,634,562,393	(1,048,857,130)	(1,123,183,988)	57,085,905	4,990,095,212

(a) Reimbursed through the capital cost component of the Delta Water Charge.  
 (b) Negotiated settlements as to the magnitude of SWP planning costs from 1952 through 1978.  
 (c) Reimbursed through the minimum OMP&R component of the Delta Water Charge. Credits for Gianelli power generation are reflected in these net costs.  
 (d) Revenues credited through the capital cost component of the Delta Water Charge.  
 (e) Revenues credited through the minimum OMP&R component of the Delta Water Charge.  
 (f) Under amendments of Articles 22(e) and 22(g), planning and pre-operating costs of additional Project Conservation Facilities incurred through 2013 reflected in the Delta Water Charge.

## Tables B-14 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA (a)	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1952	0	0	0	83	114	410	608	122	224	346
1953	0	0	0	323	479	1,808	2,610	336	620	956
1954	0	0	0	819	1,306	5,150	7,275	421	777	1,199
1955	0	0	0	977	1,570	6,297	8,844	211	390	601
1956	0	0	0	8,844	14,459	63,816	87,120	227	418	645
1957	15,199	11,436	26,634	21,564	35,240	649,596	706,401	291	536	827
1958	33,420	16,591	50,011	67,764	71,717	733,414	872,896	720	1,328	2,048
1959	20,697	6,591	27,288	154,255	143,730	493,050	791,035	10,636	69,139	79,775
1960	9,097	8,830	17,927	296,492	275,610	1,018,661	1,590,763	15,255	99,794	115,048
1961	6,950	7,445	14,395	853,506	802,675	1,914,709	3,570,890	10,163	36,681	46,843
1962	(194)	(926)	(1,120)	545,123	615,141	1,686,041	2,846,306	17,281	39,570	56,851
1963	1,319	1,111	2,430	657,426	1,281,271	3,243,838	5,182,534	68,821	140,841	209,662
1964	38,393	35,466	73,859	712,650	1,747,783	7,251,800	9,712,233	138,614	282,003	420,617
1965	198,833	62,221	261,054	360,779	606,025	3,414,457	4,381,262	250,706	497,152	747,859
1966	461,619	49,917	511,536	592,714	592,598	2,245,215	3,430,528	587,951	1,117,486	1,705,437
1967	1,569,498	40,379	1,609,877	796,995	803,951	2,401,862	4,002,808	936,412	1,762,694	2,699,106
1968	859,613	61,691	921,304	736,470	696,075	1,997,924	3,430,469	351,131	675,220	1,026,351
1969	74,388	59,318	133,706	269,698	293,275	764,950	1,327,923	76,966	164,583	241,550
1970	43,361	67,877	111,238	58,676	61,200	135,569	255,445	47,891	109,224	157,115
1971	26,763	34,052	60,815	12,086	18,227	84,089	114,402	28,638	80,715	109,353
1972	19,643	18,905	38,548	12,293	12,763	63,610	88,666	19,289	50,230	69,519
1973	56,510	30,874	87,384	10,494	12,136	39,380	62,010	23,010	56,178	79,189
1974	165,830	65,832	231,662	15,722	24,402	73,119	113,243	25,037	61,383	86,420
1975	91,824	89,234	181,058	16,730	15,806	41,394	73,930	14,740	61,416	76,156
1976	57,765	83,651	141,416	34,004	34,663	109,610	178,277	33,638	130,440	164,078
1977	64,167	80,147	144,314	46,229	45,115	133,375	224,720	108,324	264,720	373,044
1978	69,319	81,717	151,036	71,234	66,008	174,898	312,140	21,415	103,822	125,237
1979	191,273	282,907	474,180	45,468	42,943	110,665	199,077	22,941	125,669	148,610
1980	264,433	386,006	650,439	134,522	124,352	304,614	563,488	103,258	462,895	566,153
1981	227,606	383,086	610,692	(33,738)	(29,856)	(65,637)	(129,231)	(15,416)	(135,240)	(150,656)
1982	549,164	870,611	1,419,775	7,876	8,321	27,065	43,262	4,102	(58,882)	(54,780)
1983	1,254,900	1,433,061	2,687,961	138,413	131,515	339,246	609,175	32,196	110,287	142,483
1984	2,547,878	2,750,040	5,297,918	152,992	140,971	351,921	645,884	35,448	107,723	143,171
1985	7,143,123	6,443,613	13,586,736	19,776	19,245	53,491	92,512	17,424	78,896	96,319
1986	10,565,937	16,926,630	27,492,567	32,034	31,581	88,070	151,684	44,135	306,452	350,588
1987	7,979,832	12,599,507	20,579,339	50,153	48,675	138,959	237,787	126,995	1,342,116	1,469,110
1988	2,312,909	4,343,513	6,656,422	116,181	112,294	302,461	530,935	156,473	1,479,545	1,636,018
1989	1,224,538	1,553,352	2,777,890	108,320	102,804	260,092	471,217	152,173	1,210,940	1,363,112
1990	443,002	824,055	1,267,057	224,283	224,188	625,213	1,073,684	222,208	1,559,457	1,781,665
1991	99,848	89,269	189,117	413,426	383,368	946,246	1,743,040	298,398	2,184,088	2,482,487
1992	57,045	62,083	119,128	182,231	169,968	442,055	794,255	361,210	3,504,755	3,865,965
1993	122,423	128,634	251,057	129,344	125,312	342,416	597,071	1,170,649	11,997,953	13,168,602
1994	71,274	83,270	154,544	46,042	58,050	229,649	333,741	4,260,734	46,401,596	50,662,331
1995	30,605	29,271	59,876	97,808	97,063	257,484	452,355	12,268,787	155,255,850	167,524,637
1996	20,275	19,069	39,344	49,854	48,056	127,493	225,403	11,284,548	145,409,410	156,693,959
1997	20,039	107,784	127,823	82,598	78,996	209,517	371,111	3,184,506	38,158,718	41,343,224
1998	17,423	21,572	38,995	27,302	24,121	63,057	114,480	883,110	10,563,359	11,446,469
1999	67,602	106,355	173,957	74,165	73,552	208,296	356,013	928,738	9,596,058	10,524,796
2000	16,252	37,932	54,185	27,445	28,844	80,346	136,635	488,160	5,529,102	6,017,261
2001	6,598	13,750	20,347	140,394	270,055	1,856,845	2,267,294	72,358	539,206	611,564
2002	19,917	45,940	65,857	805,478	1,189,615	5,876,842	7,871,934	63,183	376,338	439,521
2003	54,235	20,712	74,947	1,156,874	1,331,274	4,619,175	7,107,323	(2,583)	77,174	74,591
2004	153,240	20,534	173,774	360,395	346,064	4,106,508	4,812,967	8,906	46,169	55,074
2005	60,543	62,997	123,541	358,153	339,995	1,541,971	2,240,119	(10,551)	(177,303)	(187,854)
2006	887,961	20,258	908,219	712,393	661,559	1,591,946	2,965,898	6,552	61,580	68,131
2007	3,237,280	43,244	3,280,524	716,892	662,573	1,590,087	2,969,552	15,302	82,398	97,700
2008	7,903,072	61,968	7,965,040	1,318,425	1,216,935	2,912,928	5,448,287	22,796	88,980	111,775
2009	1,197,373	20,419	1,217,792	2,755,572	2,577,576	6,147,431	11,480,759	8,736	74,428	83,164
2010	397,066	4,083	401,149	3,666,614	3,335,120	8,365,323	15,367,058	75,600	140,623	216,223
2011	155,151	16,415	171,566	3,818,218	3,619,872	8,725,837	16,163,927	100,389	189,928	290,317
2012	344,257	302,679	646,936	2,284,626	2,210,794	5,640,000	10,135,421	46,118	192,403	238,521
2013	427,657	426,180	853,837	983,507	1,039,603	3,311,693	5,334,803	138,430	529,491	667,921
2014	801,146	732,603	1,533,749	555,096	557,559	1,417,084	2,529,739	690,724	2,196,826	2,887,550
2015	<b>290,004</b>	<b>265,892</b>	<b>555,896</b>	<b>140,882</b>	<b>159,895</b>	<b>443,143</b>	<b>743,919</b>	<b>207,406</b>	<b>552,763</b>	<b>760,169</b>
2016	124,951	115,945	240,896	29,052	34,002	95,942	158,996	64,256	193,529	257,785
2017	0	0	0	0	0	0	0	3,696	6,819	10,515
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>55,171,844</b>	<b>52,567,598</b>	<b>107,739,442</b>	<b>28,283,199</b>	<b>29,870,192</b>	<b>92,433,519</b>	<b>150,586,910</b>	<b>40,330,394</b>	<b>446,169,682</b>	<b>486,500,076</b>

Note: Allocated capital costs as a result of permanent water transfers under Monterey are not reflected on this Table.

(a) Costs from Table B-10 allocated to Solano County Water Agency are reduced herein by \$2,102,700 in 1986 and \$1,823,500 in 1987 under provisions of Amendment No. 10 to its water supply contract.

**TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District (b)	Future Contractor San Joaquin Valley	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Municipal and (c) Industrial	Agri-cultural				
				[11]	[12]	[13]				
1952	389	20	58	938	119	9,129	20	12	785	11,470
1953	1,076	53	161	2,887	345	27,383	55	33	2,157	34,150
1954	1,350	68	201	3,373	417	32,369	69	43	2,718	40,608
1955	677	34	101	1,497	197	14,721	35	23	1,371	18,656
1956	726	34	108	2,702	273	24,255	35	25	1,416	29,575
1957	932	38	139	6,048	494	49,932	39	29	1,707	59,359
1958	2,308	102	344	14,374	1,153	119,049	104	61	4,368	141,862
1959	7,384	364	2,517	26,218	2,597	253,891	372	381	14,757	308,481
1960	12,940	630	3,666	34,054	4,155	352,166	644	498	25,696	434,448
1961	21,848	1,063	3,954	51,407	6,500	538,707	1,087	598	43,377	668,542
1962	49,320	2,410	7,867	94,933	13,834	1,017,146	2,465	1,879	98,141	1,297,996
1963	208,757	10,687	32,172	364,014	55,715	3,934,636	10,932	5,990	425,330	5,048,232
1964	328,286	16,961	64,890	600,152	89,904	6,636,279	17,350	11,942	672,013	8,436,776
1965	538,215	27,481	117,996	1,098,999	152,930	11,999,892	28,116	21,802	1,095,126	15,080,557
1966	1,107,757	52,586	279,172	2,218,832	339,222	24,857,487	53,789	38,891	2,173,090	31,120,826
1967	852,537	39,537	445,562	2,012,744	286,990	23,629,026	40,444	34,775	1,653,429	28,995,045
1968	198,739	9,739	166,267	1,104,132	70,086	11,544,942	9,962	12,238	396,075	13,512,180
1969	94,436	4,793	35,473	616,516	27,216	6,416,147	4,903	7,302	191,574	7,398,361
1970	54,344	2,720	21,686	414,659	15,520	4,145,046	2,782	3,999	109,470	4,770,226
1971	25,462	1,291	12,094	190,552	7,114	1,622,274	1,320	540	51,618	1,912,264
1972	11,589	589	8,354	82,886	3,409	723,623	602	343	23,526	854,921
1973	6,657	335	10,201	39,973	1,980	458,527	343	221	13,448	531,685
1974	9,478	469	11,044	45,420	2,766	483,866	479	326	18,979	572,828
1975	13,329	677	5,246	36,467	3,710	382,743	692	425	27,048	470,338
1976	17,506	837	12,615	53,085	5,621	654,026	856	1,152	34,455	780,152
1977	9,672	436	47,790	36,478	3,753	886,672	446	494	18,497	1,004,236
1978	23,499	(30,406)	6,178	54,219	6,579	575,169	1,209	1,402	47,446	685,296
1979	25,051	1,295	5,664	53,866	6,610	559,746	1,325	1,862	51,293	706,711
1980	144,980	(4,617)	31,160	321,890	38,126	3,211,810	7,682	7,144	297,215	4,055,391
1981	(5,427)	(15,464)	200	(44,773)	(1,223)	(385,275)	(296)	1,752	(11,324)	(461,830)
1982	49,916	2,584	6,600	83,283	13,142	654,692	2,638	1,252	102,287	916,395
1983	52,429	(35,295)	12,125	110,465	13,872	1,073,500	2,769	1,327	107,337	1,338,529
1984	86,345	4,474	14,303	154,799	22,764	1,617,225	4,572	2,678	177,020	2,084,180
1985	25,435	1,311	5,649	47,055	6,766	484,485	1,341	1,176	52,013	625,231
1986	38,309	(41,067)	9,862	71,661	10,320	796,097	2,009	778	78,142	966,110
1987	28,769	1,476	7,004	55,537	7,969	616,845	1,509	1,491	58,679	779,729
1988	52,329	2,831	17,078	70,572	12,049	909,046	2,894	4,620	109,713	1,181,132
1989	156,099	8,019	27,551	352,103	42,943	3,834,481	8,201	12,134	318,604	4,760,133
1990	292,361	15,142	50,360	553,394	87,199	6,094,021	15,487	22,729	599,233	7,729,927
1991	349,413	18,103	60,419	580,572	91,765	6,447,565	18,515	23,486	716,292	8,306,130
1992	125,891	6,439	28,019	241,559	34,559	2,711,639	6,585	10,883	256,370	3,421,943
1993	86,113	4,375	30,245	174,630	23,840	2,059,168	4,474	4,698	174,772	2,562,314
1994	64,762	3,323	23,894	124,518	17,633	1,488,418	3,398	2,173	132,095	1,860,213
1995	82,969	(1,000)	72,734	167,698	24,390	2,472,332	4,355	2,824	169,318	2,995,621
1996	27,611	(61,913)	51,990	68,870	8,812	1,233,548	1,437	1,590	56,092	1,388,037
1997	136,503	7,041	48,721	241,400	36,417	2,951,687	7,195	3,706	279,205	3,711,875
1998	70,737	(121,004)	23,083	122,934	18,622	1,474,568	3,742	1,278	144,963	1,738,923
1999	81,197	4,192	26,645	142,983	21,661	1,715,933	4,285	3,846	166,160	2,166,900
2000	21,089	1,073	9,822	45,704	6,013	547,927	1,096	(1,081)	42,826	674,466
2001	17,776	907	7,862	36,078	5,062	432,671	927	781	36,153	538,217
2002	74,205	3,811	16,014	132,974	20,050	1,498,693	3,898	727	151,445	1,901,817
2003	(51,255)	(2,679)	(5,522)	(76,239)	(13,107)	(824,213)	(2,740)	337	(105,557)	(1,080,975)
2004	7,704	394	2,497	17,036	2,079	183,122	404	1,518	15,697	230,453
2005	28,573	1,473	5,736	52,697	7,564	539,512	1,505	561	58,418	696,039
2006	4,614	237	1,046	20,401	1,232	90,220	243	731	9,413	128,136
2007	12,178	612	3,707	31,565	3,384	269,970	626	891	24,570	347,504
2008	44,346	2,290	8,688	75,101	11,697	830,658	2,341	2,047	90,762	1,067,930
2009	15,016	764	3,222	48,339	4,073	302,853	782	986	30,506	406,540
2010	26,999	1,400	36,002	67,320	7,061	844,568	1,432	283	55,376	1,040,441
2011	34,402	1,785	47,941	66,136	8,993	1,099,107	1,825	1,245	70,569	1,332,002
2012	35,485	1,794	14,869	68,191	9,739	818,189	1,835	2,624	71,847	1,024,574
2013	160,312	8,207	47,696	282,822	42,994	3,325,126	8,394	13,255	326,638	4,215,446
2014	181,207	9,270	267,715	334,613	48,800	6,361,409	9,483	6,543	369,064	7,588,104
2015	149,974	7,738	87,585	255,382	39,621	3,538,485	7,913	8,814	306,791	4,402,303
2016	79,483	4,092	25,625	134,864	21,087	1,618,778	4,184	1,286	162,410	2,051,809
2017	0	0	1,766	0	0	20,141	0	0	0	21,907
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>6,413,110</b>	<b>(13,041)</b>	<b>2,431,434</b>	<b>14,495,560</b>	<b>1,866,176</b>	<b>164,907,851</b>	<b>327,412</b>	<b>300,403</b>	<b>12,900,028</b>	<b>203,628,933</b>

(b) Costs from Table B-10 allocated to Empire West Side Irrigation District are reduced herein by \$31,588 in 1978; \$12,129 in 1980; \$15,173 in 1981; \$38,004 in 1983; \$43,033 in 1986; \$5,261 in 1995; \$63,318 in 1996 and \$124,667 in 1998 in accordance with letters of agreement with the district.

(c) Costs related to maximum annual Table A of 15,000 acre-feet under Amendment No. 18 of the water supply contract with Kern County Water Agency.

**TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency (d)	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]
1952	3,158	1,042	850	254	1,402	70	1,695	418	6,079	1,550
1953	10,026	3,327	2,668	799	4,401	222	5,318	1,328	19,058	4,852
1954	12,742	4,193	3,465	1,031	5,714	285	6,908	1,691	24,608	6,290
1955	5,411	1,881	1,374	401	2,267	115	2,756	715	9,229	2,377
1956	9,775	3,590	2,196	612	3,622	191	4,449	1,267	13,138	3,438
1957	26,306	9,255	6,343	1,816	10,461	540	12,767	3,450	40,646	10,534
1958	49,204	17,599	11,581	3,290	19,099	991	23,360	6,414	72,708	18,898
1959	70,247	29,740	15,869	4,616	26,171	1,347	31,759	9,030	98,596	25,519
1960	84,552	38,760	22,068	6,797	36,395	1,547	43,260	10,772	147,170	37,469
1961	126,542	54,262	34,613	12,530	57,086	2,245	63,709	16,437	236,164	57,707
1962	198,558	85,352	43,719	13,861	72,102	3,344	84,709	24,943	253,435	64,330
1963	580,138	255,252	116,797	33,149	192,624	9,828	234,926	73,256	610,277	160,624
1964	1,094,365	501,858	209,462	55,445	345,446	18,442	429,605	137,769	1,026,066	276,118
1965	1,908,076	947,523	385,533	103,757	635,825	32,819	786,986	244,587	1,913,090	512,862
1966	3,960,302	2,150,972	812,655	215,858	1,340,235	69,325	1,664,584	517,269	3,943,586	1,062,417
1967	4,976,538	4,100,531	1,077,422	296,069	1,776,892	88,301	2,182,240	653,250	5,821,681	1,550,239
1968	5,924,474	3,998,942	1,350,742	368,156	2,227,646	107,350	2,738,009	783,940	7,982,824	2,122,940
1969	5,822,708	3,079,426	1,690,259	539,851	2,787,631	121,303	3,256,507	865,455	10,898,185	2,769,647
1970	5,032,959	3,277,778	2,050,788	695,345	3,382,251	106,381	3,872,367	736,755	13,795,809	3,457,109
1971	2,577,507	2,146,954	1,071,523	338,581	1,767,179	48,337	2,087,223	347,057	8,137,053	1,987,120
1972	973,436	283,257	331,759	92,079	547,138	19,134	668,550	134,360	2,691,137	697,957
1973	354,407	914,303	158,579	82,223	261,557	6,304	238,094	46,102	1,760,570	403,582
1974	451,450	280,861	259,175	74,113	427,433	8,143	518,453	59,145	1,617,394	425,927
1975	253,438	246,492	193,632	52,821	319,337	4,954	392,110	33,995	1,533,664	407,913
1976	237,539	255,238	136,751	37,235	225,529	4,245	277,807	31,002	962,280	255,901
1977	199,554	371,469	191,384	25,858	150,711	3,757	183,609	26,834	591,445	155,537
1978	302,111	470,176	78,573	22,226	129,584	5,233	157,815	38,654	428,989	111,769
1979	357,678	938,985	81,807	21,795	134,915	5,965	166,931	44,410	403,569	108,408
1980	1,867,517	1,777,294	423,755	113,166	698,855	32,435	864,104	240,899	2,040,757	548,085
1981	(158,728)	610,795	(47,102)	(8,865)	(77,678)	(2,576)	(102,568)	(19,588)	(143,875)	(43,557)
1982	1,557,934	861,928	298,770	78,903	492,728	26,237	613,587	196,672	1,421,407	388,261
1983	2,062,512	521,349	396,033	115,678	653,134	34,699	803,945	259,939	2,126,313	581,672
1984	1,518,361	295,783	297,559	85,097	490,731	27,272	606,124	188,562	1,546,628	423,408
1985	896,226	158,810	217,115	62,532	358,064	13,104	441,299	107,533	1,116,949	305,291
1986	841,555	104,860	221,194	58,152	364,790	9,038	454,702	93,309	1,048,625	286,302
1987	333,052	105,625	166,099	43,992	273,928	5,566	340,485	40,716	783,725	213,202
1988	259,234	174,155	65,831	22,723	108,570	3,384	128,339	26,743	429,498	113,644
1989	1,045,999	434,394	323,138	97,036	532,920	16,777	649,616	125,344	1,375,722	372,048
1990	678,053	374,313	332,566	97,789	548,468	7,335	672,344	67,179	1,509,745	409,710
1991	831,687	401,961	367,196	120,925	605,579	11,966	733,443	92,625	1,979,364	540,210
1992	633,272	356,952	270,826	131,328	446,647	9,556	501,634	76,760	2,093,387	573,386
1993	634,283	332,089	222,347	171,095	366,700	10,194	353,470	73,955	3,848,084	1,046,752
1994	467,409	165,607	132,599	93,839	218,685	7,255	218,494	53,209	2,347,599	637,733
1995	459,990	293,308	132,690	78,390	218,835	7,436	232,377	54,544	1,960,100	530,656
1996	299,764	206,742	110,520	44,965	182,270	4,885	211,872	35,808	4,024,655	972,829
1997	438,898	249,699	103,382	24,640	170,497	7,397	214,534	54,452	2,892,626	397,103
1998	234,379	202,650	62,492	41,136	103,063	3,989	106,009	29,551	3,683,353	303,255
1999	268,224	175,939	89,312	40,069	147,294	4,812	167,592	35,399	5,733,587	235,054
2000	139,035	77,889	54,795	23,903	90,369	2,665	103,194	19,150	14,346,200	171,107
2001	130,754	44,790	50,816	15,641	83,805	2,989	102,254	20,949	20,292,396	96,254
2002	167,056	107,515	34,405	11,395	56,741	2,453	68,208	18,551	9,841,902	126,427
2003	(45,784)	(11,499)	2,940	2,123	4,849	(803)	4,179	(5,961)	3,944,702	27,216
2004	63,046	38,831	20,124	5,569	33,188	1,133	41,043	8,244	2,148,312	38,381
2005	185,058	105,447	38,609	11,966	63,674	3,220	76,154	23,692	990,923	61,078
2006	324,022	242,171	66,454	24,707	109,600	5,452	123,059	40,808	2,029,669	111,399
2007	253,594	180,062	56,816	21,827	93,702	4,478	109,787	32,702	2,130,791	107,450
2008	127,876	161,840	65,261	59,471	107,643	2,270	71,449	16,554	3,345,625	256,982
2009	578,313	339,829	153,734	60,383	253,550	9,841	275,776	73,233	4,780,697	271,733
2010	644,608	340,676	193,699	62,811	319,456	10,806	370,983	81,033	5,463,969	285,765
2011	326,828	210,229	227,796	58,634	375,678	5,489	468,648	41,120	6,462,756	284,070
2012	171,692	100,373	322,644	82,393	532,100	3,406	665,881	23,500	12,130,397	415,671
2013	474,122	225,942	272,128	71,316	448,790	9,223	560,469	64,227	34,506,263	378,986
2014	634,871	631,753	214,879	61,811	354,377	11,636	438,321	83,413	1,335,417	363,700
2015	<b>414,897</b>	<b>316,380</b>	<b>90,553</b>	<b>24,713</b>	<b>149,340</b>	<b>7,502</b>	<b>186,343</b>	<b>54,141</b>	<b>918,253</b>	<b>247,528</b>
2016	198,975	141,505	48,571	17,032	80,103	3,727	96,489	26,433	354,828	96,179
2017	0	2,578	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>55,561,785</b>	<b>35,529,581</b>	<b>16,342,134</b>	<b>5,228,853</b>	<b>26,951,694</b>	<b>996,968</b>	<b>32,110,144</b>	<b>7,305,724</b>	<b>231,879,798</b>	<b>28,874,004</b>

(d) Costs from Table B-10 allocated to Castaic Lake Water Agency are reduced herein by \$14,088 in 1978 in accordance with a letter of agreement with the district.



**TABLE B-14 Capital Costs of Transportation Facilities Allocated to Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California (e)	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1952	962	69,020	370	86,871	0	0	0	0	59	99,353
1953	3,011	217,634	1,187	273,833	0	0	0	0	264	311,812
1954	3,904	279,967	1,496	352,294	0	0	0	0	766	402,143
1955	1,474	111,602	670	140,272	0	0	0	0	969	169,342
1956	2,127	179,335	1,299	225,040	0	0	0	0	9,172	351,551
1957	6,526	516,050	3,367	648,059	0	0	0	0	23,172	1,464,452
1958	11,701	945,684	6,390	1,186,917	0	0	2	2	32,888	2,286,623
1959	15,815	1,364,298	9,894	1,702,901	0	0	14	14	57,918	2,967,412
1960	23,307	1,914,521	12,798	2,379,418	0	0	28	28	123,202	4,660,833
1961	36,153	3,212,125	18,770	3,928,343	0	0	10	10	316,220	8,545,244
1962	40,012	3,543,471	29,069	4,456,905	0	0	32	32	228,202	8,875,171
1963	99,266	11,185,928	86,807	13,638,873	0	0	51	51	528,496	24,610,278
1964	170,012	18,065,455	164,709	22,494,750	0	0	7,791	7,791	590,034	41,736,060
1965	316,082	33,763,577	307,475	41,858,192	0	0	3,139	3,139	332,680	62,664,743
1966	654,194	74,485,027	681,898	91,558,323	0	0	(48)	(48)	783,728	129,110,330
1967	958,406	130,599,417	1,279,076	155,360,062	0	0	47	47	1,479,421	194,146,365
1968	1,314,841	147,502,290	1,360,687	177,782,842	0	0	51,573	51,573	1,254,192	197,978,911
1969	1,726,891	140,096,646	1,085,026	174,739,535	0	0	234,232	234,232	398,183	184,473,490
1970	2,160,122	161,983,078	1,147,609	201,698,371	0	0	16,227	16,227	74,028	207,082,650
1971	1,237,573	133,903,316	738,822	156,388,246	0	0	27,204	27,204	12,457	158,624,739
1972	434,507	43,931,880	66,878	50,872,072	0	0	9	9	13,182	51,936,917
1973	256,711	39,723,010	290,020	44,495,462	0	0	25	25	8,099	45,263,853
1974	264,349	18,896,593	86,362	23,369,399	0	0	45	45	28,570	24,402,166
1975	253,838	16,732,939	83,975	20,509,109	0	0	21	21	8,226	21,318,838
1976	158,850	13,545,451	84,623	16,212,450	0	0	51	51	16,486	17,492,910
1977	96,517	11,769,352	110,833	13,776,859	0	0	28	28	21,181	15,544,382
1978	69,152	15,781,696	174,876	17,770,853	0	0	38	38	28,876	19,073,475
1979	66,847	27,627,424	343,361	30,302,931	0	0	23	23	26,668	31,857,362
1980	337,811	59,493,774	641,586	69,080,039	0	0	26	26	59,169	74,974,704
1981	(26,356)	15,661,179	224,257	15,865,338	0	0	34	34	(6,746)	15,727,602
1982	238,792	30,873,857	316,107	37,365,183	0	0	11	11	16,086	39,705,931
1983	357,812	25,056,047	187,121	33,156,253	0	0	19	19	72,225	38,006,645
1984	260,327	16,317,441	103,160	22,160,455	0	0	26	26	83,252	30,414,886
1985	187,699	10,243,779	56,162	14,164,564	0	0	29	29	16,338	28,581,730
1986	176,057	8,365,310	34,777	12,058,671	0	0	31	31	16,248	41,035,899
1987	131,163	6,955,356	36,142	9,429,050	0	0	32	32	29,062	32,523,660
1988	70,260	6,626,545	57,117	8,086,041	0	0	55	55	50,083	18,140,686
1989	227,772	18,531,680	153,200	23,885,645	0	0	44	44	43,324	33,301,366
1990	251,185	17,430,869	125,376	22,504,929	0	0	63	63	96,419	34,453,743
1991	331,235	20,792,168	132,558	26,940,915	0	0	54	54	149,922	39,811,664
1992	351,492	21,196,762	116,999	26,758,999	0	0	42	42	80,900	35,041,233
1993	646,980	29,471,748	105,693	37,283,389	0	0	30	30	59,324	53,921,787
1994	394,936	16,392,019	50,941	21,180,326	0	0	14	14	34,208	74,225,377
1995	331,286	16,078,395	72,214	20,450,221	0	0	3	3	42,395	191,525,108
1996	1,079,629	23,237,696	49,282	30,460,917	0	0	0	0	21,388	188,829,048
1997	1,914,804	13,530,777	72,335	20,071,144	0	0	3	3	34,976	65,660,155
1998	3,219,136	11,284,364	65,745	19,339,120	0	0	7	7	11,234	32,689,229
1999	5,888,075	9,063,618	54,504	21,903,479	0	0	2	2	34,616	35,159,766
2000	16,301,847	5,393,221	24,010	36,747,384	0	0	24	24	16,912	43,646,866
2001	23,613,431	2,988,800	13,047	47,455,926	0	0	20	20	68,013	50,961,381
2002	11,145,574	5,297,703	34,824	26,912,753	0	0	14	14	380,629	37,572,525
2003	4,489,333	3,954,532	(4,182)	12,361,646	0	0	0	0	590,121	19,127,653
2004	2,289,248	4,276,877	13,219	8,977,217	0	0	0	0	156,413	14,405,899
2005	809,998	6,615,802	36,038	9,021,661	0	0	0	0	123,949	12,017,455
2006	1,804,216	13,739,306	88,685	18,709,549	0	0	5	5	240,812	23,020,750
2007	2,115,304	11,645,968	64,671	16,817,153	0	0	0	0	241,461	23,763,893
2008	2,803,389	11,420,273	55,936	18,494,569	0	0	4	4	444,069	33,531,675
2009	4,253,359	22,121,478	122,392	33,294,318	0	0	13	13	938,784	47,421,370
2010	5,295,483	18,057,530	107,426	31,234,245	0	0	0	0	6,290,607	54,549,782
2011	6,508,124	12,504,183	53,549	27,527,104	0	0	1	1	2,488,078	47,972,994
2012	12,627,808	15,917,498	30,784	43,024,148	0	0	0	0	842,693	55,912,293
2013	39,163,617	23,714,159	65,964	99,955,208	0	0	0	0	455,304	111,482,519
2014	229,961	31,209,020	98,428	35,667,588	0	0	0	0	211,853	50,418,583
2015	159,630	48,215,114	77,491	50,861,884	0	0	0	0	64,881	57,389,562
2016	63,236	28,505,415	42,580	29,675,073	0	0	0	0	14,393	32,398,952
2017	0	16,315,023	0	16,317,601	0	0	0	0	0	16,350,023
2018	0	31,927,997	0	31,927,997	0	0	0	0	0	31,927,997
2019	0	15,410,551	0	15,410,551	0	0	0	0	0	15,410,551
2020	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>160,426,801</b>	<b>1,757,780,621</b>	<b>11,758,486</b>	<b>2,370,746,594</b>	<b>0</b>	<b>0</b>	<b>341,149</b>	<b>341,149</b>	<b>20,910,733</b>	<b>3,340,453,838</b>

(e) Costs from Table B-10 allocated to MWDSC are reduced herein by \$16,425,374 in 1972 under provisions of Amendment No. 7 to its water contract.

**TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor <sup>a b c</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	153,778	105,673	364,827	624,278	0	0	0
1964	0	0	0	216,203	170,929	530,036	917,168	6,696	21,667	28,363
1965	0	0	0	284,369	259,943	899,371	1,443,684	13,756	36,029	49,785
1966	18,063	0	18,063	320,384	290,808	1,073,270	1,684,462	26,524	61,349	87,873
1967	41,574	0	41,574	391,262	320,989	1,187,619	1,899,870	56,469	118,263	174,731
1968	121,509	0	121,509	507,895	361,935	1,309,946	2,179,776	104,160	208,037	312,197
1969	165,289	0	165,289	610,131	397,386	1,411,701	2,419,218	122,043	242,426	364,469
1970	169,077	0	169,077	644,496	412,322	1,450,660	2,507,478	125,963	250,808	376,771
1971	171,286	0	171,286	651,385	415,439	1,457,564	2,524,388	128,402	256,371	384,773
1972	172,649	0	172,649	652,834	416,368	1,461,847	2,531,048	129,861	260,482	390,343
1973	173,649	31,366	205,015	654,231	417,018	1,465,086	2,536,335	130,843	263,040	393,883
1974	176,527	32,938	209,466	655,273	417,636	1,467,092	2,540,000	132,015	265,901	397,916
1975	184,973	36,291	221,264	657,676	418,879	1,470,816	2,547,370	133,290	269,028	402,318
1976	189,650	40,836	230,485	659,048	419,684	1,472,924	2,551,655	134,041	272,155	406,196
1977	192,592	45,096	237,688	661,777	421,449	1,478,507	2,561,732	135,754	278,799	414,553
1978	195,860	49,178	245,038	665,434	423,747	1,485,299	2,574,480	141,271	292,281	433,552
1979	199,390	53,340	252,730	670,811	427,108	1,494,207	2,592,127	142,362	297,569	439,930
1980	209,132	67,748	276,880	674,680	429,296	1,499,843	2,603,818	143,530	303,969	447,499
1981	222,599	87,408	310,007	684,919	435,629	1,515,357	2,635,905	148,789	327,544	476,333
1982	234,191	106,918	341,110	682,881	434,108	1,512,014	2,629,004	148,004	320,657	468,660
1983	262,160	151,259	413,419	684,217	434,532	1,513,393	2,632,141	148,213	317,658	465,870
1984	326,072	224,245	550,317	695,371	441,230	1,530,671	2,667,272	149,853	323,275	473,127
1985	455,836	364,305	820,141	707,869	448,410	1,548,594	2,704,873	151,658	328,761	480,419
1986	819,636	692,479	1,512,115	709,844	449,390	1,551,318	2,710,553	152,545	332,779	485,324
1987	1,360,688	1,559,243	2,919,931	712,505	451,007	1,555,828	2,719,341	154,805	348,472	503,277
1988	1,771,651	2,208,121	3,979,772	716,801	453,514	1,562,985	2,733,300	161,346	417,591	578,937
1989	1,891,484	2,433,160	4,324,645	725,742	459,332	1,578,655	2,763,729	169,453	494,247	663,699
1990	1,955,330	2,514,151	4,469,481	733,850	464,692	1,592,216	2,790,758	177,387	557,384	734,771
1991	1,978,582	2,557,403	4,535,985	750,958	476,459	1,625,032	2,852,449	189,050	639,235	828,285
1992	1,983,860	2,562,121	4,545,981	781,557	496,722	1,675,047	2,953,326	204,822	754,678	959,500
1993	1,986,897	2,565,427	4,552,324	795,916	505,773	1,698,585	3,000,275	224,056	941,300	1,165,356
1994	1,993,467	2,572,330	4,565,797	806,347	512,498	1,716,961	3,035,806	286,878	1,585,162	1,872,040
1995	1,997,323	2,576,836	4,574,159	810,823	515,639	1,729,387	3,055,848	517,412	4,095,799	4,613,211
1996	1,998,994	2,578,433	4,577,427	818,727	520,936	1,743,439	3,083,103	1,187,010	12,569,247	13,756,257
1997	2,000,110	2,579,484	4,579,594	822,777	523,583	1,750,461	3,096,821	1,808,545	20,578,178	22,386,724
1998	2,001,225	2,585,478	4,586,703	829,507	527,976	1,762,113	3,119,597	1,985,644	22,700,288	24,685,933
1999	2,002,204	2,586,690	4,588,893	831,736	529,331	1,765,656	3,126,723	2,035,260	23,293,767	25,329,027
2000	2,006,043	2,592,730	4,598,773	990,917	533,508	1,777,485	3,301,911	2,088,005	23,838,744	25,926,748
2001	2,326,141	2,781,857	5,107,998	1,124,025	535,165	1,782,101	3,441,291	2,116,046	24,156,352	26,272,398
2002	2,326,580	2,782,697	5,109,277	1,138,427	550,866	1,890,059	3,579,352	2,120,253	24,187,702	26,307,955
2003	2,327,924	2,785,506	5,113,431	1,223,134	620,921	2,236,139	4,080,194	2,123,974	24,209,864	26,333,838
2004	2,331,608	2,786,800	5,118,408	1,356,793	700,388	2,511,867	4,569,048	2,123,820	24,214,471	26,338,291
2005	2,342,156	2,788,138	5,130,294	1,393,586	721,344	2,760,543	4,875,473	2,124,359	24,217,267	26,341,626
2006	2,346,408	2,792,371	5,138,778	1,429,103	742,250	2,855,355	5,026,708	2,123,710	24,206,365	26,330,075
2007	2,409,448	2,793,752	5,203,201	1,500,373	783,593	2,954,841	5,238,806	2,124,120	24,210,213	26,334,333
2008	2,643,266	2,796,757	5,440,023	1,573,167	825,720	3,055,940	5,454,826	2,125,092	24,215,452	26,340,544
2009	3,224,643	2,801,088	6,025,731	1,709,530	904,528	3,244,580	5,858,638	2,126,569	24,221,214	26,347,783
2010	3,314,473	2,802,556	6,117,029	2,001,740	1,074,753	3,650,561	6,727,054	2,127,146	24,226,130	26,353,275
2011	3,344,890	2,802,854	6,147,744	2,700,112	1,299,661	4,214,687	8,214,460	2,132,248	24,235,613	26,367,861
2012	3,357,049	2,804,036	6,161,085	3,197,050	1,549,289	4,816,425	9,562,765	2,139,171	24,248,710	26,387,881
2013	3,384,792	2,827,281	6,212,073	3,285,900	1,599,766	4,849,956	9,735,622	2,142,428	24,262,300	26,404,728
2014	3,420,172	2,860,820	6,280,991	3,338,180	1,609,847	4,924,734	9,872,762	2,145,764	24,279,004	26,424,767
<b>2015</b>	<b>3,488,289</b>	<b>2,920,400</b>	<b>6,408,689</b>	<b>3,330,901</b>	<b>1,562,367</b>	<b>4,660,961</b>	<b>9,554,229</b>	<b>2,190,158</b>	<b>24,428,288</b>	<b>26,618,446</b>
2016	3,493,116	2,942,674	6,435,790	3,310,289	1,543,771	4,521,068	9,375,128	2,193,305	24,445,385	26,638,689
2017	3,477,695	2,952,696	6,430,391	3,239,727	1,516,284	4,414,320	9,170,332	2,168,451	24,403,805	26,572,256
2018	3,386,884	2,952,696	6,339,580	3,120,038	1,475,339	4,291,993	8,887,370	2,121,063	24,314,590	26,435,653
2019	3,337,134	2,952,696	6,289,830	3,014,515	1,439,888	4,190,239	8,644,642	2,103,180	24,280,201	26,383,381
2020	3,332,811	2,952,696	6,285,507	2,978,719	1,424,951	4,151,280	8,554,950	2,099,260	24,271,819	26,371,079
2021	3,330,279	2,952,696	6,282,975	2,971,521	1,421,834	4,144,375	8,537,730	2,096,821	24,266,256	26,363,077
2022	3,328,719	2,952,696	6,281,415	2,970,145	1,420,906	4,140,093	8,531,144	2,095,362	24,262,145	26,357,508
2023	3,327,576	2,919,163	6,246,739	2,968,736	1,420,256	4,136,853	8,525,845	2,094,380	24,259,587	26,353,967
2024	3,324,296	2,917,529	6,241,825	2,967,673	1,419,638	4,134,847	8,522,158	2,093,208	24,256,726	26,349,934
2025	3,314,680	2,913,952	6,228,633	2,965,337	1,418,395	4,131,123	8,514,856	2,091,933	24,253,600	26,345,533
2026	3,309,337	2,909,199	6,218,535	2,963,864	1,417,590	4,129,015	8,510,469	2,091,182	24,250,472	26,341,654
2027	3,305,965	2,904,764	6,210,729	2,960,876	1,415,825	4,123,433	8,500,134	2,089,469	24,243,828	26,333,297
2028	3,302,225	2,900,505	6,202,730	2,956,867	1,413,527	4,116,640	8,487,034	2,083,952	24,230,346	26,314,298
2029	3,298,188	2,896,137	6,194,324	2,950,870	1,410,165	4,107,732	8,468,767	2,082,861	24,225,059	26,307,920
2030	3,287,031	2,880,675	6,167,706	2,946,673	1,407,978	4,102,096	8,456,747	2,081,693	24,218,658	26,300,351
2031	3,271,615	2,859,608	6,131,223	2,935,191	1,401,645	4,086,582	8,423,418	2,076,434	24,195,083	26,271,517
2032	3,258,318	2,838,664	6,096,982	2,937,707	1,403,166	4,089,925	8,430,797	2,077,219	24,201,971	26,279,190
2033	3,226,258	2,791,213	6,017,471	2,936,466	1,402,742	4,088,546	8,427,754	2,077,010	24,204,970	26,281,980
2034	3,153,162	2,714,596	5,867,758	2,924,043	1,396,044	4,071,629	8,391,355	2,075,371	24,199,353	26,274,723
2035	3,005,019	2,568,294	5,573,313	2,910,196	1,388,864	4,053,345	8,352,406	2,073,565	24,193,866	26,267,431
<b>TOTAL</b>	<b>140,287,720</b>	<b>136,255,073</b>	<b>276,542,793</b>	<b>115,256,404</b>	<b>59,780,143</b>	<b>189,319,334</b>	<b>364,355,882</b>	<b>87,846,288</b>	<b>967,159,602</b>	<b>1,055,005,889</b>

(a) Unadjusted for prior overpayments or underpayments of charges.  
 (b) Determined at the current Project Interest Rate of 4.610 percent per annum.  
 (c) Reflects the transfers of permanent aqueduct capacity among contractors.

**TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor<sup>a b c</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency			County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Municipal and (d) Industrial	Agricultural				
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	0	2,725
1965	0	0	6,029	64,284	9,284	0	0	0	0	79,598
1966	0	0	12,039	120,256	17,073	0	0	0	0	149,368
1967	0	0	26,257	233,262	34,350	0	0	0	0	293,869
1968	78,329	1,795	48,950	335,771	48,966	427,820	9,407	4,812	66,040	1,021,890
1969	78,466	5,384	57,418	392,005	52,536	878,605	10,158	5,230	249,873	1,729,674
1970	85,998	5,384	59,224	423,404	53,922	1,068,647	10,446	5,439	184,912	1,897,376
1971	98,048	5,384	60,329	444,522	54,712	1,419,347	10,612	5,858	196,772	2,295,584
1972	109,551	5,384	60,945	454,227	55,075	2,125,350	10,694	11,226	607,027	3,439,478
1973	120,506	5,384	61,370	458,449	55,248	2,451,269	10,736	6,485	234,789	3,404,236
1974	182,895	5,384	61,890	460,485	55,349	2,745,058	10,770	7,261	389,710	3,918,801
1975	222,142	5,384	62,452	462,798	55,490	3,287,823	10,812	7,481	465,017	4,579,399
1976	169,371	5,384	62,720	464,655	55,679	3,544,246	10,853	8,449	332,663	4,654,019
1977	166,518	5,384	63,362	467,359	55,965	3,883,474	10,914	7,740	318,069	4,978,785
1978	178,020	0	65,796	469,216	56,156	4,316,809	11,019	8,159	341,251	5,446,427
1979	211,127	5,384	66,111	471,978	56,491	4,740,407	11,086	8,368	384,061	5,954,653
1980	224,580	5,384	66,399	474,721	56,828	5,172,459	11,157	11,924	386,535	6,409,987
1981	224,580	5,384	67,986	491,115	58,770	5,660,870	11,565	8,996	409,717	6,938,983
1982	224,580	5,384	67,996	488,835	58,707	6,111,657	11,552	9,414	432,359	7,410,485
1983	234,987	5,384	68,332	493,076	59,377	6,624,862	11,685	7,887	51,473	7,557,064
1984	247,038	5,384	68,950	498,702	60,083	6,953,669	11,834	10,041	337,536	8,193,237
1985	258,540	5,384	69,678	506,586	61,243	7,404,443	12,069	10,251	245,555	8,573,750
1986	270,043	5,384	69,966	508,983	61,587	7,524,644	12,141	10,669	524,006	8,987,423
1987	281,546	5,384	70,471	512,652	62,116	8,306,917	12,251	10,878	546,648	9,808,863
1988	293,049	5,384	70,832	515,513	62,526	8,731,990	12,334	11,297	569,290	10,272,214
1989	304,552	5,384	71,717	519,169	63,150	9,038,623	12,501	11,715	592,472	10,619,283
1990	158,027	5,384	73,153	537,527	65,389	9,357,204	12,936	11,924	638,834	10,860,379
1991	292,562	5,384	75,796	566,573	69,966	9,357,204	13,762	11,924	638,834	11,032,006
1992	316,055	5,384	78,990	597,260	74,817	9,357,204	14,756	11,924	638,834	11,095,224
1993	316,055	5,384	80,482	610,123	76,657	9,357,204	15,124	11,924	638,834	11,111,787
1994	316,055	5,384	82,105	619,494	77,936	9,357,204	15,397	11,924	638,834	11,124,333
1995	316,055	5,384	83,398	626,231	78,890	9,357,204	15,608	11,924	638,834	11,133,528
1996	292,338	5,384	87,367	635,384	80,221	9,036,531	15,961	11,924	638,834	10,803,945
1997	292,338	5,384	90,231	639,177	80,707	8,970,594	16,133	11,924	638,834	10,745,321
1998	292,337	5,384	92,940	652,602	82,732	8,717,960	16,588	11,924	638,834	10,511,302
1999	292,337	5,384	94,237	659,509	83,778	8,717,960	16,823	11,924	638,834	10,520,787
2000	292,337	5,384	95,750	667,629	85,008	8,074,573	17,096	11,924	638,834	9,888,536
2001	292,337	5,384	96,315	670,255	85,354	7,942,891	17,172	11,924	638,834	9,760,465
2002	314,518	5,384	96,772	672,352	85,648	7,942,891	17,237	11,924	599,972	9,746,697
2003	314,518	5,384	97,715	680,183	86,829	7,942,891	17,476	11,924	597,755	9,754,675
2004	314,518	5,384	97,385	675,632	86,046	7,930,824	45,026	11,924	515,180	9,681,920
2005	314,518	5,384	97,536	676,664	86,172	7,930,824	45,054	11,924	515,180	9,683,256
2006	314,518	5,384	97,889	679,904	86,637	7,930,824	46,839	11,924	513,490	9,687,410
2007	314,518	5,384	97,954	681,179	86,714	7,930,824	46,855	11,924	513,490	9,688,843
2008	314,518	5,384	98,190	683,186	86,930	7,930,824	46,899	11,924	513,490	9,691,345
2009	314,518	5,384	98,753	688,049	87,687	7,930,824	47,056	11,924	513,490	9,697,685
2010	276,175	5,384	98,965	691,242	87,956	7,758,047	47,110	11,924	474,696	9,451,499
2011	276,175	5,384	101,393	695,781	88,432	7,758,047	47,282	11,924	474,696	9,459,115
2012	276,175	5,384	104,699	700,342	89,052	7,758,047	47,511	11,924	474,696	9,467,831
2013	276,175	5,384	105,750	705,159	89,740	7,758,047	47,664	11,924	474,696	9,474,539
2014	265,258	5,384	106,481	725,654	92,856	7,758,047	48,333	11,924	466,655	9,480,592
2015	272,544	5,384	123,119	686,296	87,207	8,134,624	49,667	11,924	466,655	9,837,420
2016	272,544	5,384	123,831	649,921	82,458	8,134,624	50,450	11,924	466,655	9,797,790
2017	272,544	5,384	111,643	547,601	66,852	8,134,624	50,820	11,924	466,655	9,668,047
2018	272,544	5,384	89,095	445,092	52,236	8,134,624	41,418	11,924	466,655	9,518,972
2019	272,544	5,384	80,627	388,858	48,666	8,134,624	40,667	11,924	466,655	9,449,950
2020	250,633	5,384	78,821	357,459	47,280	8,134,624	40,379	11,924	466,655	9,393,159
2021	250,633	5,384	77,716	336,340	46,490	8,134,624	40,213	11,924	466,655	9,369,979
2022	250,633	5,384	77,100	326,635	46,128	8,134,624	40,131	11,924	466,655	9,359,214
2023	250,633	5,384	76,675	322,414	45,954	8,134,624	40,089	11,924	466,655	9,354,351
2024	250,633	5,384	76,155	320,378	45,853	8,134,624	40,055	11,924	466,655	9,351,661
2025	250,633	5,384	75,593	318,065	45,712	8,134,624	40,013	11,924	466,655	9,348,603
2026	250,633	5,384	75,325	316,208	45,523	8,134,624	39,972	11,924	466,655	9,346,248
2027	250,633	5,384	74,683	313,504	45,237	8,134,624	39,911	11,924	466,655	9,342,554
2028	250,633	5,384	72,249	311,646	45,046	8,134,624	39,805	11,924	466,655	9,337,966
2029	250,633	5,384	71,934	308,885	44,711	8,134,624	39,739	11,924	466,655	9,334,489
2030	250,633	5,384	71,646	306,141	44,374	8,134,624	39,668	11,924	466,655	9,331,049
2031	250,633	5,384	70,059	289,747	42,432	8,134,624	39,260	11,924	466,655	9,310,718
2032	250,633	5,384	70,049	292,028	42,495	8,134,624	39,273	11,924	466,655	9,313,064
2033	250,633	5,384	69,712	287,786	41,825	8,134,624	39,140	11,924	466,655	9,307,684
2034	250,633	5,384	69,095	282,160	41,119	8,134,624	38,991	11,924	466,655	9,300,585
2035	250,633	5,384	68,367	274,276	39,959	8,134,624	38,756	11,924	466,655	9,290,578
<b>TOTAL</b>	<b>16,992,249</b>	<b>357,139</b>	<b>5,503,683</b>	<b>34,850,554</b>	<b>4,450,398</b>	<b>483,110,427</b>	<b>1,852,708</b>	<b>738,084</b>	<b>31,979,024</b>	<b>579,834,266</b>

- (a) Unadjusted for prior overpayments or underpayments of charges.
- (b) Determined at the current Project Interest Rate of 4.610 percent per annum.
- (c) Reflects the transfers of permanent aqueduct capacity among contractors.
- (d) Charges under Amendment No. 18 of the water supply contract with Kern County Water Agency.

**TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor<sup>a b c</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	34,411	0	0	0	726	0	0	0	51,729	0
1964	64,494	27,447	19,542	4,370	38,211	1,143	30,324	8,205	82,811	34,987
1965	121,484	53,007	34,348	7,194	42,701	2,082	53,730	15,222	135,069	35,344
1966	221,012	101,264	62,476	12,478	76,886	3,753	96,944	27,679	232,502	61,465
1967	427,622	210,814	121,269	23,472	148,839	7,284	188,141	54,023	433,350	115,574
1968	689,327	419,886	206,952	38,551	245,877	11,781	311,520	87,293	729,849	194,527
1969	1,003,797	623,799	318,583	57,301	368,426	17,249	467,673	127,219	1,136,415	302,649
1970	1,312,832	780,737	451,031	84,796	520,243	23,427	651,014	171,297	1,691,461	443,708
1971	1,581,850	947,865	595,102	120,210	700,914	28,845	863,569	208,821	2,394,083	619,778
1972	1,720,363	1,057,593	671,098	137,454	795,465	31,306	979,206	226,497	2,808,504	720,983
1973	1,772,377	1,072,197	696,065	142,143	825,044	32,281	1,016,891	233,340	2,945,564	756,530
1974	1,791,355	1,118,922	707,278	146,331	839,031	32,602	1,030,766	235,688	3,035,230	777,084
1975	1,815,881	1,133,522	724,295	150,105	861,611	33,017	1,059,682	238,700	3,117,604	798,777
1976	1,829,760	1,146,215	736,112	152,796	878,290	33,269	1,080,890	240,431	3,195,714	819,552
1977	1,842,615	1,159,398	744,718	154,692	890,124	33,485	1,096,335	242,010	3,244,723	832,585
1978	1,853,320	1,178,553	750,463	156,009	898,031	33,676	1,106,963	243,377	3,274,845	840,506
1979	1,869,355	1,202,728	756,140	157,141	904,897	33,943	1,116,475	245,346	3,296,693	846,199
1980	1,888,324	1,250,787	762,012	158,225	912,220	34,247	1,126,485	247,607	3,317,247	851,720
1981	1,987,339	1,341,569	796,384	164,015	950,529	35,899	1,176,208	259,877	3,421,183	879,634
1982	1,978,809	1,372,922	789,720	163,563	945,667	35,768	1,170,315	258,879	3,413,856	877,416
1983	2,061,590	1,417,099	809,319	167,582	971,692	37,104	1,204,224	268,895	3,486,248	897,190
1984	2,171,231	1,443,828	834,564	173,473	1,006,034	38,871	1,243,893	282,134	3,594,542	926,815
1985	2,251,676	1,459,137	851,720	177,807	1,031,452	40,260	1,276,416	291,738	3,673,311	948,379
1986	2,299,323	1,467,468	863,875	180,992	1,049,921	40,927	1,308,981	297,214	3,730,198	963,927
1987	2,344,046	1,473,086	876,261	183,970	1,068,826	41,390	1,324,799	301,992	3,783,895	978,588
1988	2,362,143	1,478,756	885,509	186,235	1,083,080	41,677	1,343,449	304,089	3,824,257	989,568
1989	2,376,030	1,487,946	889,631	187,412	1,088,857	41,852	1,350,988	305,475	3,846,509	995,456
1990	2,432,706	1,510,767	912,986	192,472	1,118,024	42,727	1,387,897	312,010	3,918,238	1,014,854
1991	2,469,661	1,530,414	932,659	197,604	1,147,282	43,112	1,424,004	315,536	3,997,480	1,036,359
1992	2,514,880	1,551,660	953,475	203,996	1,179,589	43,744	1,463,291	320,432	4,102,102	1,064,912
1993	2,549,874	1,570,667	969,784	210,989	1,203,773	44,253	1,490,698	324,519	4,213,571	1,095,444
1994	2,585,113	1,588,489	983,985	220,171	1,223,934	44,800	1,510,504	328,488	4,420,076	1,151,617
1995	2,611,217	1,597,449	992,587	225,248	1,236,069	45,193	1,522,852	331,367	4,547,097	1,186,123
1996	2,637,094	1,613,457	1,001,843	229,526	1,248,440	45,599	1,536,278	334,344	4,654,074	1,215,084
1997	2,654,359	1,624,844	1,010,118	232,003	1,258,944	45,868	1,548,754	336,316	4,875,746	1,268,686
1998	2,679,335	1,638,731	1,017,568	233,373	1,268,786	46,279	1,574,235	339,344	5,036,613	1,290,750
1999	2,692,811	1,650,116	1,022,130	235,684	1,274,800	46,503	1,581,509	341,005	5,243,553	1,307,788
2000	2,708,447	1,650,073	1,028,194	237,960	1,283,376	46,776	1,592,264	343,015	5,569,174	1,321,137
2001	2,716,761	1,650,014	1,032,076	239,333	1,288,723	46,930	1,599,106	344,219	5,693,264	1,330,966
2002	2,741,292	1,650,307	1,035,440	240,242	1,293,682	47,103	1,605,556	345,493	5,753,077	1,336,562
2003	2,751,299	1,650,949	1,038,199	240,913	1,297,179	47,248	1,611,477	346,885	5,812,654	1,344,008
2004	2,748,722	1,650,865	1,039,626	241,040	1,297,500	47,200	1,611,206	347,384	5,838,121	1,345,632
2005	2,752,703	1,650,284	1,040,107	241,377	1,297,675	47,268	1,611,327	347,958	5,851,216	1,347,956
2006	2,764,466	1,650,719	1,043,611	242,113	1,297,370	47,466	1,612,927	348,639	5,879,145	1,351,712
2007	2,785,613	1,650,937	1,046,884	243,657	1,299,414	47,807	1,613,406	349,174	5,905,986	1,358,674
2008	2,802,414	1,650,549	1,049,391	245,045	1,301,908	48,092	1,614,741	349,726	5,932,827	1,365,505
2009	2,810,888	1,650,461	1,051,451	246,896	1,304,516	48,239	1,616,076	350,278	5,959,668	1,372,337
2010	2,850,851	1,650,877	1,054,017	250,884	1,308,560	48,889	1,620,369	351,819	6,012,449	1,380,149
2011	2,896,448	1,650,146	1,057,292	257,120	1,313,480	49,618	1,625,177	353,360	6,065,315	1,388,016
2012	2,920,624	1,650,795	1,060,931	261,163	1,318,349	49,996	1,629,997	354,901	6,118,181	1,395,883
2013	2,900,050	1,650,417	1,064,748	266,983	1,323,266	50,237	1,634,817	356,442	6,171,046	1,403,750
2014	2,924,712	1,650,301	1,068,565	267,781	1,328,183	49,762	1,639,637	357,983	6,223,911	1,411,617
<b>2015</b>	<b>2,916,495</b>	<b>1,650,025</b>	<b>1,072,382</b>	<b>269,561</b>	<b>1,333,100</b>	<b>49,690</b>	<b>1,644,457</b>	<b>359,524</b>	<b>6,276,776</b>	<b>1,419,484</b>
2016	2,849,374	1,650,088	1,076,200	266,173	1,338,017	48,594	1,649,277	361,065	6,329,641	1,427,351
2017	2,658,766	1,650,467	1,080,019	256,529	1,342,934	45,359	1,654,097	362,606	6,382,506	1,435,218
2018	2,397,061	1,650,865	1,083,838	241,450	1,347,851	40,862	1,658,917	364,147	6,435,371	1,443,085
2019	2,082,591	1,650,824	1,087,657	222,700	1,352,768	35,394	1,663,737	365,688	6,488,236	1,450,952
2020	1,773,556	1,650,114	1,091,476	195,205	1,357,685	29,216	1,668,557	367,229	6,541,101	1,458,819
2021	1,504,538	1,650,035	1,095,295	159,791	1,362,602	23,798	1,673,377	368,770	6,593,966	1,466,686
2022	1,366,025	1,650,500	1,099,114	142,547	1,367,519	21,337	1,678,197	370,311	6,646,831	1,474,553
2023	1,314,011	1,625,775	1,102,933	137,858	1,372,436	20,362	1,683,017	371,852	6,699,696	1,482,420
2024	1,295,033	1,566,901	1,106,752	133,670	1,377,353	20,041	1,687,837	373,393	6,752,561	1,490,287
2025	1,270,507	1,549,037	1,110,571	129,896	1,382,270	19,626	1,692,657	374,934	6,805,426	1,498,154
2026	1,256,628	1,530,789	1,114,390	127,205	1,387,187	19,374	1,697,477	376,475	6,858,291	1,506,021
2027	1,243,773	1,512,278	1,118,209	125,309	1,392,104	19,158	1,702,297	378,016	6,911,156	1,513,888
2028	1,233,068	1,484,442	1,122,028	123,392	1,397,021	18,966	1,707,117	379,557	6,964,021	1,521,755
2029	1,217,033	1,446,129	1,125,847	122,860	1,401,938	18,700	1,711,937	381,098	7,016,886	1,529,622
2030	1,198,064	1,368,915	1,129,666	121,750	1,406,855	18,396	1,716,757	382,639	7,069,751	1,537,489
2031	1,099,049	1,225,862	1,033,614	115,987	1,311,802	16,744	1,500,223	354,444	6,322,198	1,411,617
2032	1,107,579	1,174,357	1,037,433	116,438	1,316,719	16,875	1,505,140	355,985	6,375,063	1,419,484
2033	1,024,798	1,101,806	1,041,252	112,419	1,221,664	15,539	1,409,599	340,239	5,822,294	1,307,788
2034	915,157	1,059,569	1,045,071	106,528	1,176,581	13,772	1,364,518	324,493	5,470,029	1,256,686
2035	834,712	1,037,848	1,048,890	102,194	1,181,500	12,383	1,369,437	325,034	5,522,894	1,264,553
<b>TOTAL</b>	<b>142,132,522</b>	<b>122,333,559</b>	<b>282,904,468</b>	<b>12,525,982</b>	<b>99,571,208</b>	<b>2,442,031</b>	<b>102,763,701</b>	<b>19,707,701</b>	<b>482,351,187</b>	<b>68,771,474</b>

(a) Unadjusted for prior overpayments or underpayments of charges.  
 (b) Determined at the current Project Interest Rate of 4.610 percent per annum.  
 (c) Reflects the transfers of permanent aqueduct capacity among contractors.

**TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor<sup>a b c</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	690,812	0	777,678	0	0	0	0	0	1,401,957
1964	21,735	1,260,513	9,378	1,603,161	0	0	0	0	0	2,551,416
1965	21,866	2,180,589	17,766	2,720,401	0	0	405	405	0	4,293,872
1966	37,964	3,900,172	33,426	4,868,023	0	0	565	565	0	6,808,355
1967	71,283	7,693,703	68,155	9,563,529	0	0	562	562	0	11,974,135
1968	120,094	14,345,147	133,299	17,534,105	0	0	564	564	0	21,170,040
1969	187,059	21,857,456	202,599	26,670,225	0	0	3,191	3,191	0	31,352,065
1970	275,010	28,992,595	257,859	35,656,010	0	0	15,121	15,121	0	40,621,833
1971	385,025	37,242,413	316,307	46,004,783	0	0	15,947	15,947	0	51,396,761
1972	448,055	44,062,125	353,935	54,012,583	0	0	17,332	17,332	0	60,563,434
1973	470,185	46,299,581	357,342	56,619,537	0	0	17,333	17,333	0	63,176,340
1974	483,259	48,322,678	372,112	58,892,336	0	0	17,334	17,334	0	65,975,854
1975	496,722	49,285,084	376,511	60,091,511	0	0	17,337	17,337	0	67,859,198
1976	509,650	50,137,295	380,788	61,140,760	0	0	17,338	17,338	0	69,000,454
1977	517,741	50,827,166	385,097	61,970,690	0	0	17,340	17,340	0	70,180,788
1978	522,656	51,426,581	390,742	62,675,723	0	0	17,342	17,342	0	71,392,562
1979	526,178	52,230,344	399,649	63,585,177	0	0	17,344	17,344	0	72,841,961
1980	529,583	53,637,412	417,136	65,133,031	0	0	17,345	17,345	0	74,888,560
1981	546,787	56,667,437	449,812	68,676,673	0	0	17,346	17,346	0	79,055,247
1982	545,445	57,465,063	461,234	69,478,655	0	0	17,348	17,348	0	80,345,261
1983	557,607	59,037,472	477,333	71,393,356	0	0	17,348	17,348	0	82,479,198
1984	575,830	60,313,580	486,863	73,091,656	0	0	17,349	17,349	0	84,992,959
1985	589,089	61,144,629	492,117	74,227,730	0	0	17,351	17,351	0	86,824,262
1986	598,648	61,666,346	494,977	74,962,798	0	0	17,352	17,352	0	88,675,565
1987	607,664	62,094,710	496,758	75,575,985	0	0	17,354	17,354	0	91,544,751
1988	614,418	62,452,912	498,619	76,064,714	0	0	17,355	17,355	0	93,646,292
1989	618,059	62,796,236	501,579	76,486,030	0	0	17,358	17,358	0	94,874,744
1990	629,934	63,762,459	509,566	77,744,640	0	0	17,360	17,360	0	96,617,389
1991	643,118	64,677,355	516,147	78,930,732	0	0	17,364	17,364	0	98,196,820
1992	660,626	65,776,353	523,154	80,358,214	0	0	17,367	17,367	0	99,929,612
1993	679,343	66,905,041	529,383	81,787,340	0	0	17,369	17,369	0	101,634,451
1994	714,062	68,486,622	535,055	83,792,916	0	0	17,370	17,370	0	104,408,263
1995	735,431	69,373,540	537,812	84,941,984	0	0	17,371	17,371	0	108,336,101
1996	753,512	70,251,056	541,753	86,062,060	0	0	17,371	17,371	0	118,300,162
1997	812,976	71,530,953	544,467	87,744,015	0	0	17,371	17,371	0	128,569,847
1998	919,464	72,283,436	548,490	89,376,405	0	0	0	0	0	132,279,938
1999	1,100,324	72,917,423	552,184	90,465,830	0	0	0	0	0	134,031,259
2000	1,434,718	73,432,162	555,279	92,918,575	0	0	0	0	0	136,634,542
2001	2,371,146	73,741,965	556,658	95,033,160	0	0	0	0	0	139,615,312
2002	3,744,046	73,915,736	557,417	97,810,953	0	0	0	0	0	142,554,234
2003	4,400,394	74,227,711	559,468	99,399,183	0	0	17,375	17,375	0	144,698,695
2004	4,668,372	74,463,765	559,218	100,193,702	0	0	17,375	17,375	0	145,918,744
2005	4,807,001	68,352,994	560,019	100,739,885	0	0	17,375	17,375	0	146,787,909
2006	4,856,806	68,688,724	562,234	101,301,934	0	0	17,375	17,375	0	147,502,280
2007	4,969,557	69,409,634	567,777	102,492,199	0	0	17,376	17,376	0	148,974,757
2008	5,104,050	70,015,898	571,889	103,576,170	0	0	17,376	17,376	0	150,520,284
2009	5,285,597	70,658,679	575,511	104,779,957	0	0	17,376	17,376	0	152,727,170
2010	5,566,492	71,884,880	583,594	107,262,595	0	0	17,377	17,377	0	155,928,829
2011	5,923,599	72,928,452	590,838	109,404,711	0	0	17,377	17,377	0	159,611,267
2012	6,372,403	73,646,192	594,531	111,320,155	0	0	17,377	17,377	0	162,917,094
2013	7,256,162	73,904,889	596,705	113,553,709	0	0	17,377	17,377	0	165,398,047
2014	10,089,166	74,709,956	592,108	120,058,169	0	0	17,377	17,377	0	172,134,659
2015	<b>10,097,637</b>	<b>75,610,681</b>	<b>591,051</b>	<b>121,584,749</b>	<b>0</b>	<b>0</b>	<b>16,972</b>	<b>16,972</b>	<b>0</b>	<b>174,020,505</b>
2016	10,093,789	76,556,152	581,338	123,331,038	0	0	16,813	16,813	0	175,595,249
2017	10,065,481	74,511,799	549,982	120,950,506	0	0	16,815	16,815	0	172,808,347
2018	10,016,669	68,992,891	484,839	114,210,122	0	0	16,813	16,813	0	165,408,509
2019	9,949,704	63,592,695	415,539	107,657,823	0	0	14,186	14,186	0	158,439,811
2020	9,861,753	57,796,529	360,278	99,964,562	0	0	2,256	2,256	0	150,571,513
2021	9,751,738	50,146,202	301,831	89,489,577	0	0	1,430	1,430	0	140,044,769
2022	9,688,708	44,270,808	264,202	81,407,994	0	0	45	45	0	131,937,319
2023	9,666,579	42,803,834	260,796	78,799,015	0	0	44	44	0	129,279,961
2024	9,653,505	40,900,322	246,025	76,510,944	0	0	43	43	0	126,976,565
2025	9,640,041	40,049,422	241,627	75,305,087	0	0	41	41	0	125,742,751
2026	9,627,113	39,301,697	237,350	74,248,486	0	0	39	39	0	124,665,431
2027	9,619,023	38,688,722	233,040	73,412,001	0	0	37	37	0	123,798,752
2028	9,614,107	38,125,032	227,395	72,697,905	0	0	35	35	0	123,039,968
2029	9,610,585	37,351,521	218,489	71,773,194	0	0	33	33	0	122,078,727
2030	9,607,181	35,967,966	201,002	70,195,043	0	0	32	32	0	120,450,929
2031	9,589,976	33,056,260	168,326	66,584,965	0	0	31	31	0	116,721,871
2032	9,591,319	32,251,667	156,904	65,768,800	0	0	29	29	0	115,888,862
2033	9,579,157	30,749,554	140,805	63,821,575	0	0	29	29	0	113,856,492
2034	9,560,933	29,572,552	131,275	62,098,606	0	0	28	28	0	111,933,055
2035	9,547,675	28,817,291	126,021	60,954,667	0	0	26	26	0	110,438,421
<b>TOTAL</b>	<b>299,808,588</b>	<b>3,857,089,525</b>	<b>28,890,765</b>	<b>5,521,292,711</b>	<b>0</b>	<b>0</b>	<b>781,795</b>	<b>781,795</b>	<b>0</b>	<b>7,797,813,336</b>

(a) Unadjusted for prior overpayments or underpayments of charges.  
 (b) Determined at the current Project Interest Rate of 4.610 percent per annum.  
 (c) Reflects the transfers of permanent aqueduct capacity among contractors.



**TABLE B-16A Minimum OMP&R Component of  
Transportation Charge for Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	9,699	8,868	21,132	39,699	0	0	0
1963	0	0	0	38,048	34,788	82,896	155,732	0	0	0
1964	0	0	0	41,148	38,323	91,320	170,791	0	0	0
1965	0	0	0	78,529	75,616	195,793	349,937	0	0	0
1966	0	0	0	79,753	78,779	218,543	377,076	0	0	0
1967	0	0	0	127,896	123,667	335,224	586,787	0	0	0
1968	130	0	130	126,058	120,563	333,506	580,128	11,800	21,770	33,571
1969	80,875	0	80,875	145,411	138,050	372,585	656,046	63,113	116,435	179,548
1970	94,872	0	94,872	128,993	120,245	320,664	569,902	74,187	136,867	211,054
1971	45,579	0	45,579	113,071	108,346	296,004	517,421	74,011	136,541	210,552
1972	37,895	0	37,895	122,407	117,483	334,366	574,256	79,196	146,107	225,303
1973	32,993	0	32,993	122,738	116,785	325,726	565,250	75,714	139,683	215,398
1974	46,498	0	46,498	154,435	146,929	403,080	704,444	76,530	141,189	217,719
1975	37,707	0	37,707	189,175	182,087	513,823	885,086	92,605	170,845	263,450
1976	60,786	0	60,786	203,064	193,435	524,813	921,312	94,935	175,144	270,079
1977	78,400	0	78,400	179,869	169,065	500,101	849,035	102,945	199,922	292,867
1978	56,318	0	56,318	239,301	228,855	647,828	1,115,984	104,060	191,978	296,038
1979	73,852	0	73,852	236,986	232,105	666,742	1,135,833	100,748	185,868	286,617
1980	81,769	0	81,769	389,575	372,185	1,010,830	1,772,591	126,328	233,105	359,433
1981	101,340	0	101,340	317,408	302,272	834,257	1,453,937	140,208	258,712	398,920
1982	191,987	0	191,987	386,742	369,633	1,098,844	1,855,219	142,045	262,101	404,146
1983	80,215	0	80,215	438,536	428,973	1,269,373	2,136,882	171,001	315,523	486,524
1984	106,485	0	106,485	591,243	565,721	1,817,629	2,974,593	201,768	372,284	574,052
1985	215,341	0	215,341	674,975	655,490	1,840,211	3,170,677	242,935	448,233	691,167
1986	203,704	0	203,704	613,273	583,077	1,784,056	2,980,407	233,000	429,904	662,905
1987	295,505	0	295,505	687,629	652,468	2,000,817	3,340,914	230,484	463,838	694,322
1988	312,677	(58)	312,619	676,847	655,274	1,910,092	3,242,213	258,807	561,030	819,837
1989	403,330	688,185	1,091,515	716,831	712,354	1,897,149	3,326,335	244,772	668,476	913,248
1990	658,942	674,944	1,333,886	782,589	780,305	2,129,966	3,692,860	310,222	677,025	987,247
1991	726,717	860,903	1,587,620	543,178	524,741	1,520,569	2,588,488	302,369	673,858	976,227
1992	483,580	712,313	1,195,893	796,058	855,050	2,253,496	3,904,605	346,220	736,477	1,082,698
1993	524,000	708,129	1,232,129	1,280,736	1,261,431	3,338,742	5,880,908	386,060	734,138	1,120,197
1994	573,814	658,274	1,232,087	1,368,665	1,312,746	3,560,310	6,241,720	481,022	888,287	1,369,309
1995	539,407	660,770	1,200,177	1,232,272	1,187,201	3,216,470	5,635,943	477,929	881,323	1,359,251
1996	604,992	1,011,298	1,616,291	1,185,220	1,124,968	3,007,330	5,317,518	649,161	1,197,179	1,846,340
1997	563,579	741,881	1,305,460	1,029,670	968,999	2,667,649	4,666,319	406,652	749,805	1,156,456
1998	461,844	661,193	1,123,037	1,064,729	1,174,897	3,502,733	5,742,360	810,087	3,051,492	3,861,579
1999	613,368	1,006,577	1,619,945	1,243,942	1,285,417	5,135,770	7,665,129	795,894	3,101,531	3,897,425
2000	775,742	1,492,734	2,268,475	2,173,249	1,294,794	3,752,323	7,220,366	702,795	3,169,914	3,872,709
2001	652,272	1,445,084	2,097,356	4,193,895	1,037,838	3,543,834	8,775,567	725,531	2,956,531	3,682,063
2002	1,096,983	1,871,225	2,968,209	8,256,079	1,355,833	6,054,691	15,666,603	758,301	3,357,079	4,115,381
2003	1,170,339	2,249,637	3,419,975	4,904,523	1,058,421	3,551,378	9,514,322	807,358	3,515,450	4,322,808
2004	1,619,993	2,348,074	3,968,067	2,578,572	1,278,531	3,533,247	7,390,350	804,309	3,449,944	4,254,253
2005	918,160	1,798,219	2,716,379	2,397,132	1,132,137	2,954,257	6,483,526	856,064	3,807,031	4,663,096
2006	844,277	1,417,680	2,261,957	2,473,364	1,198,790	3,267,321	6,939,475	759,044	3,769,943	4,528,987
2007	811,448	1,545,604	2,357,052	3,239,357	1,578,771	4,042,498	8,860,626	837,847	3,694,944	4,522,791
2008	1,100,201	1,469,773	2,569,974	3,652,890	1,782,721	4,540,690	9,976,302	1,260,876	5,454,843	6,715,719
2009	1,147,923	1,811,973	2,959,897	3,259,124	1,479,023	4,197,881	8,936,028	1,090,302	4,586,773	5,677,075
2010	1,237,627	3,226,898	4,464,526	3,173,830	1,558,108	4,301,598	9,033,536	1,426,813	6,348,229	7,775,042
2011	1,592,590	3,641,509	5,234,099	3,522,095	1,703,913	4,563,768	9,789,777	1,457,071	6,657,397	8,114,468
2012	2,027,809	3,410,169	5,437,978	3,730,922	1,786,985	6,801,134	12,319,041	1,465,008	7,409,045	8,874,054
2013	1,516,336	3,056,946	4,573,282	4,308,652	2,023,320	6,048,937	12,380,910	1,835,773	9,750,934	11,586,707
2014	1,970,448	4,113,687	6,084,134	4,606,555	2,111,413	6,133,672	12,851,639	2,141,944	9,803,068	11,945,012
<b>2015</b>	<b>2,086,057</b>	<b>4,327,087</b>	<b>6,413,144</b>	<b>5,075,009</b>	<b>2,391,487</b>	<b>8,445,075</b>	<b>15,911,571</b>	<b>1,916,840</b>	<b>9,313,790</b>	<b>11,230,630</b>
2016	2,080,705	4,287,649	6,368,354	5,217,757	2,474,365	9,213,944	16,906,067	1,977,919	9,688,236	11,666,155
2017	2,038,295	4,239,334	6,277,629	4,938,612	2,308,644	7,914,091	15,161,348	2,008,328	9,653,997	11,662,325
2018	2,058,679	4,281,729	6,340,407	4,987,998	2,331,731	7,993,231	15,312,960	2,028,411	9,750,536	11,778,948
2019	2,079,266	4,324,546	6,403,812	5,037,878	2,355,048	8,073,163	15,466,089	2,048,695	9,848,042	11,896,737
2020	2,100,055	4,367,846	6,467,841	5,088,234	2,378,598	8,153,895	15,620,727	2,069,182	9,946,522	12,015,704
2021	2,121,056	4,411,464	6,532,520	5,139,115	2,402,384	8,235,434	15,776,934	2,089,874	10,045,987	12,135,862
2022	2,142,267	4,455,579	6,597,846	5,190,506	2,426,408	8,317,788	15,934,702	2,110,773	10,146,447	12,257,220
2023	2,163,689	4,500,134	6,663,823	5,242,411	2,450,672	8,400,966	16,094,050	2,131,881	10,247,911	12,379,792
2024	2,185,326	4,545,137	6,730,463	5,294,835	2,475,178	8,484,975	16,254,989	2,153,199	10,350,391	12,503,590
2025	2,207,180	4,590,587	6,797,767	5,347,874	2,499,930	8,569,826	16,417,541	2,174,732	10,453,895	12,628,626
2026	2,229,251	4,636,493	6,865,744	5,401,262	2,524,930	8,655,524	16,581,715	2,196,479	10,558,434	12,754,912
2027	2,251,544	4,682,858	6,934,401	5,455,274	2,550,179	8,742,078	16,747,532	2,218,444	10,664,018	12,882,462
2028	2,274,059	4,729,687	7,003,746	5,509,827	2,575,681	8,829,501	16,915,009	2,240,628	10,770,658	13,011,286
2029	2,296,800	4,776,983	7,073,783	5,564,926	2,601,438	8,917,796	17,084,159	2,263,034	10,878,365	13,141,399
2030	2,319,767	4,824,753	7,144,520	5,620,575	2,627,452	9,006,973	17,255,000	2,285,665	10,987,148	13,272,813
2031	2,342,966	4,873,000	7,215,966	5,676,780	2,653,727	9,097,043	17,427,550	2,308,521	11,097,020	13,405,541
2032	2,366,395	4,921,731	7,288,125	5,733,549	2,680,264	9,188,013	17,601,825	2,331,607	11,207,990	13,539,596
2033	2,390,059	4,970,948	7,361,007	5,790,884	2,707,066	9,279,894	17,777,845	2,354,923	11,320,070	13,674,993
2034	2,413,959	5,020,657	7,434,617	5,848,793	2,734,137	9,372,693	17,955,622	2,378,472	11,433,270	13,811,742
2035	2,438,099	5,070,864	7,508,963	5,907,281	2,761,478	9,466,419	18,135,178	2,402,257	11,547,604	13,949,860
<b>TOTAL</b>	<b>73,456,124</b>	<b>140,122,627</b>	<b>213,578,750</b>	<b>187,896,234</b>	<b>93,298,587</b>	<b>301,625,993</b>	<b>582,820,814</b>	<b>70,525,708</b>	<b>316,098,129</b>	<b>386,623,837</b>

**TABLE B-16A Minimum OMP&R Component of  
Transportation Charge for Each Contractor**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total	
				Municipal and Industrial	Agricultural					
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	
1961	0	0	0	0	0	0	0	0	0	
1962	0	0	0	0	0	0	0	0	0	
1963	0	0	0	0	0	0	0	0	0	
1964	0	0	0	0	0	0	0	0	0	
1965	0	0	0	0	0	0	0	0	0	
1966	0	0	0	0	0	0	0	0	0	
1967	0	0	0	0	0	0	0	0	0	
1968	37,806	1,963	5,639	60,701	678,086	2,008	2,073	77,591	865,867	
1969	45,479	2,235	30,158	80,554	1,197,126	2,286	2,085	90,773	1,450,698	
1970	46,969	2,292	35,450	96,673	1,381,493	2,344	2,158	93,408	1,660,786	
1971	47,997	2,314	35,366	106,654	1,643,163	2,366	2,288	94,874	1,935,021	
1972	49,866	2,414	37,844	122,313	1,729,169	2,469	2,254	98,777	2,045,106	
1973	50,006	2,385	36,180	125,553	1,719,873	2,440	2,310	98,330	2,037,076	
1974	52,818	2,556	36,570	135,661	1,823,065	2,614	2,529	104,609	2,160,424	
1975	66,963	3,243	44,251	162,738	2,235,242	3,317	3,191	132,663	2,651,608	
1976	66,504	3,328	45,364	159,303	2,215,999	3,404	2,919	133,940	2,630,761	
1977	75,595	3,812	49,192	189,661	2,522,290	3,898	3,708	152,838	3,000,994	
1978	70,688	3,503	49,725	174,897	2,427,163	3,583	3,644	141,672	2,874,875	
1979	68,879	3,436	48,142	173,677	2,378,315	3,514	3,492	138,493	2,817,948	
1980	95,898	4,722	59,551	235,741	3,146,570	4,830	4,777	191,582	3,743,671	
1981	118,448	5,965	66,183	266,353	3,440,557	6,099	5,187	239,323	4,148,116	
1982	134,083	6,711	67,061	311,879	3,848,922	6,862	6,382	270,061	4,651,960	
1983	184,902	9,242	80,869	426,485	5,030,031	9,450	8,494	372,182	6,121,656	
1984	194,228	9,656	95,555	471,854	5,636,134	9,874	8,719	389,892	6,815,912	
1985	200,694	9,957	115,227	486,162	6,042,593	10,182	8,982	402,457	7,276,254	
1986	207,028	10,302	110,479	530,803	6,372,710	10,536	10,341	415,776	7,667,975	
1987	205,002	10,259	109,401	533,451	6,378,437	10,493	10,517	412,889	7,670,450	
1988	203,711	10,223	122,903	516,432	6,388,497	10,455	10,341	410,868	7,673,430	
1989	224,049	11,269	116,197	564,169	6,747,046	11,526	11,102	452,406	8,137,763	
1990	271,051	13,666	148,238	664,040	8,111,616	13,976	13,206	547,974	9,783,767	
1991	275,748	13,854	144,486	662,755	8,111,610	14,168	13,218	556,474	9,792,313	
1992	317,889	16,027	162,466	764,224	9,115,453	16,393	18,209	642,672	11,053,333	
1993	359,879	17,989	184,477	831,662	10,372,245	18,399	19,560	724,397	12,528,608	
1994	309,084	15,486	224,254	738,619	9,789,833	15,839	16,434	622,879	11,732,427	
1995	395,441	19,918	220,899	898,339	11,190,121	20,373	21,551	799,070	13,565,713	
1996	362,623	19,968	301,835	902,162	11,872,821	20,424	21,664	796,711	14,298,209	
1997	366,476	20,154	186,450	942,987	10,558,144	20,613	19,344	806,084	12,920,252	
1998	453,033	24,560	288,906	1,098,213	12,207,220	25,122	21,594	995,194	15,114,543	
1999	384,169	21,168	275,698	980,700	11,106,789	21,650	21,913	844,306	13,656,391	
2000	383,321	21,079	206,873	1,019,807	9,928,805	21,559	22,683	841,482	12,445,608	
2001	463,222	25,484	231,715	1,210,447	11,258,522	26,063	31,723	1,017,239	14,264,415	
2002	425,392	21,528	223,874	1,078,842	10,216,835	22,018	25,550	812,053	12,826,093	
2003	494,491	25,186	242,454	1,177,195	11,270,414	25,761	30,665	944,127	14,210,293	
2004	441,879	22,625	244,833	1,123,550	10,642,168	61,644	25,373	731,339	13,293,410	
2005	426,992	21,913	257,856	1,012,715	10,314,810	59,616	24,277	707,652	12,825,830	
2006	466,571	23,852	196,995	1,114,906	10,382,665	72,011	26,372	768,950	13,052,322	
2007	528,504	26,797	234,731	1,272,246	11,711,842	82,643	27,201	866,563	14,750,528	
2008	631,880	32,568	370,911	1,538,520	15,194,026	102,337	32,798	1,046,861	18,949,901	
2009	516,642	26,259	334,876	1,268,779	12,752,687	84,120	26,826	848,413	15,856,602	
2010	512,955	29,802	410,825	1,341,249	13,408,724	96,456	28,634	890,302	16,718,947	
2011	593,356	34,725	403,148	1,628,671	15,402,750	110,096	39,654	1,034,984	19,247,383	
2012	558,575	32,539	364,391	1,601,786	15,199,164	102,153	30,694	971,258	18,860,561	
2013	695,004	40,706	436,761	1,847,484	17,923,779	126,005	34,999	1,212,949	22,317,688	
2014	757,087	46,079	615,778	2,031,447	21,021,452	147,040	43,576	1,351,244	26,013,704	
<b>2015</b>	<b>839,096</b>	<b>49,511</b>	<b>513,224</b>	<b>2,180,313</b>	<b>22,637,738</b>	<b>153,106</b>	<b>49,351</b>	<b>1,453,541</b>	<b>27,875,879</b>	
2016	809,428	47,783	524,681	2,123,484	22,259,220	148,754	47,648	1,402,614	27,363,612	
2017	816,931	48,269	556,740	2,056,778	22,501,853	151,129	47,327	1,416,491	27,595,518	
2018	825,101	48,752	562,307	2,077,346	22,726,871	152,641	47,800	1,430,656	27,871,474	
2019	833,352	49,239	567,931	2,098,119	22,954,141	154,167	48,278	1,444,963	28,150,189	
2020	773,955	49,732	573,611	2,118,429	23,178,452	155,710	48,761	1,459,412	28,358,061	
2021	781,694	50,229	579,347	2,139,613	23,410,236	157,267	49,248	1,474,006	28,641,641	
2022	789,511	50,731	585,140	2,161,009	23,644,339	158,840	49,741	1,488,746	28,928,058	
2023	797,406	51,239	590,992	2,182,619	23,880,782	160,428	50,238	1,503,634	29,217,338	
2024	805,381	51,751	596,901	2,204,445	24,119,590	162,032	50,741	1,518,670	29,509,512	
2025	813,434	52,268	602,871	2,226,490	24,360,786	163,653	51,248	1,533,857	29,804,607	
2026	821,569	52,791	608,899	2,248,755	24,604,394	165,289	51,761	1,549,196	30,102,653	
2027	829,784	53,319	614,988	2,271,242	24,850,438	166,942	52,278	1,564,688	30,403,680	
2028	838,082	53,852	621,138	2,293,955	25,098,942	168,611	52,801	1,580,334	30,707,716	
2029	846,463	54,391	627,349	2,316,894	25,349,931	170,297	53,329	1,596,138	31,014,793	
2030	854,928	54,935	633,623	2,340,063	25,603,431	172,000	53,862	1,612,099	31,324,941	
2031	863,477	55,484	639,959	2,363,464	25,859,465	173,720	54,401	1,628,220	31,638,191	
2032	872,112	56,039	646,359	2,387,098	26,118,059	175,458	54,945	1,644,502	31,954,572	
2033	880,833	56,599	652,822	2,410,969	26,379,240	177,212	55,494	1,660,947	32,274,118	
2034	889,641	57,165	659,351	2,435,079	26,643,033	178,984	56,049	1,677,557	32,596,859	
2035	898,538	57,737	665,944	2,459,430	26,909,463	180,774	56,610	1,694,332	32,922,828	
<b>TOTAL</b>	<b>31,319,591</b>	<b>1,837,538</b>	<b>20,935,216</b>	<b>81,778,655</b>	<b>887,138,082</b>	<b>4,898,042</b>	<b>1,837,122</b>	<b>58,631,182</b>	<b>1,088,375,429</b>	

**TABLE B-16A Minimum OMP&R Component of Transportation Charge for Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Little Rock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	65,074	28,085	11,697	2,958	19,291	1,089	24,380	8,173	52,315	14,399
1969	86,339	70,342	15,522	3,925	25,598	1,445	32,348	10,844	69,419	19,106
1970	107,807	84,577	19,392	4,904	31,981	1,804	40,391	13,540	86,727	23,865
1971	178,820	105,979	32,228	8,150	53,151	2,992	66,999	22,459	144,136	39,636
1972	363,555	202,625	106,740	30,967	176,037	6,601	213,032	48,102	548,123	144,113
1973	404,661	222,765	121,341	34,674	200,116	7,346	243,320	53,975	724,535	190,156
1974	434,868	235,528	130,627	37,062	215,432	7,677	262,735	56,383	786,107	207,019
1975	504,791	269,501	151,031	43,176	249,082	9,082	303,108	65,580	905,424	238,842
1976	559,013	262,420	160,686	44,454	265,004	10,030	325,512	73,253	964,524	256,570
1977	675,504	335,749	184,813	47,743	304,792	11,890	381,161	87,355	1,069,446	289,793
1978	600,343	376,946	187,028	54,156	308,449	10,711	373,192	78,304	1,148,279	300,751
1979	661,123	349,072	196,264	52,211	323,677	12,124	401,469	87,126	1,125,452	302,508
1980	858,039	415,571	253,090	71,921	417,398	15,435	508,379	112,853	1,518,405	401,223
1981	1,001,503	511,087	284,970	73,534	469,970	18,046	588,024	131,992	1,548,350	420,523
1982	1,128,643	557,494	320,938	89,560	529,292	20,193	649,204	148,012	1,870,559	497,871
1983	1,744,932	832,687	450,049	119,275	742,218	30,643	922,072	225,793	2,373,149	639,682
1984	2,105,780	943,524	548,784	150,179	905,055	36,810	1,112,196	271,187	3,018,294	803,394
1985	2,157,936	1,055,744	584,697	157,841	964,282	38,972	1,191,309	277,250	3,230,403	860,780
1986	2,311,841	1,102,466	618,750	162,748	1,020,438	40,051	1,268,806	295,987	3,318,638	893,069
1987	2,366,343	1,032,918	628,222	167,262	1,036,061	41,773	1,283,836	307,844	3,400,838	913,933
1988	2,303,274	1,042,113	649,276	175,694	1,070,784	40,604	1,321,553	298,438	3,587,873	960,968
1989	2,280,051	1,088,176	613,266	169,993	1,011,401	39,501	1,240,888	292,775	3,499,964	932,519
1990	2,636,186	1,275,150	708,829	201,242	1,169,006	45,472	1,424,445	336,069	4,084,211	1,078,392
1991	2,737,441	1,454,172	763,989	210,644	1,259,974	48,936	1,546,583	358,165	4,348,900	1,150,633
1992	2,781,586	1,579,025	750,248	198,232	1,237,307	49,829	1,538,733	362,844	4,131,745	1,115,632
1993	3,109,819	1,689,775	850,589	234,719	1,402,796	56,125	1,722,415	411,539	5,023,595	1,338,111
1994	2,825,193	1,608,731	794,991	225,121	1,311,100	51,259	1,634,886	376,180	4,794,820	1,267,565
1995	3,121,440	1,720,649	848,101	231,718	1,398,686	58,749	1,766,297	444,998	4,828,432	1,272,346
1996	3,093,678	1,966,634	862,720	228,008	1,422,789	56,813	1,817,427	423,444	4,707,473	1,256,549
1997	3,250,394	1,810,292	918,428	281,067	1,514,687	59,547	1,853,224	446,127	5,705,741	1,477,757
1998	3,876,512	2,050,254	1,070,517	299,639	1,765,491	73,835	3,207,848	561,246	6,076,375	1,634,942
1999	3,832,428	2,108,765	1,114,208	311,154	1,837,547	75,908	3,226,793	549,879	6,454,799	1,738,148
2000	3,748,188	3,377,095	1,035,299	291,623	1,707,415	68,346	2,998,591	594,004	5,874,561	1,571,594
2001	4,463,528	3,773,107	1,111,746	298,092	1,833,474	80,939	3,287,848	700,578	5,756,037	1,555,520
2002	3,639,084	3,495,400	1,017,572	282,349	1,678,180	62,548	2,999,433	549,355	5,629,064	1,510,466
2003	4,069,896	3,395,569	1,124,273	298,713	1,854,138	68,092	3,297,627	608,992	6,605,129	1,605,505
2004	4,449,076	4,036,815	1,443,531	323,353	1,911,254	76,869	3,430,198	677,499	7,230,993	1,767,454
2005	3,840,359	3,554,688	5,908,558	289,941	2,251,906	66,939	2,915,476	582,582	6,813,490	1,603,277
2006	4,101,568	3,262,587	8,465,275	309,798	2,825,644	75,037	3,165,374	643,322	7,017,463	1,698,707
2007	4,499,061	4,417,507	8,701,627	330,623	2,920,806	79,088	3,353,296	685,251	8,099,054	1,904,806
2008	4,968,759	5,334,984	9,828,820	375,734	3,328,060	82,776	4,137,546	752,722	9,335,976	2,058,149
2009	4,577,795	4,495,073	8,725,496	356,944	3,008,102	78,173	3,725,860	693,121	8,976,616	1,996,243
2010	4,186,562	4,344,598	9,424,067	368,205	3,240,568	73,891	3,808,808	627,294	8,988,989	1,999,768
2011	4,905,254	4,736,368	10,817,881	416,801	3,669,668	86,160	4,344,908	765,572	9,485,546	2,183,025
2012	5,531,329	5,257,047	11,533,133	465,183	4,007,222	98,926	4,650,778	848,810	10,835,065	2,411,888
2013	6,849,544	6,454,699	12,745,335	530,204	4,609,333	120,484	5,579,996	1,047,413	12,318,780	2,836,832
2014	6,956,572	6,452,547	14,090,974	556,646	4,999,596	119,164	6,182,771	1,052,931	13,186,486	3,060,558
<b>2015</b>	<b>7,465,163</b>	<b>6,651,819</b>	<b>14,364,778</b>	<b>575,954</b>	<b>5,088,436</b>	<b>125,627</b>	<b>6,226,379</b>	<b>1,102,304</b>	<b>13,690,867</b>	<b>3,124,006</b>
2016	7,060,572	6,580,594	14,300,180	568,901	5,021,665	119,603	6,132,069	1,052,197	13,716,086	3,106,791
2017	7,091,840	6,534,861	14,393,168	567,206	5,086,389	122,657	6,197,466	1,059,167	13,566,829	3,127,811
2018	7,162,758	6,600,210	14,537,100	572,878	5,137,253	123,884	6,259,441	1,069,759	13,702,497	3,159,089
2019	7,234,386	6,666,212	14,682,471	578,607	5,188,626	125,122	6,322,036	1,080,457	13,839,523	3,190,680
2020	7,301,382	6,729,191	14,823,921	584,163	5,238,322	126,286	6,557,685	1,090,472	13,973,804	3,221,453
2021	7,374,395	6,796,483	14,972,160	590,004	5,290,705	127,548	6,623,262	1,101,377	14,113,543	3,253,668
2022	7,448,139	6,864,448	15,121,882	595,904	5,343,612	128,824	6,689,495	1,112,391	14,254,678	3,286,204
2023	7,522,621	6,933,092	15,273,101	601,863	5,397,048	130,112	6,756,390	1,123,515	14,397,226	3,319,066
2024	7,597,847	7,002,423	15,425,832	607,882	5,451,019	131,413	6,823,953	1,134,750	14,541,197	3,352,257
2025	7,673,825	7,072,448	15,580,090	613,961	5,505,529	132,727	6,892,193	1,146,097	14,686,609	3,385,780
2026	7,750,564	7,143,172	15,735,891	620,101	5,560,584	134,055	6,961,115	1,157,558	14,833,475	3,419,637
2027	7,828,069	7,214,604	15,893,250	626,302	5,616,190	135,395	7,030,726	1,169,134	14,981,810	3,453,834
2028	7,906,350	7,286,750	16,052,183	632,564	5,672,352	136,749	7,101,033	1,180,825	15,131,629	3,488,372
2029	7,985,414	7,359,617	16,212,704	638,890	5,729,076	138,117	7,172,044	1,192,634	15,282,945	3,523,256
2030	8,065,268	7,433,213	16,374,831	645,279	5,786,366	139,498	7,243,764	1,204,560	15,435,774	3,558,478
2031	8,145,920	7,507,546	16,538,580	651,732	5,844,230	140,893	7,316,202	1,216,606	15,590,132	3,594,073
2032	8,227,380	7,582,621	16,703,965	658,249	5,902,672	142,302	7,389,364	1,228,772	15,746,033	3,630,014
2033	8,309,653	7,658,447	16,871,005	664,832	5,961,699	143,725	7,463,257	1,241,059	15,903,493	3,666,314
2034	8,392,750	7,735,032	17,039,715	671,480	6,021,316	145,162	7,537,890	1,253,470	16,062,530	3,702,977
2035	8,476,677	7,812,382	17,210,112	678,195	6,081,529	146,614	7,613,269	1,266,005	16,223,154	3,740,007
<b>TOTAL</b>	<b>286,972,463</b>	<b>243,962,067</b>	<b>449,032,535</b>	<b>22,563,089</b>	<b>184,428,881</b>	<b>5,015,035</b>	<b>234,680,104</b>	<b>42,250,268</b>	<b>520,974,134</b>	<b>123,748,561</b>

**TABLE B-16A Minimum OMP&R Component of  
Transportation Charge for Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	42,918
1963	0	0	0	0	0	0	0	0	12,626	168,358
1964	0	0	0	0	0	0	0	0	13,938	184,729
1965	0	0	0	0	0	0	0	0	28,937	378,874
1966	0	0	0	0	0	0	0	0	31,321	408,397
1967	0	0	0	0	0	0	0	0	47,718	634,505
1968	8,821	972,734	9,504	1,218,520	0	0	0	0	46,945	2,745,160
1969	11,704	1,295,607	12,610	1,654,810	0	0	0	0	52,963	4,074,939
1970	14,623	1,624,569	15,746	2,069,923	0	0	0	0	69,744	4,676,282
1971	24,302	2,716,584	26,118	3,421,555	0	0	54	54	55,532	6,185,714
1972	89,131	8,038,463	68,369	10,035,857	0	0	40	40	80,412	12,998,869
1973	117,779	9,890,316	78,313	12,289,296	0	0	1	1	54,219	15,194,233
1974	128,169	11,581,491	83,453	14,166,551	0	0	143	143	76,783	17,372,561
1975	147,899	13,584,548	101,893	16,593,957	0	0	1,069	1,069	84,547	20,517,423
1976	158,664	12,862,489	94,799	16,037,419	0	0	139	139	106,717	20,027,213
1977	178,774	16,203,699	121,966	19,892,683	0	0	892	892	98,618	24,213,489
1978	186,384	17,811,770	132,435	21,568,747	0	0	39	39	100,786	26,012,786
1979	186,688	16,414,289	126,756	20,238,761	0	0	3,235	3,235	119,352	24,675,598
1980	248,399	20,926,898	154,096	25,901,706	0	0	416	416	178,812	32,038,398
1981	259,244	23,731,024	186,592	29,224,860	0	0	3,847	3,847	185,347	35,516,366
1982	307,955	27,994,510	209,141	34,323,374	0	0	11,075	11,075	173,894	41,611,655
1983	394,524	38,953,367	326,258	47,754,649	0	0	1,928	1,928	220,926	56,802,781
1984	496,808	45,597,671	382,104	56,371,786	0	0	3,765	3,765	225,959	67,072,552
1985	531,765	50,064,444	416,652	61,532,075	0	0	2,888	2,888	340,322	73,228,724
1986	551,066	52,858,915	442,334	64,885,109	0	0	2,787	2,787	279,227	76,682,113
1987	564,352	50,737,631	411,276	62,892,287	0	0	2,388	2,388	345,116	75,240,981
1988	593,787	51,262,231	406,248	63,712,844	0	0	545	545	365,207	76,126,695
1989	576,852	52,638,942	431,020	64,815,349	0	0	1,800	1,800	422,329	78,708,338
1990	667,687	61,053,824	494,721	75,175,234	0	0	788	788	474,284	91,448,066
1991	711,803	60,874,529	470,139	75,935,908	0	0	3,654	3,654	214,683	91,098,893
1992	688,558	67,460,598	502,131	82,396,469	0	0	647	647	443,676	100,077,320
1993	828,208	68,749,547	538,751	85,955,990	0	0	3,630	3,630	599,571	107,321,034
1994	783,691	63,898,029	473,897	80,045,461	0	0	2,279	2,279	609,966	101,233,250
1995	785,191	68,079,888	523,512	85,080,005	0	0	2,906	2,906	534,971	107,378,966
1996	773,653	72,757,439	561,100	89,927,727	0	0	8,007	8,007	571,857	113,585,948
1997	917,372	75,655,465	564,455	94,454,555	0	0	7,449	7,449	428,638	114,939,131
1998	1,000,558	80,540,695	608,294	102,766,204	0	0	0	0	465,095	129,072,817
1999	1,066,898	86,320,578	637,626	109,274,730	0	0	0	0	584,116	136,697,736
2000	964,285	82,387,903	634,908	105,253,813	0	0	0	0	0	131,060,971
2001	949,494	92,981,676	709,078	117,501,317	0	0	0	0	0	146,320,718
2002	922,428	85,410,289	657,383	107,853,552	0	0	0	0	0	143,429,837
2003	1,515,719	82,434,882	621,843	107,500,378	0	0	3,393	3,393	0	138,971,170
2004	1,437,179	99,642,794	762,432	127,189,449	0	0	3,455	3,455	0	156,098,984
2005	1,589,231	74,328,686	653,423	104,398,556	0	0	3,452	3,452	0	131,090,838
2006	1,448,696	76,971,802	605,998	110,591,271	0	0	3,867	3,867	0	137,377,879
2007	1,819,161	105,964,051	869,940	143,644,270	0	0	3,515	3,515	0	174,148,783
2008	2,464,750	114,899,619	992,275	158,560,170	0	0	4,991	4,991	0	196,777,058
2009	2,323,966	100,542,552	834,445	140,334,385	0	0	840	840	0	173,766,827
2010	2,517,502	99,600,994	800,298	139,981,544	0	0	1,060	1,060	0	177,974,654
2011	2,579,638	106,333,178	854,260	151,178,259	0	0	2,747	2,747	0	193,566,732
2012	2,573,186	121,400,718	979,157	170,592,443	0	0	1,141	1,141	0	216,085,218
2013	2,812,452	143,169,011	1,210,859	200,284,942	0	0	321	321	0	251,143,850
2014	3,166,142	142,067,107	1,142,520	203,034,016	0	0	153	153	0	259,928,658
<b>2015</b>	<b>3,394,867</b>	<b>149,771,172</b>	<b>1,218,490</b>	<b>212,799,861</b>	<b>0</b>	<b>0</b>	<b>175</b>	<b>175</b>	<b>0</b>	<b>274,231,259</b>
2016	3,444,211	148,328,434	1,200,753	210,632,057	0	0	183	183	0	272,936,427
2017	3,351,626	146,333,848	1,198,944	208,631,812	0	0	172	172	0	269,328,804
2018	3,385,143	147,797,186	1,210,933	210,718,130	0	0	173	173	0	272,022,092
2019	3,418,995	149,275,160	1,223,043	212,825,316	0	0	175	175	0	274,742,318
2020	3,452,494	150,693,534	1,234,521	215,027,228	0	0	177	177	0	277,489,739
2021	3,487,018	152,200,470	1,246,866	217,177,501	0	0	179	179	0	280,264,637
2022	3,521,889	153,722,475	1,259,335	219,349,276	0	0	180	180	0	283,067,282
2023	3,557,108	155,259,698	1,271,928	221,542,769	0	0	182	182	0	285,897,952
2024	3,592,678	156,812,296	1,284,648	223,758,195	0	0	184	184	0	288,756,932
2025	3,628,605	158,380,418	1,297,494	225,995,776	0	0	186	186	0	291,644,502
2026	3,664,892	159,964,222	1,310,469	228,255,735	0	0	188	188	0	294,560,947
2027	3,701,541	161,563,865	1,323,574	230,538,293	0	0	190	190	0	297,506,557
2028	3,738,556	163,179,504	1,336,809	232,843,678	0	0	192	192	0	300,481,626
2029	3,775,942	164,811,296	1,350,178	235,172,110	0	0	193	193	0	303,486,438
2030	3,813,701	166,459,411	1,363,679	237,523,834	0	0	195	195	0	306,521,303
2031	3,851,838	168,124,007	1,377,316	239,899,074	0	0	197	197	0	309,586,519
2032	3,890,356	169,805,246	1,391,089	242,298,063	0	0	199	199	0	312,682,381
2033	3,929,259	171,503,298	1,405,000	244,721,043	0	0	201	201	0	315,809,207
2034	3,968,552	173,218,331	1,419,050	247,168,255	0	0	203	203	0	318,967,298
2035	4,008,238	174,950,515	1,433,241	249,639,937	0	0	205	205	0	322,156,972
<b>TOTAL</b>	<b>119,662,645</b>	<b>6,103,442,432</b>	<b>49,298,493</b>	<b>8,386,030,706</b>	<b>0</b>	<b>0</b>	<b>99,275</b>	<b>99,275</b>	<b>8,748,370</b>	<b>10,666,277,181</b>

**TABLE B-16B Minimum OMP&R Component of Transportation Charge  
for Each Contractor for Off-Aqueduct Power Facilities <sup>a b</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	10,070	0	10,070	47,473	31,446	863,937	942,856	0	0	0
1984	29,957	0	29,957	157,280	77,388	2,040,188	2,274,856	0	0	0
1985	54,709	0	54,709	458,427	582,679	2,696,450	3,737,556	0	0	0
1986	45,887	0	45,887	312,938	365,147	2,595,765	3,273,850	0	0	0
1987	90,385	0	90,385	622,029	674,111	2,306,079	3,602,219	0	0	0
1988	115,970	114,196	230,166	616,865	804,606	2,116,236	3,537,707	0	0	0
1989	64,584	138,240	202,824	407,353	396,069	1,389,347	2,192,769	0	0	0
1990	77,126	138,805	215,931	535,269	514,372	1,490,250	2,539,891	0	0	0
1991	35,178	245,181	280,359	355,578	477,883	1,065,488	1,898,949	0	165,930	165,930
1992	74,573	230,716	305,289	405,244	529,119	1,183,466	2,117,829	0	0	0
1993	89,214	247,977	337,191	841,383	256,930	1,552,562	2,650,875	0	0	0
1994	111,942	229,598	341,540	501,812	559,683	1,395,238	2,456,733	0	0	0
1995	96,842	235,605	332,447	833,227	492,578	796,524	2,122,329	0	0	0
1996	63,698	205,414	269,112	367,297	304,845	1,189,291	1,861,433	711	105	816
1997	48,518	193,255	241,773	455,751	294,951	1,220,497	1,971,199	44,788	298,986	343,774
1998	82,317	251,217	333,534	380,321	380,282	1,103,662	1,864,265	198,376	1,028,220	1,226,596
1999	58,017	195,562	253,579	559,900	446,655	1,039,572	2,046,127	147,204	791,946	939,150
2000	28,759	128,393	157,152	374,808	237,138	748,820	1,360,766	82,628	474,268	556,896
2001	81,666	157,196	238,862	396,340	233,205	673,431	1,302,976	134,574	595,294	729,868
2002	40,236	127,750	167,986	383,365	229,280	519,819	1,132,464	91,639	583,933	675,572
2003	37,618	92,735	130,353	301,657	180,804	643,729	1,126,190	78,771	477,048	555,819
2004	50,289	128,180	178,469	447,802	210,093	546,342	1,204,237	92,836	662,110	754,946
2005	53,455	149,328	202,783	452,896	265,252	772,420	1,490,568	106,901	587,036	693,937
2006	59,239	127,708	186,947	476,295	277,304	798,098	1,551,697	109,498	605,502	715,000
2007	82,724	182,954	265,678	445,250	246,862	740,211	1,432,323	103,331	759,114	862,445
2008	200,185	304,502	504,687	861,568	428,737	1,074,975	2,365,280	184,501	997,507	1,182,008
2009	167,186	237,569	404,754	708,409	418,456	1,279,442	2,406,307	209,684	853,143	1,062,827
2010	186,503	221,486	407,989	876,092	407,548	1,266,270	2,549,910	203,422	963,122	1,166,544
2011	121,673	145,499	267,172	685,604	372,699	1,174,038	2,232,341	147,645	829,034	976,678
2012	130,199	185,005	315,203	830,163	319,227	1,135,648	2,285,038	186,059	920,215	1,106,274
2013	115,126	174,866	289,992	613,548	332,291	1,063,136	2,008,975	121,942	608,997	730,939
2014	102,045	119,184	221,229	411,555	236,398	826,518	1,474,471	168,521	421,143	589,664
<b>2015</b>	<b>30,511</b>	<b>37,372</b>	<b>67,883</b>	<b>141,320</b>	<b>87,374</b>	<b>263,478</b>	<b>492,172</b>	<b>69,951</b>	<b>174,747</b>	<b>244,698</b>
2016	18,497	15,998	34,495	76,150	37,892	107,730	221,772	51,860	104,224	156,083
2017	18,142	15,691	33,834	74,689	37,165	105,663	217,518	50,865	102,224	153,089
2018	7,300	6,314	13,614	30,054	14,955	42,518	87,528	20,468	41,134	61,602
2019	7,314	6,351	13,665	30,112	15,688	37,351	83,151	18,684	41,213	59,898
2020	7,937	6,891	14,828	32,674	17,022	40,529	90,226	20,274	44,720	64,994
2021	11,591	10,064	21,654	47,717	24,859	59,189	131,765	29,608	65,308	94,916
2022	10,973	9,527	20,500	45,175	23,535	56,035	124,745	28,030	61,829	89,859
2023	8,049	6,989	15,038	33,138	17,264	41,104	91,506	20,562	45,354	65,916
2024	6,016	5,224	11,240	24,768	12,903	30,722	68,393	15,368	33,899	49,267
2025	985	855	1,839	4,053	2,112	5,028	11,193	2,515	5,548	8,063
2026	1,235	1,072	2,307	5,083	2,648	6,305	14,035	3,154	6,956	10,110
2027	1,837	1,595	3,432	7,563	3,940	9,381	20,885	4,693	10,351	15,044
2028	1,274	1,106	2,381	5,246	2,733	6,508	14,488	3,255	7,181	10,436
2029	1,268	1,101	2,369	5,220	2,720	6,475	14,415	3,239	7,145	10,384
2030	380	330	710	1,565	815	1,941	4,321	971	2,142	3,112
2031	379	329	708	1,560	813	1,936	4,309	968	2,136	3,104
2032	389	338	726	1,600	834	1,985	4,419	993	2,190	3,183
2033	386	335	720	1,587	827	1,969	4,383	985	2,172	3,157
2034	382	331	713	1,572	819	1,949	4,340	975	2,151	3,126
2035	389	338	727	1,601	834	1,986	4,422	994	2,192	3,185
<b>TOTAL</b>	<b>2,741,123</b>	<b>5,036,270</b>	<b>7,777,393</b>	<b>16,695,948</b>	<b>11,891,789</b>	<b>40,137,233</b>	<b>68,724,970</b>	<b>2,761,442</b>	<b>13,387,468</b>	<b>16,148,910</b>

(a) 1983 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include both debt service and bond cover.

(b) 2009 through 2015 charges also include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.



**TABLE B-16B Minimum OMP&R Component of Transportation Charge  
for Each Contractor for Off-Aqueduct Power Facilities <sup>a b</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA							
	Dudley Ridge Water District	Empire West Side Irrigation District	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
			Municipal and Industrial	Agricultural				
			[11]	[12]				
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	159,191	0	34,366	2,964,185	13,174	9,673	3,733	3,184,322
1984	389,518	0	816,103	9,095,509	26,774	33,576	49,601	10,411,081
1985	527,952	59,322	1,053,957	11,978,046	38,810	42,297	1,253,257	14,953,641
1986	552,172	12,858	885,988	11,788,714	40,659	38,275	872,008	14,190,674
1987	450,941	24,936	1,192,388	10,448,063	39,134	37,538	911,938	13,104,938
1988	425,261	31,146	1,130,988	9,910,050	35,851	26,779	850,225	12,410,300
1989	331,852	17,226	607,908	7,400,983	22,959	24,306	754,007	9,159,241
1990	219,381	7,731	428,482	5,216,562	12,089	12,046	344,943	6,241,234
1991	13,048	3,111	570,942	146,276	0	1,354	30,685	765,416
1992	244,630	13,395	706,155	5,788,599	18,587	15,716	480,903	7,267,985
1993	471,706	25,543	1,202,455	11,405,212	37,276	36,803	1,159,908	14,338,903
1994	262,029	15,161	901,463	6,786,208	19,257	19,061	567,521	8,570,700
1995	626,214	16,830	1,486,494	12,489,555	41,275	36,377	1,051,178	15,747,923
1996	407,919	13,446	1,226,968	9,219,091	28,668	24,001	1,691,135	12,611,228
1997	423,144	(6)	794,476	7,471,645	(31)	22,025	137,304	8,848,557
1998	471,993	4,597	837,228	8,366,817	127	25,458	175,371	9,881,591
1999	360,554	19,182	874,948	7,723,883	24,159	20,065	1,749,925	10,772,716
2000	193,895	5,762	392,659	4,215,772	11,530	9,847	667,127	5,496,592
2001	200,485	6,563	113,854	2,948,087	7,528	11,821	287,409	3,575,747
2002	153,306	4,540	308,554	2,797,916	9,223	10,767	299,940	3,584,246
2003	125,188	3,901	301,142	2,626,386	10,030	7,904	287,531	3,362,082
2004	168,005	12,193	457,106	2,914,113	30,989	10,807	278,204	3,871,417
2005	315,142	14,807	358,007	5,609,958	76,490	11,047	540,681	6,926,132
2006	287,977	13,112	401,503	5,488,668	38,075	11,559	432,313	6,673,207
2007	189,684	8,758	242,253	3,662,405	24,280	10,224	365,975	4,503,579
2008	184,682	7,887	381,864	3,930,067	31,949	11,276	282,379	4,830,104
2009	181,200	8,817	63,082	4,518,839	28,827	11,595	314,621	5,126,982
2010	250,194	27,117	96,128	5,774,210	40,474	16,580	488,098	6,692,800
2011	362,592	11,506	290,168	7,797,111	39,939	11,233	338,448	8,850,998
2012	139,042	16,387	281,108	5,881,018	53,747	16,121	654,940	7,042,362
2013	178,736	9,388	258,332	4,167,007	25,842	11,879	300,991	4,952,175
2014	128,431	5,003	205,115	3,361,153	10,709	8,200	193,229	3,911,840
<b>2015</b>	<b>55,898</b>	<b>2,693</b>	<b>128,394</b>	<b>1,181,467</b>	<b>7,040</b>	<b>3,603</b>	<b>103,250</b>	<b>1,482,345</b>
2016	17,720	1,056	54,595	388,429	3,343	1,368	30,780	497,291
2017	17,380	1,035	53,548	380,978	3,279	1,342	30,189	487,751
2018	6,994	417	21,547	153,303	1,319	540	12,148	196,268
2019	6,031	417	22,399	153,174	1,322	541	12,373	196,258
2020	6,544	453	24,305	166,206	1,434	587	13,426	212,956
2021	9,557	661	35,495	242,726	2,095	857	19,607	310,998
2022	9,048	626	33,604	229,794	1,983	812	18,562	294,428
2023	6,637	459	24,650	168,564	1,455	595	13,616	215,977
2024	4,961	343	18,424	125,988	1,087	445	10,177	161,425
2025	812	56	3,015	20,618	178	73	1,666	26,418
2026	1,018	70	3,781	25,854	223	91	2,088	33,126
2027	1,515	105	5,626	38,472	332	136	3,108	49,293
2028	1,051	73	3,903	26,688	230	94	2,156	34,194
2029	1,046	72	3,883	26,555	229	94	2,145	34,024
2030	313	22	1,164	7,959	69	28	643	10,198
2031	313	22	1,161	7,937	68	28	641	10,170
2032	321	22	1,190	8,140	70	29	658	10,430
2033	318	22	1,181	8,074	70	29	652	10,344
2034	315	22	1,169	7,994	69	28	646	10,243
2035	321	22	1,191	8,146	70	29	658	10,437
<b>TOTAL</b>	<b>9,544,175</b>	<b>428,888</b>	<b>19,346,408</b>	<b>207,269,174</b>	<b>864,366</b>	<b>607,558</b>	<b>18,094,717</b>	<b>256,155,286</b>

(a) 1983 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include both debt service and bond cover.

(b) 2009 through 2015 charges also include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

**TABLE B-16B Minimum OMP&R Component of Transportation Charge  
for Each Contractor for Off-Aqueduct Power Facilities<sup>a b</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley- East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline- Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	1,083,881	411,247	565,798	35,432	894,572	1,250	0	233,134	28,548	693,074
1984	2,499,848	1,122,640	1,427,428	102,114	2,263,172	77	0	502,967	693,074	601,583
1985	3,749,257	1,572,025	2,032,672	170,137	3,230,451	0	157,601	884,188	884,188	601,583
1986	3,159,857	1,694,487	2,097,408	173,460	3,340,188	15,873	0	739,563	1,088,901	1,088,901
1987	3,167,759	1,694,698	1,991,841	190,149	3,230,424	95,994	1,786	1,951,799	1,091,691	1,091,691
1988	2,688,113	1,776,471	1,940,156	187,156	3,194,137	30,395	846	2,000,664	839,774	839,774
1989	2,357,669	1,348,806	1,326,863	132,076	2,218,516	50,948	13,206	1,257,332	792,087	792,087
1990	2,528,625	1,335,341	1,463,452	115,746	2,413,745	110,678	0	1,192,997	1,054,762	1,054,762
1991	1,048,414	531,160	1,022,405	125,256	1,686,304	65,111	473,291	540,119	796,531	796,531
1992	2,760,199	1,548,472	1,124,775	55,985	1,855,065	22,891	1,130,876	362,232	853,047	853,047
1993	3,559,487	1,332,392	2,256,338	29,498	3,721,492	60,615	1,101,799	425,969	1,406,255	1,406,255
1994	3,963,982	1,450,328	1,345,145	74,879	2,218,411	88,549	1,371,116	871,358	1,452,741	1,452,741
1995	4,324,009	1,901,361	2,498,462	44,237	4,120,837	43,892	881,146	75,278	1,397,623	1,397,623
1996	3,572,856	1,507,542	4,652,945	77,384	7,674,388	31,691	760,763	458,246	1,201,941	1,201,941
1997	3,411,379	1,468,949	4,294,703	42,135	4,319,206	24,319	891,191	625,340	1,175,556	1,175,556
1998	3,977,988	1,599,394	7,554,910	16,624	6,174,031	30,365	508,248	166,952	827,650	827,650
1999	3,696,973	1,694,851	3,195,685	71,662	3,678,076	18,305	501,486	815,001	1,375,575	1,375,575
2000	2,372,130	994,396	1,420,806	40,083	1,954,947	0	374,972	617,664	508,258	508,258
2001	2,680,895	1,418,179	460,256	53,460	759,169	0	213,385	1,339,699	119,363	119,363
2002	1,668,457	1,384,832	567,521	74,145	936,215	0	140,035	529,674	841,746	841,746
2003	1,445,146	1,353,956	411,258	44,506	678,236	0	405,376	780,631	624,561	624,561
2004	1,813,317	1,677,090	554,874	71,974	760,283	0	465,965	368,929	449,963	449,963
2005	2,047,638	1,443,555	1,721,141	32,667	1,987,091	0	542,366	400,828	566,063	566,063
2006	2,845,985	1,617,750	5,071,235	26,843	2,093,821	0	1,417,777	442,278	681,916	681,916
2007	2,990,954	1,864,667	3,225,680	77,880	1,331,802	0	2,023,088	710,515	177,256	177,256
2008	3,547,772	3,303,503	4,059,802	74,029	2,237,582	1,845	2,200,333	1,052,126	629,597	629,597
2009	3,350,539	3,010,931	4,067,070	79,671	1,633,327	3,263	2,559,670	1,152,062	1,025,723	1,025,723
2010	4,321,133	2,663,067	7,385,867	31,714	2,730,993	177	3,304,241	810,142	1,673,291	1,673,291
2011	4,952,954	1,811,301	5,605,548	13,018	2,290,872	407	309,065	551,068	2,185,513	2,185,513
2012	5,401,397	2,619,529	8,864,502	48,852	3,451,280	495	848,848	1,072,349	7,388,666	1,677,958
2013	2,571,905	2,284,510	2,291,863	78,579	1,451,407	3,708	487,707	516,502	1,907,291	592,411
2014	1,286,276	1,507,846	1,099,154	90,799	809,780	8,550	296,456	339,581	1,026,791	277,249
<b>2015</b>	<b>866,680</b>	<b>557,523</b>	<b>882,130</b>	<b>33,962</b>	<b>530,606</b>	<b>10,607</b>	<b>426,726</b>	<b>138,116</b>	<b>619,567</b>	<b>221,281</b>
2016	451,716	309,246	510,276	21,392	205,623	7,172	290,562	66,420	378,419	106,223
2017	443,001	303,313	500,487	20,982	201,678	7,035	286,109	65,146	371,160	104,185
2018	178,261	122,051	201,393	8,443	81,154	2,831	115,128	26,214	149,352	41,923
2019	174,357	91,174	201,779	8,459	81,310	2,836	129,732	26,265	149,639	42,004
2020	189,192	99,574	218,947	9,179	88,228	3,077	141,748	28,499	162,371	45,578
2021	276,294	147,917	319,748	13,405	128,847	4,494	207,007	41,620	237,124	66,561
2022	261,573	142,700	302,712	12,691	121,982	4,255	195,978	39,402	224,491	63,015
2023	191,876	106,414	222,053	9,309	89,479	3,121	143,759	28,904	164,674	46,224
2024	143,412	80,996	165,967	6,958	66,878	2,333	107,448	21,603	123,080	34,549
2025	23,470	13,468	27,161	1,139	10,945	382	17,584	3,535	20,142	5,654
2026	29,430	17,054	34,058	1,428	13,724	479	22,049	4,433	25,257	7,090
2027	43,792	25,675	50,680	2,125	20,422	712	32,810	6,597	37,584	10,550
2028	30,378	17,982	35,156	1,474	14,167	494	22,760	4,576	26,072	7,318
2029	30,227	18,132	34,981	1,467	14,096	492	22,647	4,553	25,942	7,282
2030	9,060	5,496	10,485	440	4,225	147	6,788	1,365	7,776	2,183
2031	9,035	5,573	10,456	438	4,213	147	6,769	1,361	7,754	2,177
2032	9,266	5,799	10,723	450	4,321	151	6,942	1,396	7,952	2,232
2033	9,190	5,835	10,635	446	4,286	149	6,885	1,384	7,887	2,214
2034	9,100	5,860	10,531	441	4,244	148	6,818	1,371	7,810	2,192
2035	9,272	6,055	10,730	450	4,324	151	6,947	1,397	7,958	2,234
<b>TOTAL</b>	<b>98,235,375</b>	<b>55,033,114</b>	<b>91,368,651</b>	<b>2,637,224</b>	<b>83,034,571</b>	<b>760,611</b>	<b>25,428,234</b>	<b>16,877,765</b>	<b>53,366,791</b>	<b>28,814,273</b>

(a) 1983 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include both debt service and bond cover.

(b) 2009 through 2015 charges also include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

**TABLE B-16B Minimum OMP&R Component of Transportation Charge  
for Each Contractor for Off-Aqueduct Power Facilities <sup>a b</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				TOTAL STATE WATER PROJECT (c)
	San Geronio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total	
	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	12,791,358	0	16,045,220	0	0	0	0	20,182,468
1984	0	39,229,567	0	47,840,887	0	0	0	0	60,556,781
1985	0	77,446,523	0	89,844,437	0	0	0	0	108,590,343
1986	0	77,581,287	0	90,192,510	0	0	0	0	107,702,921
1987	0	68,939,195	0	82,614,055	0	0	0	0	99,411,597
1988	0	79,936,309	0	92,720,660	0	0	0	0	108,898,833
1989	0	68,311,546	0	78,302,473	0	0	0	0	89,857,307
1990	0	83,964,409	277,885	95,002,982	0	0	0	0	104,000,038
1991	0	54,214,229	132,209	61,123,236	0	0	0	0	64,233,890
1992	0	72,401,054	0	82,482,592	0	0	0	0	92,173,695
1993	0	55,312,615	0	69,847,379	0	0	0	0	87,174,348
1994	0	72,838,621	0	86,354,006	0	0	0	0	97,722,979
1995	0	40,862,813	0	56,786,199	0	0	0	0	74,988,898
1996	0	36,536,259	401	57,198,086	0	0	0	0	71,940,675
1997	0	37,121,379	108,559	54,131,368	0	0	0	0	65,536,671
1998	0	30,341,609	149,170	52,004,747	0	0	0	0	65,310,733
1999	0	42,257,580	106,226	58,122,094	0	0	0	0	72,133,666
2000	0	43,977,877	123,318	52,641,597	0	0	0	0	60,213,003
2001	0	49,405,276	84,868	56,980,422	0	0	0	0	62,827,875
2002	0	45,412,974	153,549	54,123,159	0	0	0	0	59,683,427
2003	3,303	41,917,356	129,134	48,071,447	0	0	0	0	53,245,891
2004	44,648	58,676,035	170,851	67,126,699	0	0	0	0	73,135,768
2005	41,448	56,220,579	61,131	66,633,000	0	0	0	0	75,946,420
2006	265,078	60,701,335	70,268	76,767,951	0	0	0	0	85,894,802
2007	248,328	61,354,857	119,861	76,763,990	0	0	0	0	83,828,015
2008	616,986	72,144,765	300,729	93,579,549	0	0	0	0	102,461,628
2009	819,589	71,530,603	313,357	93,493,811	0	0	0	0	102,494,682
2010	1,048,807	88,263,837	322,003	117,224,130	0	0	0	0	128,041,372
2011	954,501	80,381,761	225,564	100,750,481	0	0	0	0	113,077,670
2012	1,225,982	78,031,474	299,385	110,930,715	0	0	0	0	121,679,593
2013	670,340	49,863,682	143,769	62,863,674	0	0	0	0	70,845,755
2014	292,797	30,563,068	60,891	37,659,238	0	0	0	0	43,856,442
<b>2015</b>	<b>121,140</b>	<b>14,604,834</b>	<b>32,636</b>	<b>19,045,808</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21,332,906</b>
2016	94,129	6,550,150	16,727	9,008,054	0	0	0	0	9,917,696
2017	92,508	6,424,491	16,406	8,836,499	0	0	0	0	9,728,690
2018	37,263	2,585,173	6,602	3,555,787	0	0	0	0	3,914,799
2019	37,253	2,587,634	19,843	3,552,284	0	0	0	0	3,905,256
2020	40,422	2,807,795	21,531	3,856,141	0	0	0	0	4,239,144
2021	59,032	4,100,473	31,444	5,633,967	0	0	0	0	6,193,301
2022	55,887	3,882,004	29,768	5,336,458	0	0	0	0	5,865,991
2023	40,996	2,847,625	21,836	3,916,270	0	0	0	0	4,304,706
2024	30,641	2,128,367	16,321	2,928,552	0	0	0	0	3,218,876
2025	5,014	348,313	2,671	479,478	0	0	0	0	526,990
2026	6,288	436,763	3,349	601,402	0	0	0	0	660,980
2027	9,357	649,922	4,984	895,210	0	0	0	0	983,864
2028	6,491	450,846	3,457	621,172	0	0	0	0	682,671
2029	6,458	448,599	3,440	618,316	0	0	0	0	679,508
2030	1,936	134,458	1,031	185,389	0	0	0	0	203,730
2031	1,930	134,088	1,028	184,970	0	0	0	0	203,261
2032	1,980	137,517	1,055	189,784	0	0	0	0	208,542
2033	1,964	136,390	1,046	188,312	0	0	0	0	206,917
2034	1,944	135,049	1,036	186,542	0	0	0	0	204,964
2035	1,981	137,608	1,055	190,162	0	0	0	0	208,933
<b>TOTAL</b>	<b>6,886,420</b>	<b>1,890,199,931</b>	<b>3,590,392</b>	<b>2,356,233,352</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,705,039,911</b>

(a) 1983 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include both debt service and bond cover.

(b) 2009 through 2015 charges also include Reid Gardner separation costs that are allocated to contractors based on theoretical energy use for years 1983-2010.

(c) Costs allocated to contractors in 1989 through 2002 are reduced by credits for Off-Aqueduct Power Facility costs allocated to the pumping of non-SWP water.

**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 1 of 5

Calendar Year	NORTH BAY AQUEDUCT						SOUTH BAY AQUEDUCT		CALIFORNIA AQUEDUCT	
	Reach 1 Barker Slough Pumping Plant		Reach 3A Cordelia Pumping Plant Solano County WA		Reach 3B Cordelia Pumping Plant Napa County FC&WCD (a)		Reach 1 South Bay and Del Valle Pumping Plants (b)		Reach 1 Banks Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	4.1511341	4.1511341	0	0
1964	0	0	0	0	0	0	4.5639383	4.5639383	0	0
1965	0	0	0	0	0	0	3.5452154	3.5452154	0	0
1966	0	0	0	0	0	0	4.1911773	4.1911773	0	0
1967	0	0	0	0	0	0	3.5074573	3.5074573	0	0
1968	0	0	0	0	0	0	3.9306767	4.1752198	0.2445431	0.2445431
1969	0	0	0	0	5.7570017	5.7570017	3.3315620	4.8750942	1.5435322	1.5435322
1970	0	0	0	0	3.1823595	3.1823595	3.6949019	4.8016170	1.1067151	1.1067151
1971	0	0	0	0	3.7584301	3.7584301	4.4256141	5.3721490	0.9465349	0.9465349
1972	0	0	0	0	4.2082507	4.2082507	3.8714396	4.7522833	0.8808437	0.8808437
1973	0	0	0	0	3.9577735	3.9577735	4.3250690	5.2281686	0.9030996	0.9030996
1974	0	0	0	0	3.8103903	3.8103903	5.2455409	6.1841801	0.9386391	0.9386391
1975	0	0	0	0	3.5878850	3.5878850	6.3321503	7.2293909	0.8972406	0.8972406
1976	0	0	0	0	2.1606725	2.1606725	3.7365711	4.8327731	1.0962020	1.0962020
1977	0	0	0	0	2.9283909	2.9283909	4.5191527	5.7132795	1.1941268	1.1941268
1978	0	0	0	0	2.7516411	2.7516411	4.7630172	6.3099080	1.7679736	1.7679736
1979	0	0	0	0	3.5949619	3.5949619	5.2086183	6.8200210	1.6114026	1.6114026
1980	0	0	0	0	2.4747752	2.4747752	4.9524184	7.0948489	2.1420665	2.1420665
1981	0	0	0	0	2.9737588	2.9737588	4.5186576	5.8810391	1.3623815	1.3623815
1982	0	0	0	0	2.6488168	2.6488168	4.3834851	6.4541818	2.0706967	2.0706967
1983	0	0	0	0	10.0222589	10.0222589	5.6383622	7.4005197	1.7621575	1.7621575
1984	0	0	0	0	1.0240490	1.0240490	0.8686401	1.7143948	0.8457546	0.8457546
1985	0	0	0	0	1.6496750	1.6496750	2.7674018	3.9368186	1.1694168	1.1694168
1986	0	0	0	0	2.5224065	2.5224065	3.6942206	5.2987621	1.6045415	1.6045415
1987	0	0	0	0	4.4049446	4.4049446	7.2799222	10.5919298	3.3120077	3.3120077
1988	0	0	0	0	3.5386715	3.5386715	6.4837861	9.2276309	2.7438448	2.7438448
1989	1.1782643	1.1782643	2.5423866	1.1782643	4.4547478	5.6330121	6.1750026	8.8623074	2.6873049	2.6873049
1990	1.2715449	1.2715449	4.2324041	3.8139316	4.2807103	5.5522552	8.1617218	11.6840191	3.5222973	3.5222973
1991	2.0026083	2.0026083	6.2350124	5.8753602	7.8779685	11.7200790	15.8516543	4.1315753	4.1315753	4.1315753
1992	1.2486830	1.2486830	2.6246433	3.8733263	3.8057971	5.0544801	7.5402615	11.2354099	3.6951485	3.6951485
1993	0.7094386	0.7094386	1.4175705	2.1270091	2.3509123	3.0603509	4.0600958	6.3925272	2.3324315	2.3324315
1994	-0.3464574	-0.3464574	-0.6048649	-0.9513223	-1.0200530	-1.3665104	-1.4929934	-1.2571378	0.2358556	0.2358556
1995	1.4600287	1.4600287	2.6570107	4.1170394	4.2975560	5.7575847	7.9510779	11.2405895	3.2895116	3.2895116
1996	0.7544766	0.7544766	1.2974265	2.0519031	2.2753763	3.0298529	3.2312761	5.2610469	2.0297708	2.0297708
1997	1.6427835	1.6427835	2.7704025	4.4131859	4.7993051	6.4420886	8.0186492	11.3633900	3.3447498	3.3447498
1998	1.7801484	1.7801484	3.0246843	4.8048327	5.0575904	6.8377388	9.6521246	12.6148370	2.9627125	2.9627125
1999	-0.3253238	-0.3253238	-0.5570754	-0.8823992	-0.9104311	-1.2357549	-1.8866894	-1.7684350	0.1182544	0.1182544
2000	0.7843563	0.7843563	1.2927037	2.0770600	2.1913971	2.9757534	3.9861234	6.3554740	2.3696240	2.3696240
2001	1.7300176	1.7300176	1.8775164	3.6075340	2.8896148	4.6196324	6.0338390	8.2478290	2.2139900	2.2139900
2002	10.0430980	10.0430980	12.6732715	22.7163696	22.9041445	32.9472425	42.6443270	55.5130485	12.8687216	12.8687216
2003	5.1561098	5.1561098	5.3026984	10.4588082	8.9411156	14.0972254	18.1280636	24.2060285	6.0779649	6.0779649
2004	5.1470505	5.1470505	7.0925479	12.2395984	12.8073799	17.9544304	19.2954367	26.2045482	7.2291116	7.2291116
2005	6.1803231	6.1803231	6.4041451	12.5844682	12.5865996	18.7669227	19.8212463	27.0762480	7.2550017	7.2550017
2006	7.6496541	7.6496541	7.6521314	15.3017855	18.5155450	26.1651991	25.7918365	33.8520540	8.0602175	8.0602175
2007	6.3411515	6.3411515	5.9418551	12.2830066	17.7807245	24.1218940	22.1272863	28.6764964	6.5492101	6.5492101
2008	10.3140886	10.3140886	8.0335196	18.3476082	22.5119243	32.8260129	31.2045272	40.2883862	9.0838590	9.0838590
2009	8.5780412	8.5780412	9.4219804	18.0000216	20.9842547	29.5622960	27.2258607	38.9928813	11.7670206	11.7670206
2010	6.8157853	6.8157853	7.3689097	14.1846950	15.6049670	22.4207523	23.3713636	29.7295538	6.3545902	6.3545902
2011	6.6614422	6.6614422	8.6699171	15.3313594	16.6906881	23.3521303	24.7056036	35.6013934	10.8957897	10.8957897
2012	7.8065749	7.8065749	8.9188708	16.7254457	20.1897685	27.9963434	29.9070627	40.6934613	10.7863987	10.7863987
2013	7.9401148	7.9401148	10.0567251	17.9968399	19.6658813	27.6059962	32.1911050	42.8874349	10.6963299	10.6963299
2014	11.7015615	11.7015615	11.2964162	22.9979777	27.1673850	38.8689465	38.1762911	51.8467554	13.6704643	13.6704643
2015	15.3370914	15.3370914	5.9912436	21.3283350	28.4270180	43.7641094	46.1335831	61.9637277	15.8301446	15.8301446
2016	9.1648490	9.1648490	17.8563122	27.0211612	23.1571183	32.3219672	41.7633208	58.0086213	16.2453005	16.2453005
2017	12.2403461	12.2403461	24.1227399	36.3630860	36.5117681	48.7521141	42.7397448	58.8037606	16.0640158	16.0640158
2018	12.2403461	12.2403461	24.1227399	36.3630860	36.5117681	48.7521141	42.7397448	55.9679817	13.2282369	13.2282369
2019	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	57.2659549	14.5251559	14.5251559
2020	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	57.1516392	14.4108402	14.4108402
2021	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	59.0082392	16.2674402	16.2674402
2022	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	57.8341543	15.0933553	15.0933553
2023	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	58.8982633	16.1574643	16.1574643
2024	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	56.9149056	14.1741066	14.1741066
2025	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	56.7840786	14.0432796	14.0432796
2026	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	56.9556397	14.2148407	14.2148407
2027	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	54.8852855	12.1444865	12.1444865
2028	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	59.3193195	16.5785205	16.5785205
2029	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	59.5178109	16.8373101	16.8373101
2030	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	54.6303845	11.8895855	11.8895855
2031	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	57.6570586	14.9162596	14.9162596
2032	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	55.0554201	12.3146211	12.3146211
2033	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	61.2783947	18.5375957	18.5375957
2034	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	56.1154416	13.3746426	13.3746426
2035	12.2403513	12.2403513	24.1227391	36.3630904	36.6408726	48.8812238	42.7407990	67.1574575	24.4166585	24.4166585

(a) For the period 1968 through 1987, rates are for an interim facility.

(b) The relatively minor costs of Del Valle Pumping Plant have been combined with those of South Bay Pumping Plant to simplify the allocation procedure.

**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 2 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	Reach 4 Dos Amigos Pumping Plant		Reach 14A Buena Vista Pumping Plant		Reach 15A Teerink Pumping Plant		Reach 16A Chrisman Pumping Plant		Reach 17E Edmonston Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	1.0732031	2.6167353	0	0	0	0	0	0	0	0
1969	0.7028165	1.8095316	0	0	0	0	0	0	0	0
1970	0.7813430	1.7278778	0.3333333	2.0612111	0	0	0	0	0	0
1971	0.4125312	1.2933749	1.1407617	2.4341366	0.7218469	3.1559834	0	0	0	0
1972	0.5662758	1.4693754	0.8894941	2.3588694	0.8040021	3.1628715	1.8113853	4.9742569	7.3206022	12.2948591
1973	0.5996892	1.5383283	0.8469026	2.3852309	1.0302066	3.4154375	1.8458304	5.2612679	7.4512435	12.7125113
1974	0.5736894	1.4709300	0.8122890	2.2832190	0.9665911	3.2498101	1.7739395	5.0237496	6.9004732	11.9242227
1975	0.4606980	1.5569000	0.7554447	2.3123448	0.8894108	3.2017555	1.8682537	5.0700092	6.9962702	12.0662794
1976	0.5163828	1.7105095	0.9081491	2.6186586	0.9640628	3.5822714	2.1499640	5.7326854	7.9384515	13.6711369
1977	0.6138931	2.3818668	0.9835371	3.3654038	1.2303967	4.5958005	2.7357728	7.3315733	9.9990004	17.3305737
1978	0.4545898	2.0659925	0.9044582	2.9704506	0.9762058	3.9466656	1.8872449	5.8339014	7.0810192	12.9149206
1979	0.6587934	2.8008600	1.0519199	3.8527798	1.1976258	5.0504056	2.6012890	7.6516946	9.6345625	17.2862572
1980	0.8021465	2.1645280	1.3516057	3.5161337	1.5041463	5.0202800	3.1923433	8.2126233	10.9860288	19.1986521
1981	1.0923907	3.1630874	1.2409168	4.4040042	1.3219771	5.7259813	2.9592932	8.6852745	9.9649551	18.6502296
1982	0.8326785	2.5948359	1.2041660	3.7990019	1.3723736	5.1713756	2.8986491	8.0700247	9.9990004	18.2796606
1983	0.3647859	1.2105406	0.7590265	1.9695670	0.8857383	2.8553053	1.7623405	4.6176458	5.5086367	10.1262825
1984	0.6581523	1.8275691	1.0533611	2.8809302	1.2188270	4.0997572	2.5407768	6.6405340	8.2344665	14.8750006
1985	0.8726163	2.4771579	1.4204831	3.8976409	1.6516291	5.5492701	3.4695783	9.0188484	11.8181234	20.8369718
1986	1.3996542	4.7116618	2.3713282	7.0829901	2.7567970	8.9397871	5.9534613	15.7932484	20.6010240	36.3942724
1987	1.2912643	4.0351091	2.2344385	6.2695476	2.5459999	8.8155474	5.3141190	14.1296664	17.7628277	31.8924941
1988	1.1947837	3.8820886	2.1129991	5.9950877	2.4017135	8.3968012	5.0055748	13.4023759	16.6001692	30.0025452
1989	1.4935226	5.0158199	2.6947446	7.7105645	3.0084211	10.7189956	6.5499538	17.2689394	22.1795336	39.4484730
1990	1.8962463	6.0278216	3.3080372	9.3358588	3.7483036	13.0841624	8.6832678	21.7674302	31.0405219	52.8079521
1991	1.0437991	4.7389476	2.1132495	6.8521971	2.4154810	9.2676780	5.6823745	14.9500525	20.4744695	35.4245220
1992	0.9002103	3.2326417	1.4836761	4.7163178	1.7077297	6.4240475	5.3445788	10.7002623	12.0596599	22.0145862
1993	0.1605206	0.3963762	-0.1405164	0.2558598	-0.1312944	0.1245654	-0.7754796	-0.6509143	-3.5828989	-4.2338132
1994	1.4208578	4.7103693	2.5100856	7.2204549	1.2804211	10.0233717	6.0772944	16.006661	22.1500984	37.6007645
1995	0.7974861	2.8272569	1.3474564	4.1747133	1.4945529	5.6692662	3.1250716	8.7943378	10.7461772	19.5405149
1996	1.6726383	5.0173881	2.5952092	7.6125973	2.8425227	10.4551200	6.3087407	16.7638607	22.6420778	39.4059385
1997	1.2769880	4.2397005	2.5012144	6.7409148	2.6893394	9.4302542	6.2890095	15.7192637	23.0714697	38.7907334
1998	-0.2195574	-0.1013030	-0.4232465	-0.5245494	-0.0456010	-0.9750105	-1.0585256	-2.0335361	-3.8077856	-5.8413217
1999	0.8412976	3.2109216	1.4071463	4.6180679	1.2831855	5.9012534	3.4289262	9.3301795	13.6776471	23.0748267
2000	0.8831721	3.0971621	1.5510989	4.6482610	1.7049532	6.3521422	4.0192405	10.3724547	14.7157795	25.0882342
2001	6.1123778	18.9810994	11.2648844	30.2459837	12.3519389	42.5979227	28.5490444	71.1469671	106.8554939	178.0024610
2002	2.6241510	8.7021160	4.6014508	13.3035668	5.0195661	18.3231329	11.6145173	29.9376502	43.1568537	73.0945038
2003	3.1202696	9.8493811	5.5874811	15.4368622	6.0872217	21.5240839	14.1581535	35.8622374	52.6394569	88.3216943
2004	3.3220914	10.5770931	5.8515717	16.4286648	6.3561368	22.7848016	14.8070070	37.5918086	52.6398334	92.6398334
2005	3.8070561	11.8672735	6.8334388	18.7007123	7.4067583	26.1074707	17.2234578	43.3309284	62.0384555	105.3693839
2006	2.9857429	9.5349530	5.5659445	15.1008975	5.9905335	21.0914310	14.0057497	35.0971806	47.7171619	82.8143425
2007	4.4313666	13.5152256	7.9529931	21.4682187	8.6112177	30.0794364	19.9664325	50.0458689	69.3995205	119.4453894
2008	4.4905784	16.2575991	8.4139003	24.6714993	9.8240646	34.4955639	20.3840313	54.8795952	71.9661450	126.8457402
2009	3.4320946	9.7866848	6.2740716	16.0607564	6.9285369	22.9829333	15.3431427	38.3324360	59.3701267	97.7025627
2010	4.0747593	14.9705491	7.0093261	21.9798752	7.6057576	29.586327	17.4080790	46.9937117	64.6193067	111.6130184
2011	4.5474939	15.3338925	8.0199977	23.3538903	8.6413007	31.9951910	19.8891167	51.8843076	70.6675111	122.5518187
2012	4.8074262	15.5037562	8.3861250	23.8898811	9.1381262	33.0280073	21.1431750	54.1711824	75.3688511	129.5400335
2013	5.8247490	19.4952133	10.1907200	29.6859333	11.1181381	40.8040714	25.7333037	66.5373751	92.3259453	158.8633204
2014	8.3575670	24.1877116	12.8236738	37.0113854	15.5496194	52.5610048	38.5599639	91.1209687	153.3216520	244.4426207
2015	7.4231284	23.6630782	12.5398944	36.2029726	13.6253575	49.8283301	31.6299903	81.4583203	115.1133298	196.5716501
2016	7.4173589	23.6626595	12.5406872	36.2033466	13.6262081	49.8295547	31.6336735	81.4632282	115.1373818	196.6006100
2017	7.2017391	23.2657549	12.8681034	36.1338584	13.9146760	50.0485344	32.2486031	82.2971375	119.8682358	202.1653733
2018	7.6508259	20.8790628	13.9765949	34.8556577	15.1908558	50.0465135	35.2615559	85.3080694	131.2236964	216.5317659
2019	7.2363713	21.7615271	12.9369202	34.6984473	14.0003057	48.6987531	32.4511348	81.1498878	120.6255406	201.7754284
2020	7.3906749	21.8015151	13.3228904	35.1244055	14.4390386	49.5634441	33.4856667	83.0491108	124.5255164	207.5746272
2021	7.3559552	23.6233954	13.2356400	36.8590355	14.3397576	51.1987931	33.2514753	84.4502684	123.6423903	208.0926587
2022	7.4001775	22.4935328	13.3470362	35.8405690	14.4665376	50.3071066	33.5505530	83.8576596	124.7702656	208.6279251
2023	7.4490016	23.6064659	13.4704999	37.0769658	14.6071665	51.6841323	33.8824025	85.5665348	126.0220400	211.5885748
2024	7.3546314	21.5287380	13.2327512	34.7614893	14.3364941	49.0979663	33.2438062	82.3417925	123.6135366	205.953291
2025	7.4287757	21.4720554	13.4194085	34.8914639	14.5489639	49.4404277	33.7450517	83.1854794	125.5039154	208.6893948
2026	7.3143737	21.5292144	13.1323391	34.6615534	14.2232434	48.8838959	32.9746165	81.8585124	122.5987056	204.4572180
2027	7.4457077	19.5901941	13.4622487	33.0524428	14.5977697	47.6502124	33.8602299	81.5104423	125.9384056	207.4488480
2028	7.3511401	23.9296606	13.2244137	37.1540743	14.3270375	51.4811118	33.2215152	84.7026270	123.5295523	208.2321793
2029	7.4178659	24.2551760	13.3920420	37.6472179	14.5178052	52.1650232	33.6715364	85.8365595	125.2266450	211.0632045
2030	7.3251160	19.2147014	13.1596495	32.3743509	14.2534143	46.6277653	33.0479071	79.6756724	122.8750733	202.5507456
2031	7.7078640	22.6241236	14.1335376	36.7576612	15.3644903	52.1221515	35.6712878	87.7934393	132.7755777	220.5690169
2032	7.1347916	19.4494128	12.6905548	32.1399675	13.7211749	45.8611425	31.7937199	77.6548624	118.1496486	195.8045110
2033	7.6980938	26.2366895	14.1075950	40.3432845	15.3347528	55.6780373	35.6009560	91.2789933	132.5097723	223.7887656
2034	7.1807903	20.5554329	12.8038012	33.3592341	13.8495359	47.8087700	32.0960841	79.3048542	119.5933049	198.5933849
2035	8.2388334	32.6554919	15.5484341	48.2039260	16.9930404	65.1969664	39.5288640	104.7258124	147.3728417	252.0986541

**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 3 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 18A Alamo Powerplant		Reach 22B Pearblossom Pumping Plant		Reach 23 Mojave Siphon Powerplant		Reach 26A Devil Canyon Powerplant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	1.9331104	14.2279695	0	0	-2.3717647	11.8562048
1973	0	0	3.8751940	16.5877053	0	0	-8.9027252	7.6849801
1974	0	0	3.1602116	15.0844343	0	0	-5.3440968	9.7403376
1975	0	0	3.0210558	15.0873353	0	0	-5.7803309	9.3070043
1976	0	0	3.7579009	17.4290378	0	0	-6.6439666	10.7850713
1977	0	0	3.0796474	20.4102211	0	0	-12.0911833	8.3190378
1978	0	0	4.0233030	16.9382236	0	0	-8.2569506	8.6812730
1979	0	0	5.0776468	22.3639040	0	0	-9.7140035	12.6499005
1980	0	0	4.3918283	23.5904804	0	0	-8.3797007	15.2107797
1981	0	0	3.9973528	22.6475824	0	0	-6.7528590	15.8947235
1982	0	0	3.6829998	21.9626604	0	0	-6.9238898	15.0387706
1983	0	0	1.7205305	11.8468130	0	0	-23.7923457	-11.9455328
1984	0	0	2.4763871	17.3513877	0	0	-29.2940447	-11.9426570
1985	0	0	3.4967556	24.3337274	0	0	-30.7672356	-6.4335082
1986	-2.3583180	34.0359544	5.9864597	40.0224141	0	0	-29.2499580	10.7724561
1987	-2.5482255	29.3442686	5.0535029	34.3977715	0	0	-29.7006534	4.6971181
1988	-1.3847067	28.6178385	4.7392460	33.3570844	0	0	-29.0334518	4.3236326
1989	-1.1019487	38.3465243	6.4066114	44.7531357	0	0	-28.3706997	16.3824360
1990	-1.0673268	51.7406253	8.9787944	60.7194197	0	0	-28.8797266	31.8396931
1991	-1.5206590	33.9038630	6.0785417	39.9824047	0	0	-30.3294563	9.6529484
1992	-2.6080003	19.4065859	3.6219501	23.0285360	0	0	-29.7938993	-6.7653633
1993	-0.1885524	-4.4223656	-1.0192774	-5.4416430	0	0	-30.6629489	-36.1045919
1994	-0.1279266	37.4728379	6.4513573	43.9241952	0	0	-30.4781656	13.4480296
1995	-3.4425314	16.0979836	3.3643070	19.4622905	0	0	-30.3517624	-10.8894719
1996	-5.9839345	33.4220040	6.6794995	40.1015035	-2.3423415	37.7591620	-29.5900574	8.1691046
1997	-4.7847600	34.0059734	6.8397922	40.8457656	-3.8632009	36.9825646	-29.7006647	6.3758999
1998	-5.0614104	-10.9027321	-1.3239652	-12.2266973	-3.7700558	-15.9967531	-30.4293072	-46.4280603
1999	-4.8990186	18.1088081	3.7378677	21.8466757	-5.1563836	16.6902921	-30.2385322	-13.5482400
2000	-5.3488706	19.7393636	4.3552151	24.0945787	-5.1804371	18.9141416	-30.2852311	-11.3710894
2001	-4.6452108	173.3572502	29.9523513	203.3096015	-5.7699537	197.5396478	-30.9018397	166.6378081
2002	-5.4660286	67.6284752	12.9716035	80.6000788	-6.4072101	74.1928686	-30.1661590	44.0267096
2003	-3.3142156	85.0074786	15.4308820	100.4383606	-7.1779336	93.2604270	-30.3892607	62.8711664
2004	-5.5767140	87.0631195	16.1802355	103.2433550	-7.4292488	95.8141062	-30.2389380	65.5751682
2005	-5.5017080	99.8676759	17.8281118	117.6957877	-6.6110924	111.0846953	-30.2939296	80.7907657
2006	-3.1387155	79.6756270	13.7752032	93.4508303	-5.4976224	87.9532078	-29.8005787	58.1526291
2007	-2.7809944	116.6643950	20.2594364	136.9238314	-6.1785168	130.7453146	-29.0961198	100.6491949
2008	-5.4028716	121.4428686	20.2854899	141.7283585	-6.0198040	135.7085544	-30.7631237	104.9454308
2009	-6.3446583	91.3579044	19.9540519	111.3119564	-5.4878080	105.8241484	-33.3163093	72.5078390
2010	-5.1259757	106.4870427	18.7340325	125.2210752	-6.4398404	118.7812349	-28.6783430	90.1028918
2011	-5.2103711	117.3414476	20.7550215	138.0964691	-7.1272044	130.9692647	-29.9982569	100.9710078
2012	-2.7221204	126.8179131	22.2013451	149.0192582	-11.4254128	137.5938454	-30.6216868	106.9721586
2013	-3.7639388	155.0993816	27.1498280	182.2492096	-10.3251093	171.9241003	-30.7664075	141.1576928
2014	-12.3236334	232.1189873	55.1425768	287.2615641	-17.0669496	270.1946145	-39.1744193	231.0201952
<b>2015</b>	<b>-9.0598771</b>	<b>187.5117731</b>	<b>38.4090352</b>	<b>225.9208082</b>	<b>-14.3989058</b>	<b>211.5219024</b>	<b>-33.4108822</b>	<b>178.1110202</b>
2016	-9.0195693	187.5810408	38.3183424	225.8993832	-14.3215338	211.5778493	-33.2163273	178.3615220
2017	-8.2492248	193.9161485	33.7980365	227.7141851	-12.5202975	215.1938875	-29.9843246	185.2095629
2018	-9.0704907	207.4612751	37.6987062	245.1599813	-14.0151913	231.1447900	-31.2299589	199.9148311
2019	-8.0895002	193.6859282	33.3498556	227.0357838	-12.6152709	214.4205129	-29.7782600	184.6422529
2020	-8.3640525	199.2105747	34.5972069	233.8077815	-13.1512537	220.6565278	-31.0861440	189.5703838
2021	-8.3615571	199.7311017	34.5066178	234.2377194	-13.1148339	221.1228855	-30.4351394	190.6877462
2022	-8.3814710	200.2464542	34.5989199	234.8453741	-13.1519425	221.6934315	-29.9116009	191.7818307
2023	-8.5011636	203.0874112	35.2154928	238.3029040	-13.4001201	224.9027839	-30.7405757	194.1622082
2024	-8.1741847	197.7811444	33.6426745	231.4238189	-12.7680531	218.6557658	-30.3951255	188.2606403
2025	-8.4521783	200.2372165	34.9273046	235.1645211	-13.2840569	221.8804642	-30.2481371	191.6323271
2026	-8.2251869	196.2320312	33.9555766	230.1876078	-12.8935341	217.2940736	-30.5650504	186.7290232
2027	-8.4054302	199.0434177	34.7110742	233.7544919	-13.1970479	220.5574441	-30.3923815	190.1650626
2028	-8.3174813	199.9146979	34.3042033	234.2189013	-13.0334963	221.1854049	-30.6233221	190.5620828
2029	-8.3464468	202.7167576	34.4981791	237.2149367	-13.1114418	224.1034949	-30.3111861	193.7923088
2030	-8.2794784	194.2712672	34.1292129	228.4004801	-12.9632230	215.4372571	-30.4092294	185.0280277
2031	-8.6255785	211.9434385	35.7349034	247.6783418	-13.6095861	234.0687558	-30.4951500	203.5736058
2032	-7.9764072	187.8281038	32.8113791	220.6394828	-12.4353184	208.2041644	-29.7289089	178.4752555
2033	-8.6895775	215.0991881	36.0337731	251.1329612	-13.7302783	237.4026828	-31.3297872	206.0728957
2034	-8.1155449	190.4778400	33.3748599	223.8526999	-12.6607566	211.1919433	-29.6271693	181.5642495
2035	-8.7812102	243.3174439	36.5266598	279.8441037	-13.9295844	265.9145193	-31.6531333	234.2613860



**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 4 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 2B (EBX) Greenspot Pump Station		Reach 3A (EBX) Crafton Hills Pump Station		Reach 4B (EBX) Cherry Valley Pump Station		Reach 29A Oso Pumping Plant	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	1.1017349	13.3965941
1973	0	0	0	0	0	0	0.7905574	13.5030687
1974	0	0	0	0	0	0	0.7530214	12.6772442
1975	0	0	0	0	0	0	0.8405850	12.9068644
1976	0	0	0	0	0	0	0.7771828	14.4483197
1977	0	0	0	0	0	0	0.6152458	17.9458194
1978	0	0	0	0	0	0	0.5222831	13.4372037
1979	0	0	0	0	0	0	0.7045701	17.9908273
1980	0	0	0	0	0	0	1.4269064	20.6255585
1981	0	0	0	0	0	0	1.5684309	20.2186605
1982	0	0	0	0	0	0	1.4942585	19.7739190
1983	0	0	0	0	0	0	1.2818887	11.4081712
1984	0	0	0	0	0	0	1.7796296	16.6546302
1985	0	0	0	0	0	0	2.1683838	23.0053556
1986	0	0	0	0	0	0	3.2288411	39.6231134
1987	0	0	0	0	0	0	3.1272967	35.0197908
1988	0	0	0	0	0	0	2.9878581	32.9904032
1989	0	0	0	0	0	0	3.5262089	42.9746819
1990	0	0	0	0	0	0	3.6810660	56.4890182
1991	0	0	0	0	0	0	2.1853025	37.6098245
1992	0	0	0	0	0	0	1.9048343	23.9194204
1993	0	0	0	0	0	0	0.1569728	-4.0768404
1994	0	0	0	0	0	0	3.0638504	40.6646149
1995	0	0	0	0	0	0	1.5724835	21.1129984
1996	0	0	0	0	0	0	3.1318961	42.5378346
1997	0	0	0	0	0	0	2.7928728	41.5836062
1998	0	0	0	0	0	0	-0.3226129	-6.1639346
1999	0	0	0	0	0	0	1.8332567	24.8410833
2000	0	0	0	0	0	0	1.7274598	26.8156940
2001	0	0	0	0	0	0	13.4927370	191.4951981
2002	0	0	0	0	0	0	4.8843428	77.9788467
2003	0	0	0	0	0	0	6.1265493	94.4482436
2004	20.6296577	86.2048259	21.3995735	107.6043994	8.6460880	116.2504874	6.4523495	99.0921829
2005	18.8668199	99.6595856	17.9554272	117.6150128	3.7103613	121.3253741	7.2999794	112.6693633
2006	17.8994354	76.0520645	22.1237217	98.1757862	23.2019703	121.3777565	5.3707600	88.1851025
2007	22.1898981	122.8390929	29.3753773	152.2144702	81.5764972	233.7909674	8.2372156	127.6826049
2008	18.8433579	123.7887886	25.2833027	149.0720914	10.4169482	159.4890395	8.9214655	135.7672057
2009	17.1360330	89.6438720	22.4798573	112.1237293	5.1541149	117.2778442	6.4371364	104.1396990
2010	17.9449307	108.0478225	24.4739521	132.5217746	3.9551715	136.4769461	7.9363896	119.5494080
2011	18.9059273	119.8769352	25.3757379	145.2526731	3.8897083	149.1423814	8.4208404	130.9726591
2012	20.2169299	127.1890886	27.6518992	154.8409878	4.9226976	159.7636853	8.9400466	138.4800800
2013	24.9917855	166.1494783	34.3061012	200.4555795	7.5542245	208.0098040	11.1119460	169.9752664
2014	57.5054478	288.5256429	72.6024564	361.1280994	14.6404834	375.7685827	16.3759804	260.8186011
2015	44.0765896	222.1876098	55.0071291	277.1947389	11.3353474	288.5300863	11.5465203	208.1181704
2016	44.2267823	222.5883043	55.1946050	277.7829093	11.3740466	289.1569559	11.5318874	208.1324974
2017	48.4122351	233.6217980	60.4180154	294.0398134	12.4503976	306.4902110	14.0604725	216.2258458
2018	48.4122351	248.3270662	60.4180154	308.7450816	12.4504817	321.1955633	15.2970839	231.8288498
2019	48.4122351	233.0544879	60.4180154	293.4725034	12.4504124	305.9229157	14.1221165	215.8975449
2020	48.4122351	237.9826189	60.4180154	298.4006343	12.4504124	310.8510466	14.4972348	222.0718619
2021	48.4122351	239.0999812	60.4180154	299.5179966	12.4504124	311.9684090	14.2819844	222.3746432
2022	48.4122351	240.1940657	60.4180154	300.6120811	12.4504124	313.0624935	14.5724671	223.2003922
2023	48.4122351	242.5744433	60.4180154	302.9924587	12.4504124	315.4428711	14.5801584	226.1687332
2024	48.4122351	236.6728753	60.4180154	297.0908908	12.4504124	309.5413031	14.8265116	220.7818407
2025	48.4122351	240.0445621	60.4180154	300.4625775	12.4504124	312.9129899	14.5970652	223.2864600
2026	48.4122351	235.1412583	60.4180154	295.5592737	12.4504124	308.0096861	14.3004524	218.7576704
2027	48.4122351	238.5772977	60.4180154	298.9953131	12.4504124	311.4457255	14.8680064	222.3168543
2028	48.4122351	238.9743179	60.4180154	299.3923333	12.4504124	311.8427457	14.3724817	222.6046609
2029	48.4122351	242.2045438	60.4180154	302.6225592	12.4504124	315.0729716	17.793929	225.8425974
2030	48.4122351	233.4402628	60.4180154	293.8582782	12.4504124	306.3086906	14.2792966	216.8300422
2031	48.4122351	251.9858408	60.4180154	312.4038562	12.4504124	324.8542686	16.4260731	236.9950900
2032	48.4122351	226.8874906	60.4180154	287.3055060	12.4504124	299.7559184	13.6425557	209.4470666
2033	48.4122351	254.4851308	60.4180154	314.9031462	12.4504124	327.3535585	16.1203635	239.9091291
2034	48.4122351	229.9764845	60.4180154	290.3945000	12.4504124	302.8449123	13.6510359	212.2442408
2035	48.4122351	282.6736211	60.4180154	343.0916365	12.4504124	355.5420489	21.6572948	273.7559489

**TABLE B-17 Unit Variable OMP&R Component of Transportation Charge**

(in dollars per acre-foot)

Sheet 5 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 29G Warne Powerplant		Reach 29J Castaic Powerplant		Reach 31A Las Perillas & Badger Hill Pumping Plants		Reach 33A Devil's Den, Bluestone, and Polonio Pass Pumping Plants	
	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate	Unit Rate	Cumulative Unit Rate
[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	1.5014866	4.1182219	0	0
1969	0	0	0	0	1.2624066	3.0719381	0	0
1970	0	0	0	0	1.6309699	3.3588477	0	0
1971	0	0	0	0	1.4985537	2.7919286	0	0
1972	0	0	-2.9350830	10.4615111	1.9517720	3.4211474	0	0
1973	0	0	-6.8099448	6.6931239	1.5374531	3.0757814	0	0
1974	0	0	-7.4013274	5.2759168	1.5168982	2.9878282	0	0
1975	0	0	-6.5604921	6.3463723	1.1130304	2.6699305	0	0
1976	0	0	-6.7213324	7.7269873	1.5685447	3.2790543	0	0
1977	0	0	-30.4985994	-12.5527800	1.7573375	4.1392043	0	0
1978	0	0	-9.0130187	4.4241850	1.9429506	4.0089431	0	0
1979	0	0	-19.0478097	-1.0569824	1.5600341	4.3608941	0	0
1980	0	0	-20.5438586	0.0816999	1.5124754	3.6770034	0	0
1981	0	0	-10.0059379	10.2127225	1.5414199	4.7045073	0	0
1982	-2.1714430	17.6024760	-9.5987314	8.0037446	1.7581649	4.3530008	0	0
1983	-8.9130752	2.4950960	-39.8193120	-37.3242160	0.1782765	1.3888171	0	0
1984	-15.0246012	1.6300290	-17.3126964	-15.6826674	0.8546712	2.6822403	0	0
1985	-14.7115359	8.2938197	-38.9450629	-30.6512432	1.2014351	3.6785929	0	0
1986	-14.1893653	25.4337481	-28.1596224	-2.7258742	2.2635886	6.9752505	0	0
1987	-14.8696165	20.1501743	-27.0536484	-6.9034741	1.9135072	5.9486162	0	0
1988	-14.7032843	18.2871189	-25.6857024	-7.3985835	1.7733386	5.6554272	0	0
1989	-14.4231503	28.5515316	-25.3986130	3.1529186	2.4159040	7.4317239	0	0
1990	-14.1850383	42.3039798	-26.0776142	16.2263657	3.7962150	9.8240367	0	0
1991	-14.7118704	22.8979541	-25.0234633	-2.1255092	2.4131016	7.1520492	0	0
1992	-14.6199430	9.2994774	-25.1951357	-15.8956583	1.2766372	4.5092789	0	0
1993	-10.3386607	-14.4155011	-21.1218973	-35.5373984	-1.1726172	-0.7762411	0	0
1994	-14.7696788	25.8949361	-26.7437304	-0.8487943	2.3645104	7.0748798	0	0
1995	-12.2705974	8.8424010	-25.6907993	-16.8483983	2.5750402	5.4022971	0	0
1996	-14.8515762	27.6862584	-29.5639188	-1.8776604	2.5837041	7.6010922	0	0
1997	-14.8692063	26.6563999	-27.1541858	-0.4977859	2.7029648	6.9426653	24.4572499	31.3999152
1998	-8.6695834	-14.8335180	-22.2303491	-37.0638671	-0.5072304	-0.6085333	-4.1828906	-4.7914239
1999	-14.9340263	9.9070570	-27.0443818	-17.1373248	1.3343489	4.5452705	9.5757906	14.1210611
2000	-14.1657261	12.6499679	-26.9670096	-14.3170418	1.8229550	4.9201171	13.5385990	18.4587161
2001	-16.7349304	174.7602677	-29.2914159	145.4688518	12.3088319	31.2899313	93.1086637	124.3989550
2002	-13.2004543	64.7783923	-23.7780808	41.0003115	5.4523570	14.1544730	42.2356453	56.3901183
2003	-13.9757172	80.4725264	-23.8496317	56.6228947	6.3022279	16.1516090	48.5640992	64.7157082
2004	-14.1574758	84.9347071	-25.2967499	59.6379572	6.4411290	17.0182221	52.3954777	69.4136998
2005	-14.2938796	98.3754837	-24.7472457	73.6282381	8.1479703	20.0152438	61.7293546	81.7445984
2006	-14.0865037	74.0985988	-23.8861273	50.2124715	7.0959852	16.6309382	50.0974218	66.7283600
2007	-12.5169061	115.1656989	-25.0603889	90.1053100	9.7648568	23.2800824	72.3043660	95.5844484
2008	-13.8809446	121.8862611	-29.0198140	92.8664471	9.9459461	26.2035451	75.4497912	101.6533364
2009	-10.4812491	93.6584499	-25.6776114	67.9808385	7.4589135	17.2455983	69.0475734	86.2931716
2010	-13.8211960	105.7282121	-26.2504816	79.4777305	8.4190919	23.3896410	68.6053743	91.9950154
2011	-14.1584994	116.8141597	-28.7386599	88.0754999	9.7234628	25.0573554	85.2820471	110.3394025
2012	-13.8982775	124.5818026	-25.6245942	98.9572084	9.3577572	24.8615134	87.5384375	112.3999509
2013	-14.3636831	155.6115832	-25.5768325	130.0347508	13.0206940	32.5159074	99.1770155	131.6929229
2014	-14.7790803	246.0395209	-24.7871529	221.2523680	1.7432546	25.9309663	7.7138466	33.6448128
2015	<b>-11.9967208</b>	<b>196.1214496</b>	<b>-20.2552855</b>	<b>175.8661641</b>	<b>16.1429624</b>	<b>39.8060405</b>	<b>119.3785172</b>	<b>159.1845577</b>
2016	-11.9620031	196.1704943	-20.1721469	175.9983474	16.0500822	39.7127417	119.0110019	158.7237435
2017	-13.3598762	202.8659696	-22.8536636	180.0123060	8.3289345	31.5946894	131.1465047	162.7411941
2018	-14.5380652	217.2907846	-24.9039603	192.3868243	8.3289345	29.2079973	131.1465047	160.3545020
2019	-14.2572190	201.6403259	-22.9936882	178.6466378	8.1619758	29.9235029	131.1465256	161.0700285
2020	-14.5906910	207.4811709	-23.6182939	183.8628770	8.1619758	29.9634908	131.1465256	161.1100164
2021	-14.3714497	208.0031934	-23.2593917	184.7438017	8.1619758	31.7853712	131.1465256	162.9318968
2022	-14.7118974	208.4884948	-23.7429243	184.7455705	8.1619758	30.6555086	131.1465005	161.8020091
2023	-14.7161654	211.4525678	-23.7553889	187.6971790	8.1619758	31.7684417	131.1465005	162.9149422
2024	-14.9694008	205.8124399	-24.1656995	181.6467404	8.1619758	29.6907138	131.1465256	160.8372394
2025	-14.6844037	208.6020563	-23.7828148	184.8192415	8.1619758	29.6340311	131.1465256	160.7805567
2026	-14.3876216	204.3700488	-23.2885319	181.0815169	8.1619758	29.6911902	131.1465256	160.8377157
2027	-14.9601339	207.3567204	-24.2340229	183.1226976	8.1619758	27.7521699	131.1465256	158.8986955
2028	-14.5049251	208.0997358	-23.4080124	184.6917234	8.1619758	32.0916364	131.1465005	163.2381369
2029	-14.9179504	210.9246470	-24.0857073	186.8389397	8.1619758	32.4171517	131.1465005	163.5635625
2030	-14.4111385	202.4189037	-23.2523334	179.1665703	8.1619758	27.3766772	131.1465256	158.5232028
2031	-16.5266991	220.4683910	-26.8372338	193.6311572	8.1619758	30.7860994	131.1465256	161.9326250
2032	-13.7212275	195.7258392	-22.1928873	173.5329519	8.1619758	27.6113885	131.1465256	158.7579141
2033	-16.2738531	223.6352760	-26.3242701	197.3110059	8.1619758	34.3976653	131.1465005	165.5441658
2034	-13.7369394	198.5074815	-22.2062419	176.3010595	8.1619758	28.7174087	131.1465005	159.8639092
2035	-21.8356579	251.9202910	-35.6707528	216.2495382	8.1619758	40.8174677	131.1465005	171.9639682

## Tables B-18 through B-31

Note: Where applicable, the projected data values shown in this appendix are shaded and the bill year data are in **bold** type.

**TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	2,051	34,919	0	36,970	0	0	0
1963	0	0	0	7,900	49,811	0	57,711	0	0	0
1964	0	0	0	5,931	68,203	0	74,134	0	0	0
1965	0	0	0	10,918	68,765	62,926	142,609	0	0	0
1966	0	0	0	19,330	52,135	121,141	192,605	0	0	0
1967	0	0	0	19,958	53,785	163,255	236,998	0	0	0
1968	6,989	0	6,989	29,899	120,985	341,768	492,653	0	0	0
1969	8,551	0	8,551	31,859	3,904	298,968	334,730	0	0	0
1970	13,598	0	13,598	49,687	0	431,443	481,130	0	0	0
1971	10,609	0	10,609	23,842	28,328	416,329	468,499	0	0	0
1972	14,434	0	14,434	54,838	144,669	524,208	723,714	0	0	0
1973	14,449	0	14,449	18,398	15,590	547,807	581,795	0	0	0
1974	17,473	0	17,473	9,499	29	636,186	645,715	0	0	0
1975	14,779	0	14,779	22,318	4,765	425,284	452,367	0	0	0
1976	20,856	0	20,856	97,874	121,693	502,769	722,336	0	0	0
1977	22,635	0	22,635	82,578	123,044	497,792	703,414	0	0	0
1978	21,692	0	21,692	74,911	39,986	652,860	767,757	0	0	0
1979	16,237	0	16,237	137,101	77,145	652,629	866,875	0	0	0
1980	19,945	0	19,945	98,743	64,891	517,531	681,165	0	0	0
1981	23,842	0	23,842	126,437	141,456	567,968	835,862	0	0	0
1982	12,157	0	12,157	97,117	46,742	651,246	795,104	0	0	0
1983	2,342	0	2,342	8,171	5,412	148,743	162,326	0	0	0
1984	4,822	0	4,822	26,707	13,141	349,314	389,163	0	0	0
1985	10,188	0	10,188	79,863	102,790	466,291	648,944	0	0	0
1986	15,501	0	15,501	112,370	131,118	932,090	1,175,577	0	0	0
1987	27,223	0	27,223	216,211	234,290	812,631	1,263,131	0	0	0
1988	31,265	11,533	42,798	229,578	297,129	779,537	1,306,245	0	0	0
1989	37,874	66,850	104,724	306,533	304,275	1,051,562	1,662,370	0	0	0
1990	54,736	105,421	160,157	524,114	502,545	1,456,008	2,482,667	0	0	0
1991	8,159	18,824	26,983	105,736	142,105	316,839	564,680	0	(2,636)	(2,636)
1992	12,515	23,808	36,323	93,772	122,436	273,849	490,058	0	0	0
1993	(7,223)	(17,293)	(24,516)	(36,162)	(12,912)	(78,024)	(127,098)	0	0	0
1994	39,106	77,257	116,363	231,800	257,533	642,006	1,131,340	0	0	0
1995	15,701	36,724	52,425	160,663	93,610	151,287	405,560	0	0	0
1996	31,526	96,570	128,096	214,883	186,694	735,431	1,137,008	502	0	502
1997	29,683	116,555	146,238	351,185	219,799	812,861	1,483,845	34,932	233,584	268,516
1998	(6,622)	(19,825)	(26,447)	(8,777)	(18,989)	(72,459)	(100,225)	(17,211)	(89,207)	(106,418)
1999	15,783	52,547	68,330	251,523	188,675	432,833	873,031	52,855	284,356	337,211
2000	22,904	104,450	127,354	360,156	227,824	718,954	1,306,935	73,133	419,770	492,903
2001	307,892	597,483	905,375	1,693,190	999,457	2,476,925	5,169,572	532,799	2,356,856	2,889,655
2002	96,918	303,383	400,302	1,067,733	640,899	1,453,943	3,162,575	245,579	1,558,397	1,803,976
2003	137,228	293,129	430,357	1,077,542	648,145	2,302,401	4,028,088	288,179	1,745,253	2,033,432
2004	151,816	410,075	561,891	1,322,362	623,001	1,609,900	3,555,263	289,108	2,061,934	2,351,042
2005	198,923	444,172	643,095	1,474,474	843,629	2,478,455	4,796,559	347,966	1,908,246	2,255,742
2006	185,423	343,688	529,111	1,255,253	709,977	2,100,005	4,065,234	280,860	1,553,103	1,833,962
2007	357,069	720,942	1,078,010	1,588,679	887,548	2,667,868	5,144,095	360,927	2,651,513	3,012,439
2008	392,341	547,572	939,913	1,490,633	730,439	1,845,644	4,066,716	345,825	1,869,710	2,215,534
2009	244,254	332,571	576,825	924,091	549,365	1,702,524	3,175,980	327,988	1,333,281	1,661,269
2010	289,402	323,888	613,290	1,417,276	659,143	2,034,184	4,110,603	345,625	1,635,211	1,980,837
2011	316,311	332,644	648,955	1,746,317	947,093	2,957,132	5,650,542	421,386	2,361,715	2,783,101
2012	272,987	362,191	635,178	1,812,951	688,011	2,472,397	4,973,359	443,305	2,188,877	2,632,182
2013	485,007	639,621	1,124,628	2,247,657	1,147,676	3,281,086	6,676,419	484,762	2,372,843	2,857,605
2014	642,676	533,051	1,175,727	2,054,499	1,036,354	3,736,465	6,827,317	249,544	498,515	748,059
2015	572,953	494,501	1,067,454	2,569,467	1,424,201	3,867,440	7,861,108	2,161,726	4,344,465	6,506,191
2016	562,887	486,805	1,049,692	2,805,935	1,399,926	3,969,588	8,175,449	2,155,468	4,331,888	6,487,357
2017	849,018	653,608	1,502,626	2,844,397	1,417,815	4,024,000	8,286,212	2,210,025	4,441,533	6,651,558
2018	849,018	653,608	1,502,626	2,707,227	1,347,163	3,829,945	7,884,335	2,177,614	4,376,395	6,554,009
2019	851,267	656,153	1,507,420	2,770,012	1,443,102	3,435,957	7,649,071	1,992,919	4,395,923	6,388,843
2020	851,267	656,153	1,507,420	2,764,482	1,440,221	3,429,098	7,633,802	1,993,414	4,397,015	6,390,429
2021	851,267	656,153	1,507,420	2,854,288	1,487,008	3,540,494	7,881,790	2,015,956	4,446,737	6,462,694
2022	851,267	656,153	1,507,420	2,797,496	1,457,421	3,470,049	7,724,966	2,001,976	4,415,900	6,417,877
2023	851,267	656,153	1,507,420	2,848,968	1,484,236	3,533,896	7,867,100	2,015,747	4,446,275	6,462,021
2024	851,267	656,153	1,507,420	2,753,031	1,434,256	3,414,894	7,602,181	1,990,039	4,389,570	6,379,609
2025	851,267	656,153	1,507,420	2,746,703	1,430,959	3,407,045	7,584,706	1,989,338	4,388,023	6,377,361
2026	851,267	656,153	1,507,420	2,755,001	1,435,282	3,417,338	7,607,622	1,990,045	4,389,583	6,379,628
2027	851,267	656,153	1,507,420	2,654,856	1,383,109	3,293,117	7,331,082	1,966,054	4,336,663	6,302,717
2028	851,267	656,153	1,507,420	2,869,335	1,494,847	3,559,159	7,923,341	2,019,745	4,455,095	6,474,841
2029	851,267	656,153	1,507,420	2,881,853	1,501,368	3,574,687	7,957,908	2,023,773	4,463,979	6,487,752
2030	851,267	656,153	1,507,420	2,642,526	1,376,686	3,277,823	7,297,035	1,961,408	4,326,415	6,287,823
2031	851,267	656,153	1,507,420	2,788,930	1,452,958	3,459,424	7,701,311	2,003,592	4,419,465	6,423,058
2032	851,267	656,153	1,507,420	2,663,086	1,387,397	3,303,325	7,353,808	1,964,312	4,332,821	6,297,133
2033	851,267	656,153	1,507,420	2,964,097	1,544,216	3,676,704	8,185,016	2,048,278	4,518,031	6,566,309
2034	851,267	656,153	1,507,420	2,714,360	1,414,109	3,366,927	7,495,396	1,977,996	4,363,006	6,341,002
2035	851,267	656,153	1,507,420	3,248,473	1,692,368	4,029,447	8,970,289	2,127,710	4,693,241	6,820,951
TOTAL	21,967,382	20,300,957	42,268,339	84,066,693	45,817,705	126,041,148	255,925,546	47,894,732	119,613,344	167,508,076

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

**TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor<sup>a</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	68,977	5,176	0	0	440,922	2,355	4,760	65,680	587,871
1969	56,774	101	0	0	321,387	181	3,338	17,956	399,737
1970	69,818	6,811	0	0	470,867	0	5,595	16,550	569,641
1971	53,097	7,747	0	0	731,754	4,785	6,353	158,419	962,156
1972	62,365	8,515	0	0	1,117,237	2,057	7,375	379,686	1,577,235
1973	33,931	4,615	0	0	751,373	2,307	3,017	77,630	872,873
1974	49,114	4,413	0	45,531	666,973	2,206	3,114	106,332	877,685
1975	63,140	4,671	0	33,862	838,135	2,491	3,920	134,295	1,080,514
1976	70,851	5,132	0	93,991	957,767	2,737	4,910	100,597	1,235,984
1977	26,565	1,758	0	83,339	493,847	3,644	2,602	43,067	654,822
1978	108,944	938	0	188,966	1,605,431	4,319	6,294	24,901	1,939,793
1979	107,956	4,871	0	193,260	2,356,542	5,602	13,172	434,472	3,115,874
1980	88,746	1,935	0	121,603	1,731,588	4,762	7,766	163,301	2,119,700
1981	129,687	18,533	0	259,802	2,401,614	7,275	8,904	263,922	3,089,736
1982	108,561	937	0	138,432	2,382,218	4,541	6,763	48,137	2,689,589
1983	61,443	0	0	13,954	929,183	5,662	3,232	1,218	1,014,692
1984	82,423	0	0	172,730	2,039,966	5,946	7,475	10,496	2,319,036
1985	114,571	12,938	0	228,121	2,581,708	8,422	8,815	271,970	3,226,546
1986	236,756	5,513	0	377,798	4,876,960	17,433	16,927	376,088	5,907,475
1987	187,090	10,273	0	491,023	4,244,094	16,140	15,529	375,604	5,339,754
1988	188,170	14,894	0	494,958	4,280,201	15,528	11,928	374,528	5,380,208
1989	285,261	15,450	0	656,118	6,183,768	20,063	21,693	649,604	7,831,958
1990	218,786	7,710	0	817,290	4,806,772	12,056	12,072	344,008	6,218,694
1991	4,393	1,047	0	185,013	47,869	0	521	10,331	249,174
1992	76,840	4,426	0	217,223	1,709,933	6,059	5,222	151,055	2,170,758
1993	20,064	4,843	0	48,161	371,012	2,090	1,467	123,913	571,550
1994	135,626	7,854	0	461,574	3,427,557	9,967	10,102	293,748	4,346,429
1995	181,772	4,611	0	401,880	3,445,511	11,619	10,492	288,010	4,343,895
1996	286,064	9,577	0	710,852	6,333,517	21,039	16,403	1,196,303	8,573,755
1997	308,515	0	0	557,650	5,720,501	0	15,559	94,838	6,697,062
1998	16,993	(54)	0	(16,341)	91,651	(2)	1,171	(2,095)	91,324
1999	191,682	10,198	0	463,890	3,954,090	12,844	11,542	937,238	5,581,485
2000	187,499	5,572	0	145,048	4,094,882	11,150	9,981	614,208	5,068,338
2001	795,346	25,814	0	157,947	11,972,552	29,611	46,224	1,130,552	14,158,047
2002	425,664	12,226	0	183,569	8,013,780	24,836	29,691	839,772	9,529,537
2003	453,879	14,144	0	493,783	9,972,811	36,364	28,706	1,042,468	12,042,155
2004	519,124	37,676	0	1,403,068	8,919,108	95,754	33,583	859,466	11,867,780
2005	971,096	45,499	0	831,145	17,526,571	235,043	33,805	1,661,442	21,304,601
2006	687,279	31,294	0	951,319	13,200,756	90,868	27,782	1,031,749	16,021,047
2007	610,010	28,166	0	759,962	11,917,871	78,137	32,402	1,176,946	14,603,493
2008	360,496	15,396	0	717,226	7,301,946	62,364	23,358	551,198	9,031,984
2009	207,662	10,119	0	72,202	5,595,010	33,187	12,665	360,191	6,291,036
2010	443,661	48,789	0	155,584	9,826,062	72,371	31,663	860,269	11,438,399
2011	930,565	29,364	0	708,255	19,753,962	102,843	29,285	848,511	22,402,787
2012	283,936	34,759	0	565,670	12,203,953	114,805	34,314	1,383,791	14,621,228
2013	527,268	30,549	0	660,629	12,763,967	90,555	38,551	860,047	14,971,566
2014	330,571	11,296	0	371,403	11,591,930	23,778	25,107	220,108	12,574,193
<b>2015</b>	<b>714,980</b>	<b>42,594</b>	<b>0</b>	<b>2,172,425</b>	<b>15,498,579</b>	<b>135,065</b>	<b>55,541</b>	<b>1,241,909</b>	<b>19,861,093</b>
2016	714,967	42,593	0	2,172,419	15,493,426	135,046	55,559	1,241,887	19,855,898
2017	702,975	41,878	0	2,147,069	14,925,294	131,417	54,939	1,221,057	19,224,629
2018	630,861	37,582	0	1,983,208	13,939,763	118,092	45,241	1,095,796	17,850,543
2019	565,930	39,171	0	2,104,788	14,124,612	122,988	49,676	1,161,043	18,168,207
2020	566,970	39,243	0	2,120,847	14,222,493	123,212	49,285	1,163,176	18,285,225
2021	614,350	42,522	0	2,259,494	15,137,657	133,383	55,635	1,260,379	19,503,420
2022	584,967	40,488	0	2,175,435	14,581,604	127,075	51,619	1,200,097	18,761,286
2023	613,910	42,492	0	2,268,072	15,176,132	133,289	55,259	1,259,476	19,546,629
2024	559,876	38,752	0	2,096,622	14,064,766	121,689	48,475	1,148,623	18,078,803
2025	558,402	38,650	0	2,098,489	14,073,210	121,372	48,028	1,145,599	18,083,750
2026	559,889	38,753	0	2,093,289	14,044,870	121,691	48,615	1,148,648	18,055,754
2027	509,463	35,262	0	1,953,690	13,118,434	110,866	41,534	1,045,196	16,814,445
2028	622,315	43,073	0	2,282,918	15,292,195	135,093	56,699	1,276,719	19,709,012
2029	630,780	43,659	0	2,313,846	15,492,474	136,910	57,584	1,294,086	19,969,340
2030	499,698	34,586	0	1,914,346	12,865,486	108,769	40,662	1,025,162	16,488,709
2031	588,363	40,723	0	2,212,090	14,806,539	127,804	51,014	1,207,065	19,033,598
2032	505,801	35,009	0	1,916,873	12,891,645	110,080	42,116	1,037,685	16,539,208
2033	682,285	47,224	0	2,491,867	16,650,176	147,967	63,399	1,399,753	21,482,671
2034	534,565	37,000	0	2,006,611	13,480,529	116,255	45,741	1,096,694	17,317,394
2035	849,239	58,780	0	3,039,700	20,227,402	183,809	83,505	1,742,268	26,184,704
<b>TOTAL</b>	<b>24,239,617</b>	<b>1,426,131</b>	<b>0</b>	<b>61,439,589</b>	<b>547,074,396</b>	<b>4,017,668</b>	<b>1,795,275</b>	<b>46,384,837</b>	<b>686,377,514</b>

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

**TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor<sup>a</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	30,401	0	0	0	0	0	0	0	0
1969	0	30,627	0	0	0	0	0	0	0	0
1970	0	39,430	0	0	0	0	0	0	0	0
1971	0	34,871	0	0	0	0	0	0	0	0
1972	710	47,571	0	6,602	0	4,156	783	0	15,117	0
1973	270	28,968	96,209	6,453	149,289	3,687	0	0	249,193	0
1974	15,040	28,982	96,540	9,458	150,844	4,770	211	0	161,738	5,961
1975	97,373	28,568	105,611	12,447	165,961	6,274	0	0	129,042	50,723
1976	379,830	38,365	132,461	17,464	209,148	8,052	0	0	132,365	65,476
1977	194,137	21,006	0	22,635	0	1,924	1,633	0	206,587	74,838
1978	572,290	45,550	170,805	20,478	259,155	2,686	0	0	35,203	67,462
1979	1,045,698	83,936	225,048	28,179	335,459	2,299	89,456	0	228	3,668
1980	1,390,117	51,143	256,759	29,229	401,038	3,667	94,362	0	0	16,504
1981	1,480,362	118,583	274,149	33,632	430,304	23,861	90,590	0	254,649	57,523
1982	923,973	132,575	292,674	27,190	461,216	0	230,608	0	126,461	189,895
1983	333,772	(335,712)	172,336	10,792	272,477	385	0	0	(71,602)	(8,768)
1984	485,847	(142,910)	273,597	19,572	433,785	15	0	0	(66,353)	(91,433)
1985	821,069	(335,343)	413,406	34,603	657,011	0	0	32,464	(47,544)	(32,348)
1986	1,109,047	54,812	728,808	60,274	1,160,650	5,548	0	105,375	69,170	101,843
1987	1,019,605	(40,745)	668,383	63,601	1,083,530	32,651	585	157,843	88,076	49,930
1988	1,019,793	(74,006)	688,891	66,914	1,134,141	11,991	300	50,654	92,465	38,688
1989	1,736,901	178,359	978,885	97,114	1,633,489	38,269	8,951	350,953	340,460	210,334
1990	2,442,558	422,502	1,402,619	110,934	2,313,410	90,472	0	446,408	599,573	530,099
1991	286,485	(3,054)	277,078	33,945	456,999	17,978	128,405	132,700	35,339	52,116
1992	587,340	(208,900)	240,119	11,952	396,022	4,871	241,338	78,306	(22,718)	(53,500)
1993	(190,611)	(491,161)	(809,033)	(2,389)	(1,334,429)	(3,246)	(61,112)	(29,466)	(157,452)	(519,798)
1994	1,841,902	66,338	189,616	34,480	312,714	41,201	731,185	315,446	122,829	204,783
1995	761,209	(247,735)	(251,547)	7,960	(414,889)	7,727	165,622	114,342	(7,579)	(140,714)
1996	1,883,530	72,171	508,274	18,313	838,330	16,510	289,044	385,745	49,537	133,848
1997	2,121,818	22,440	365,342	24,076	330,153	15,099	414,596	438,212	61,553	115,882
1998	(577,005)	(733,387)	(3,979,131)	(2,991)	(3,279,862)	(4,405)	(46,209)	(84,367)	(87,188)	(432,227)
1999	1,250,830	(475,206)	(683,915)	18,893	(787,153)	6,193	172,541	252,025	(174,420)	(244,303)
2000	1,649,757	(400,024)	(481,259)	22,583	(662,184)	0	268,269	178,839	(209,217)	(172,158)
2001	10,865,814	4,504,776	1,516,404	208,799	2,501,234	0	859,787	1,807,596	4,413,902	393,265
2002	3,940,463	1,972,885	737,668	162,408	1,216,898	0	332,517	1,250,856	3,146,931	1,094,108
2003	5,102,914	3,155,422	908,048	145,766	1,497,528	0	1,429,999	981,581	1,641,755	1,379,016
2004	5,204,461	3,238,845	1,014,120	192,203	1,389,538	0	1,340,546	1,058,862	3,796,147	822,378
2005	5,975,183	2,997,184	3,435,143	89,645	3,965,938	0	1,575,081	1,169,650	2,641,416	1,129,778
2006	6,404,646	2,245,537	7,042,283	56,378	2,907,631	0	3,164,572	995,308	2,174,900	946,957
2007	9,368,747	4,241,036	7,370,339	231,158	3,043,028	0	6,183,023	2,224,013	6,102,640	405,012
2008	5,830,288	3,803,094	4,861,729	115,081	2,637,747	3,036	3,552,073	1,731,168	4,102,464	756,866
2009	4,072,092	2,501,217	3,307,596	94,600	1,324,211	3,837	3,165,316	1,401,244	3,325,598	835,265
2010	6,228,321	2,814,436	7,586,439	42,405	2,809,678	0	4,695,219	1,168,056	4,865,600	1,728,173
2011	11,035,494	2,813,284	9,115,562	62,079	3,673,224	0	658,825	1,227,717	3,588,556	2,382,007
2012	10,686,659	3,822,110	12,516,520	85,859	4,824,551	0	1,646,578	2,118,193	10,602,552	2,359,592
2013	7,914,328	6,161,366	9,070,821	235,192	2,934,810	0	1,328,879	1,638,935	5,054,813	1,305,991
2014	3,925,828	7,905,670	2,885,038	587,943	690,519	26,694	688,085	1,656,169	4,436,859	277,224
<b>2015</b>	<b>16,297,895</b>	<b>9,773,355</b>	<b>14,784,996</b>	<b>736,096</b>	<b>5,957,814</b>	<b>258,766</b>	<b>9,879,919</b>	<b>2,396,400</b>	<b>10,966,185</b>	<b>3,077,758</b>
2016	16,303,910	9,780,454	14,805,790	736,291	5,966,193	258,862	9,982,869	2,397,286	10,981,596	3,082,087
2017	16,852,477	9,985,468	15,374,246	748,875	6,195,260	267,604	10,211,903	2,478,248	11,403,000	3,200,421
2018	18,029,630	10,662,778	16,594,930	804,384	6,687,151	286,297	10,959,549	2,651,355	12,308,319	3,454,528
2019	16,432,314	7,425,563	15,327,153	746,183	6,176,283	267,287	12,009,163	2,475,306	11,374,319	3,190,618
2020	16,901,025	7,679,374	15,736,238	767,885	6,341,129	274,911	12,448,134	2,545,911	11,678,035	3,275,776
2021	16,945,187	7,875,169	15,828,990	769,508	6,378,505	275,629	12,471,708	2,552,563	11,746,651	3,295,084
2022	16,988,909	8,002,262	15,919,810	771,493	6,415,102	276,340	12,504,031	2,559,150	11,813,867	3,313,990
2023	17,229,936	8,272,859	16,117,405	782,662	6,494,726	280,261	12,687,536	2,595,457	11,960,618	3,355,123
2024	16,779,752	8,131,432	15,627,516	760,922	6,297,318	272,938	12,323,992	2,527,643	11,597,228	3,253,144
2025	16,988,125	8,397,404	15,907,399	772,144	6,410,101	276,327	12,519,743	2,559,032	11,804,751	3,311,407
2026	16,648,326	8,314,608	15,500,376	756,183	6,246,086	270,800	12,255,974	2,507,845	11,502,986	3,226,678
2027	16,886,844	8,477,896	15,785,602	767,540	6,361,021	274,680	12,444,748	2,543,775	11,714,463	3,286,052
2028	16,960,763	8,682,032	15,818,558	769,725	6,374,302	275,882	12,471,608	2,554,910	11,738,964	3,292,913
2029	17,198,490	8,896,957	16,086,700	779,880	6,482,353	279,749	12,632,158	2,590,720	11,937,735	3,348,731
2030	16,481,974	8,583,949	15,359,177	749,722	6,189,188	268,994	12,158,901	2,482,787	11,398,232	3,197,284
2031	17,981,281	9,447,772	16,898,645	814,559	6,809,537	292,482	13,190,333	2,708,637	12,539,920	3,517,752
2032	15,935,336	8,585,833	14,815,231	724,550	5,969,997	259,203	11,746,673	2,400,443	10,994,666	3,084,052
2033	18,249,015	9,931,029	17,106,111	826,161	6,893,138	296,837	13,375,113	2,748,968	12,693,993	3,560,940
2034	16,160,140	8,978,481	15,071,648	734,948	6,073,324	262,859	11,917,266	2,434,307	11,184,798	3,137,430
2035	20,643,052	11,206,148	19,446,038	925,383	7,836,043	335,778	14,919,833	3,109,597	14,429,361	4,048,037
<b>TOTAL</b>	<b>480,133,264</b>	<b>237,356,699</b>	<b>407,632,991</b>	<b>19,399,006</b>	<b>177,077,715</b>	<b>6,187,787</b>	<b>288,552,810</b>	<b>77,175,167</b>	<b>309,589,330</b>	<b>85,599,766</b>

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.



**TABLE B-18 Variable OMP&R Component of Transportation Charge for Each Contractor<sup>a</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	36,970
1963	0	0	0	0	0	0	0	0	0	57,711
1964	0	0	0	0	0	0	0	0	0	74,134
1965	0	0	0	0	0	0	0	0	0	142,609
1966	0	0	0	0	0	0	0	0	0	192,605
1967	0	0	0	0	0	0	0	0	0	236,998
1968	0	0	0	30,401	0	0	0	0	0	1,117,913
1969	0	0	0	30,627	0	0	0	0	0	773,646
1970	0	0	0	39,430	0	0	0	0	0	1,103,798
1971	0	0	0	34,871	0	0	0	0	0	1,476,135
1972	0	752,580	0	827,518	0	0	0	0	0	3,142,901
1973	0	942,905	0	1,476,973	0	0	0	0	0	2,946,091
1974	0	1,683,743	0	2,157,288	0	0	0	0	0	3,698,160
1975	0	3,687,903	0	4,283,902	0	0	0	0	0	5,831,562
1976	0	5,253,329	0	6,236,491	0	0	0	0	0	8,215,667
1977	0	(977,112)	0	(454,352)	0	0	0	0	0	926,518
1978	0	3,468,162	0	4,641,791	0	0	0	0	0	7,371,033
1979	0	3,795,878	0	5,609,848	0	0	0	0	0	9,608,834
1980	0	5,362,245	0	7,605,063	0	0	0	0	0	10,425,874
1981	0	10,862,932	0	13,626,585	0	0	0	0	0	17,576,025
1982	0	7,685,168	0	10,069,760	0	0	0	0	0	13,566,611
1983	0	(8,994,497)	0	(8,620,817)	0	0	0	0	0	(7,441,457)
1984	0	(7,633,741)	0	(6,721,621)	0	0	0	0	0	(4,008,600)
1985	0	(15,213,299)	0	(13,669,983)	0	0	0	0	0	(9,784,305)
1986	0	1,135,478	0	4,531,004	0	0	0	0	0	11,629,557
1987	0	(3,007,097)	0	116,362	0	0	0	0	0	6,746,469
1988	0	(3,407,929)	0	(378,098)	0	0	0	0	0	6,351,153
1989	0	9,488,536	0	15,062,251	0	0	0	0	0	24,661,303
1990	0	30,759,725	204,582	39,322,883	0	0	0	0	0	48,184,400
1991	0	184,870	22,623	1,625,484	0	0	0	0	0	2,463,685
1992	0	(9,471,028)	0	(8,196,199)	0	0	0	0	0	(5,499,060)
1993	0	(21,473,875)	0	(25,072,572)	0	0	0	0	0	(24,652,636)
1994	0	4,059,683	0	7,920,180	0	0	0	0	0	13,514,311
1995	0	(4,895,977)	0	(4,901,580)	0	0	0	0	0	(99,701)
1996	0	1,859,275	0	6,054,578	0	0	0	0	0	15,893,939
1997	0	2,428,729	(921)	6,336,978	0	0	0	0	0	14,932,640
1998	0	(14,593,773)	(68,568)	(23,889,113)	0	0	0	0	0	(24,030,879)
1999	0	(9,859,076)	(31,704)	(10,555,295)	0	0	0	0	0	(3,695,239)
2000	0	(16,720,534)	1,343	(16,524,585)	0	0	0	0	0	(9,529,054)
2001	0	160,090,738	269,117	187,431,433	0	0	0	0	0	210,554,082
2002	0	59,840,151	279,773	73,974,657	0	0	0	0	0	88,871,047
2003	7,293	94,397,023	358,241	111,004,588	0	0	0	0	0	129,538,621
2004	97,767	106,695,328	415,475	125,265,670	0	0	0	0	0	143,601,645
2005	83,957	113,376,456	122,591	136,562,022	0	0	0	0	0	165,562,019
2006	438,720	82,894,100	92,893	109,363,926	0	0	0	0	0	131,813,281
2007	613,403	137,976,654	317,680	178,076,733	0	0	0	0	0	201,914,771
2008	742,053	84,139,470	410,166	112,685,235	0	0	0	0	0	128,939,381
2009	727,013	58,862,842	345,392	79,966,221	0	0	0	0	0	91,671,331
2010	1,114,465	90,902,572	406,561	124,361,926	0	0	0	0	0	142,505,055
2011	1,561,724	131,575,741	424,723	168,118,937	0	0	0	0	0	199,604,323
2012	1,758,998	111,537,942	511,478	162,471,031	0	0	0	0	0	185,332,978
2013	1,964,653	116,610,113	433,144	154,653,044	0	0	0	0	0	180,283,261
2014	2,114,450	101,911,388	243,734	127,349,601	0	0	0	0	0	148,674,897
<b>2015</b>	<b>2,952,321</b>	<b>198,586,589</b>	<b>565,881</b>	<b>276,233,977</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>311,529,823</b>
2016	2,990,758	198,795,668	566,120	276,647,884	0	0	0	0	0	312,216,280
2017	3,177,384	204,750,358	583,230	285,228,475	0	0	0	0	0	320,893,500
2018	3,334,010	219,771,435	624,229	306,168,594	0	0	0	0	0	339,960,107
2019	3,167,014	202,481,868	1,651,278	282,724,349	0	0	0	0	0	316,437,889
2020	3,218,168	208,096,910	1,699,404	290,662,900	0	0	0	0	0	324,479,775
2021	3,229,766	209,283,138	1,706,654	292,358,551	0	0	0	0	0	327,713,874
2022	3,241,122	209,889,593	1,707,584	293,403,254	0	0	0	0	0	327,814,802
2023	3,265,831	212,866,348	1,734,172	297,642,933	0	0	0	0	0	333,026,103
2024	3,204,572	206,166,300	1,680,494	288,623,251	0	0	0	0	0	322,191,263
2025	3,239,571	209,800,193	1,708,323	293,694,519	0	0	0	0	0	327,247,756
2026	3,188,674	204,966,749	1,673,749	287,059,035	0	0	0	0	0	320,609,458
2027	3,224,340	207,983,281	1,693,907	291,444,149	0	0	0	0	0	323,399,813
2028	3,228,461	209,193,412	1,706,467	293,067,996	0	0	0	0	0	328,682,609
2029	3,261,991	212,228,742	1,727,072	297,451,279	0	0	0	0	0	333,373,698
2030	3,171,018	202,882,125	1,656,446	284,578,895	0	0	0	0	0	316,159,882
2031	3,363,521	221,470,315	1,793,403	310,828,158	0	0	0	0	0	345,493,544
2032	3,103,000	196,099,131	1,603,741	275,321,858	0	0	0	0	0	307,019,426
2033	3,389,464	224,988,408	1,825,552	315,884,728	0	0	0	0	0	353,626,145
2034	3,135,064	199,400,907	1,628,680	280,119,853	0	0	0	0	0	312,781,064
2035	3,682,060	251,715,860	2,013,664	354,310,853	0	0	0	0	0	397,794,215
<b>TOTAL</b>	<b>78,992,605</b>	<b>5,839,391,051</b>	<b>36,308,374</b>	<b>8,043,396,567</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,195,476,041</b>

(a) B-18 includes Extra Peaking Charges for additional power shown in Table 9.

**TABLE B-19 Total Transportation Charge for Each Contractors <sup>a</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	21,132	76,669	0	0	0
1963	0	0	0	199,726	190,272	447,723	837,721	0	0	0
1964	0	0	0	263,282	277,455	621,356	1,162,093	6,696	21,667	28,363
1965	0	0	0	373,816	404,324	1,158,090	1,936,230	13,756	36,029	49,785
1966	18,063	0	18,063	419,467	421,723	1,412,953	2,254,143	26,524	61,349	87,873
1967	41,574	0	41,574	539,115	498,441	1,686,099	2,723,655	56,469	118,263	174,731
1968	128,628	0	128,628	663,852	603,483	1,985,221	3,252,556	115,961	229,807	345,768
1969	254,715	0	254,715	787,401	539,340	2,083,253	3,409,994	185,156	358,861	544,017
1970	277,547	0	277,547	823,176	532,567	2,202,766	3,558,510	200,150	387,675	587,825
1971	227,474	0	227,474	788,298	552,114	2,169,897	3,510,309	202,413	392,912	595,325
1972	224,978	0	224,978	830,079	678,519	2,320,420	3,829,018	209,057	406,589	615,646
1973	221,091	31,366	252,457	795,368	549,393	2,338,620	3,683,381	206,557	402,724	609,281
1974	240,498	32,938	273,437	819,207	564,593	2,506,359	3,890,159	208,545	407,090	615,635
1975	237,459	36,291	273,750	869,169	605,731	2,409,923	3,884,823	225,895	439,873	665,768
1976	271,292	40,836	312,127	959,986	734,812	2,500,505	4,195,303	228,976	447,299	676,275
1977	293,627	45,096	338,723	924,224	713,558	2,476,399	4,114,181	238,699	468,721	707,420
1978	273,870	49,178	323,048	979,647	692,587	2,785,987	4,458,221	245,331	484,259	729,590
1979	289,479	53,340	342,819	1,044,898	736,358	2,813,578	4,594,835	243,110	483,437	726,547
1980	310,846	67,748	378,594	1,162,998	866,372	3,028,205	5,057,575	269,858	537,074	806,932
1981	347,781	87,408	435,189	1,128,765	879,357	2,917,582	4,925,704	288,997	586,257	875,254
1982	438,335	106,918	545,254	1,166,741	850,482	3,262,104	5,279,327	290,049	582,757	872,806
1983	354,787	151,259	506,046	1,178,397	900,363	3,795,446	5,874,205	319,214	633,181	952,395
1984	467,336	224,245	691,581	1,470,602	1,097,481	5,737,801	8,305,884	351,620	695,559	1,047,179
1985	736,074	364,305	1,100,379	1,921,134	1,789,369	6,551,546	10,262,049	394,593	776,994	1,171,586
1986	1,084,728	692,479	1,777,207	1,748,425	1,528,732	6,863,230	10,140,386	385,545	762,684	1,148,229
1987	1,773,801	1,559,243	3,333,044	2,238,374	2,011,876	6,675,354	10,925,604	385,289	812,310	1,197,599
1988	2,231,563	2,333,792	4,565,355	2,240,092	2,210,523	6,368,850	10,819,465	420,153	978,621	1,398,774
1989	2,397,272	3,326,435	5,723,708	2,156,459	1,872,030	5,916,713	9,945,203	414,224	1,162,723	1,576,947
1990	2,746,135	3,433,320	6,179,455	2,575,822	2,261,914	6,668,440	11,506,176	487,609	1,234,409	1,722,018
1991	2,748,636	3,682,311	6,430,947	1,755,451	1,621,189	4,527,927	7,904,567	491,419	1,476,387	1,967,806
1992	2,554,529	3,528,957	6,083,486	2,076,631	2,003,328	5,385,858	9,465,817	551,042	1,491,156	2,042,198
1993	2,592,888	3,504,240	6,097,128	2,881,873	2,011,222	6,511,865	11,404,960	610,115	1,675,438	2,285,553
1994	2,718,328	3,537,460	6,255,788	2,908,624	2,642,460	7,314,515	12,865,599	767,900	2,473,449	3,241,348
1995	2,649,273	3,509,935	6,159,208	3,036,985	2,289,027	5,893,667	11,219,679	995,341	4,977,122	5,972,462
1996	2,699,210	3,891,715	6,590,926	2,586,128	2,137,443	6,675,492	11,399,062	1,837,383	13,766,531	15,603,915
1997	2,641,891	3,631,175	6,273,066	2,659,383	2,007,333	6,551,469	11,218,185	2,294,918	21,860,553	24,155,471
1998	2,538,764	3,478,062	6,016,827	2,265,780	2,064,166	6,296,050	10,625,996	2,976,896	26,690,793	29,667,689
1999	2,689,372	3,841,375	6,530,748	2,887,101	2,450,078	8,373,830	13,711,010	3,031,213	27,471,599	30,502,813
2000	2,833,448	4,318,306	7,151,754	3,899,130	2,293,264	6,997,582	13,189,977	2,946,561	27,902,696	30,849,257
2001	3,367,971	4,981,620	8,349,591	7,407,449	2,805,665	8,476,291	18,689,405	3,508,951	30,065,033	33,573,984
2002	3,560,718	5,085,056	8,645,773	10,845,603	2,776,879	9,918,512	23,540,993	3,215,772	29,687,112	32,902,884
2003	3,673,109	5,421,007	9,094,116	7,506,857	2,508,291	8,733,646	3,298,282	29,947,615	33,245,897	33,245,897
2004	4,153,705	5,673,129	9,826,835	5,705,530	2,812,013	8,201,355	16,718,898	3,310,073	30,388,459	33,698,531
2005	3,512,694	5,179,857	8,692,551	5,718,088	2,962,362	8,965,675	17,646,125	3,434,820	30,519,580	33,954,401
2006	3,435,347	4,681,447	8,116,794	5,634,015	2,928,321	9,020,779	17,583,114	3,273,111	30,134,913	33,408,024
2007	3,660,689	5,243,252	8,903,941	6,773,659	3,496,774	10,405,417	20,675,851	4,262,224	31,315,784	34,742,008
2008	4,335,993	5,118,604	9,454,597	7,578,258	3,767,617	10,517,248	21,863,124	3,916,294	32,537,512	36,453,806
2009	4,784,006	5,183,201	9,967,207	6,601,154	3,351,371	10,424,427	20,376,952	3,754,542	30,994,412	34,748,954
2010	5,028,005	6,574,828	11,602,833	7,468,938	3,699,552	11,252,613	22,421,103	4,103,006	33,172,692	37,275,698
2011	5,375,465	6,922,506	12,297,971	8,654,128	4,323,366	12,909,626	25,887,120	4,158,350	34,083,759	38,242,108
2012	5,788,044	6,761,400	12,549,444	9,571,087	4,343,511	15,225,605	29,140,203	4,233,543	34,766,847	39,000,391
2013	5,501,261	6,698,714	12,199,975	10,455,758	5,103,054	15,243,115	30,801,926	4,584,905	36,995,073	41,579,979
2014	6,135,340	7,626,744	13,762,084	10,410,788	4,994,012	15,621,389	31,026,189	4,705,772	35,001,730	39,707,502
<b>2015</b>	<b>6,177,810</b>	<b>7,779,360</b>	<b>13,957,170</b>	<b>11,116,697</b>	<b>5,465,429</b>	<b>17,236,954</b>	<b>33,819,079</b>	<b>6,338,675</b>	<b>38,261,290</b>	<b>44,599,965</b>
2016	6,155,205	7,733,126	13,888,331	11,410,132	5,455,955	17,812,330	34,678,416	6,378,552	38,569,733	44,948,285
2017	6,383,150	7,861,330	14,244,480	11,097,425	5,279,909	16,458,075	32,835,409	6,437,670	38,601,558	45,039,228
2018	6,301,881	7,894,347	14,196,228	10,845,317	5,169,187	16,157,688	32,172,193	6,347,556	38,482,656	44,830,212
2019	6,274,981	7,939,746	14,214,727	10,852,517	5,253,725	15,736,711	31,842,952	6,163,479	38,565,379	44,728,858
2020	6,292,069	7,983,526	14,275,595	10,864,109	5,260,793	15,774,803	31,899,705	6,182,131	38,660,075	44,842,206
2021	6,314,192	8,030,377	14,344,569	11,012,641	5,336,085	15,979,492	32,328,219	6,232,259	38,824,289	45,056,549
2022	6,333,225	8,073,955	14,407,180	11,003,322	5,328,269	15,983,965	32,315,556	6,236,142	38,886,322	45,122,464
2023	6,350,580	8,082,439	14,433,019	11,093,253	5,372,428	16,112,819	32,578,500	6,262,569	38,999,127	45,261,696
2024	6,366,904	8,124,043	14,490,947	11,040,307	5,341,975	16,065,439	32,447,721	6,251,815	39,030,585	45,282,400
2025	6,374,111	8,161,547	14,535,659	11,063,877	5,351,396	16,113,022	32,528,295	6,258,517	39,101,065	45,359,582
2026	6,391,089	8,202,916	14,594,005	11,125,209	5,380,450	16,208,182	32,713,841	6,280,860	39,205,445	45,486,304
2027	6,410,612	8,245,370	14,655,982	11,078,570	5,353,053	16,168,010	32,599,632	6,278,659	39,254,861	45,533,520
2028	6,428,825	8,287,451	14,716,276	11,341,275	5,486,788	16,511,807	33,339,871	6,347,581	39,463,280	45,810,861
2029	6,447,522	8,330,374	14,777,896	11,402,869	5,515,691	16,606,690	33,525,249	6,372,908	39,574,548	45,947,455
2030	6,458,445	8,361,910	14,820,356	11,211,339	5,412,931	16,388,833	33,013,103	6,329,736	39,534,363	45,864,099
2031	6,466,226	8,389,091	14,855,317	11,402,461	5,509,142	16,644,984	33,556,587	6,389,516	39,713,703	46,103,219
2032	6,476,368	8,416,885	14,893,253	11,335,942	5,471,660	16,583,248	33,390,849	6,374,130	39,744,972	46,119,102
2033	6,467,969	8,418,649	14,886,618	11,693,034	5,654,851	17,047,113	34,394,998	6,481,196	40,045,243	46,526,439
2034	6,418,769	8,391,738	14,810,507	11,488,767	5,545,108	16,812,837	33,846,713	6,432,814	39,997,780	46,430,593
2035	6,294,773	8,295,649	14,590,422	12,067,552	5,843,544	17,551,198	35,462,294	6,604,526	40,436,902	47,041,428
<b>TOTAL</b>	<b>238,452,349</b>	<b>301,714,927</b>	<b>540,167,275</b>	<b>403,915,279</b>	<b>210,788,224</b>	<b>657,123,709</b>	<b>1,271,827,211</b>	<b>209,028,169</b>	<b>1,416,258,543</b>	<b>1,625,286,712</b>

(a) Capital charges repaid through bond debt service prior to 2013 exclude bond cover, 2014 and after includes both bond debt service and bond cover.

**TABLE B-19 Total Transportation Charge for Each Contractors <sup>a</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
	[11]	[12]	[13]	Municipal and Industrial	Agri-cultural				
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	2,725
1965	0	0	6,029	73,569	0	0	0	0	79,598
1966	0	0	12,039	137,330	0	0	0	0	149,368
1967	0	0	26,257	267,611	0	0	0	0	293,869
1968	185,112	8,934	54,588	445,439	1,546,828	13,770	11,645	209,312	2,475,627
1969	180,720	7,721	87,576	525,094	2,397,118	12,625	10,653	358,602	3,580,109
1970	202,786	14,487	94,675	573,998	2,921,006	12,790	13,192	294,869	4,127,803
1971	199,142	15,445	95,695	605,889	3,794,264	17,764	14,498	450,065	5,192,761
1972	221,782	16,313	98,788	631,615	4,971,756	15,220	20,855	1,085,490	7,061,819
1973	204,443	12,384	97,550	639,250	4,922,515	15,483	11,811	410,749	6,314,186
1974	284,828	12,353	98,460	697,026	5,235,097	15,591	12,905	600,651	6,956,910
1975	352,245	13,297	106,703	714,888	6,361,200	16,620	14,592	731,975	8,311,521
1976	306,726	13,843	108,084	773,628	6,718,011	16,993	16,278	567,200	8,520,765
1977	268,678	10,954	112,554	796,324	6,899,611	18,457	14,051	513,973	8,634,601
1978	357,652	4,441	115,521	889,236	8,349,403	18,921	18,097	507,824	10,261,095
1979	387,962	13,690	114,253	895,406	9,474,905	20,201	25,032	957,027	11,888,475
1980	409,224	12,041	125,950	888,893	10,050,618	20,749	24,467	741,417	12,273,358
1981	472,715	29,882	134,169	1,076,040	11,503,041	24,939	23,087	912,961	14,176,835
1982	467,224	13,031	135,057	997,853	12,342,798	22,955	22,559	750,557	14,752,034
1983	640,523	14,626	149,202	1,027,258	15,548,261	39,972	29,287	428,605	17,877,734
1984	913,207	15,040	164,505	2,019,472	23,725,278	54,428	59,811	787,525	27,739,267
1985	1,101,757	87,601	184,905	2,336,070	28,006,790	69,484	70,346	2,173,239	34,300,190
1986	1,265,999	34,057	180,445	2,365,158	30,563,027	80,769	76,213	2,187,878	36,753,546
1987	1,124,579	50,852	179,872	2,791,630	29,377,512	78,019	74,462	2,247,079	35,924,005
1988	1,110,191	61,647	193,735	2,720,416	29,310,738	74,169	60,345	2,204,911	35,736,152
1989	1,145,714	49,330	187,913	2,410,515	29,370,420	67,048	68,816	2,448,489	35,748,245
1990	867,245	34,490	221,392	2,512,729	27,492,154	51,057	49,248	1,875,759	33,104,074
1991	585,751	23,396	220,282	2,055,249	17,662,959	27,930	27,017	1,236,324	21,838,909
1992	955,414	39,232	241,455	2,359,679	25,971,189	55,795	51,071	1,913,464	31,587,300
1993	1,167,704	53,759	264,959	2,769,058	31,505,674	72,888	69,754	2,647,052	38,550,848
1994	1,022,794	43,885	306,359	2,799,087	29,360,802	60,460	57,521	2,122,982	35,773,889
1995	1,519,482	46,744	304,297	3,491,835	36,482,391	88,875	80,344	2,777,092	44,791,059
1996	1,348,944	48,376	389,203	3,555,587	36,461,960	86,092	73,992	4,322,982	46,287,136
1997	1,390,473	25,532	276,681	3,014,997	32,720,884	36,715	68,852	1,677,060	39,211,193
1998	1,234,357	34,487	381,847	2,654,434	29,384,348	41,835	60,148	1,807,304	35,598,759
1999	1,228,742	55,932	369,935	3,062,825	31,502,722	75,476	65,444	4,170,303	40,531,379
2000	1,057,052	37,797	302,623	2,310,152	26,314,032	61,334	54,434	2,761,650	32,899,074
2001	1,751,390	63,245	328,030	2,237,856	34,122,052	80,374	101,693	3,074,034	41,758,573
2002	1,318,880	43,679	320,646	2,328,965	28,971,421	73,314	77,932	2,551,736	35,686,574
2003	1,388,076	48,615	340,169	2,739,132	31,812,502	89,631	79,199	2,871,881	39,369,205
2004	1,443,525	77,878	342,218	3,745,402	30,406,213	233,414	81,687	2,384,189	38,714,527
2005	2,027,749	87,603	355,392	2,964,703	41,382,162	416,202	81,053	3,424,955	50,739,819
2006	1,756,346	73,642	294,884	3,234,270	37,002,913	247,793	77,636	2,746,502	45,433,985
2007	1,642,716	69,105	332,686	3,042,354	35,222,942	231,916	81,751	2,922,974	43,546,444
2008	1,491,576	61,235	469,102	3,407,726	34,356,863	243,549	79,356	3,293,928	42,503,334
2009	1,220,022	50,580	433,629	2,179,800	30,797,361	193,189	63,009	2,036,715	36,974,305
2010	1,482,985	111,092	509,790	2,372,159	36,767,043	256,410	88,801	2,713,365	44,301,643
2011	2,162,688	80,979	504,541	3,411,308	50,711,871	300,160	92,096	2,696,639	59,960,282
2012	1,257,727	89,070	469,091	3,237,959	41,042,181	318,216	93,053	3,484,686	49,991,982
2013	1,677,183	86,027	542,511	3,561,344	42,612,800	290,066	97,353	2,848,683	51,715,967
2014	1,481,346	67,762	722,260	3,426,475	43,732,583	229,861	88,807	2,231,237	51,980,329
2015	<b>1,882,518</b>	<b>100,181</b>	<b>636,343</b>	<b>5,254,634</b>	<b>47,452,408</b>	<b>344,878</b>	<b>120,418</b>	<b>3,265,355</b>	<b>59,056,736</b>
2016	1,814,659	96,816	648,512	5,082,878	46,275,699	337,592	116,499	3,141,937	57,514,591
2017	1,809,830	96,567	668,383	4,871,848	45,942,749	336,645	115,531	3,134,392	56,975,945
2018	1,735,499	92,135	651,403	4,579,428	44,954,561	313,470	105,505	3,005,255	55,437,256
2019	1,677,857	94,211	648,558	4,662,830	45,366,550	319,144	110,419	3,085,034	55,964,604
2020	1,598,102	94,811	652,431	4,668,319	45,701,776	320,735	110,557	3,102,669	56,249,401
2021	1,656,235	98,797	657,063	4,817,432	46,925,243	332,958	117,664	3,220,647	57,826,038
2022	1,634,159	97,230	662,240	4,742,810	46,590,360	328,029	114,096	3,174,061	57,342,986
2023	1,668,586	99,574	667,666	4,841,709	47,360,102	335,260	118,016	3,243,381	58,334,294
2024	1,620,851	96,230	673,057	4,685,722	46,444,968	324,863	111,585	3,144,125	57,101,400
2025	1,623,281	96,358	678,463	4,691,771	46,589,238	325,216	111,273	3,147,776	57,263,377
2026	1,633,108	96,998	684,225	4,707,555	46,809,741	327,175	112,391	3,166,587	57,537,781
2027	1,591,395	94,070	689,671	4,589,300	46,141,968	318,050	105,872	3,079,646	56,609,972
2028	1,712,081	102,382	693,387	4,937,468	48,552,449	343,740	121,518	3,325,864	59,788,889
2029	1,728,922	103,506	699,284	4,988,218	49,003,584	347,176	122,930	3,359,024	60,352,645
2030	1,605,572	94,927	705,269	4,606,088	46,611,500	320,506	106,477	3,104,559	57,154,897
2031	1,702,785	101,613	710,018	4,908,894	48,808,566	340,853	117,367	3,302,581	59,992,677
2032	1,628,867	96,454	716,407	4,639,684	47,152,468	324,880	109,014	3,149,499	57,817,274
2033	1,814,069	109,230	722,535	5,233,629	51,172,114	364,389	130,845	3,528,007	63,074,818
2034	1,675,154	99,571	728,446	4,766,138	48,266,179	334,299	113,743	3,241,552	59,225,081
2035	1,998,730	121,923	734,311	5,814,557	55,279,635	403,409	152,068	3,903,914	68,408,547
<b>TOTAL</b>	<b>82,095,632</b>	<b>4,049,696</b>	<b>26,438,900</b>	<b>201,865,604</b>	<b>2,124,592,080</b>	<b>11,632,785</b>	<b>4,978,039</b>	<b>155,089,760</b>	<b>2,610,742,494</b>

**TABLE B-19 Total Transportation Charge for Each Contractors <sup>a</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline - Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	34,411	0	0	0	726	0	0	0	51,729	0
1964	64,494	27,447	19,542	4,370	38,211	1,143	30,324	8,205	82,811	34,987
1965	121,484	53,007	34,348	7,194	42,701	2,082	53,730	15,222	135,069	35,344
1966	221,012	101,264	62,476	12,478	76,886	3,753	96,944	27,679	232,502	61,465
1967	427,622	210,814	121,269	23,472	148,839	7,284	188,141	54,023	433,350	115,574
1968	754,401	478,372	218,649	41,509	265,168	12,870	335,901	95,466	782,163	208,927
1969	1,090,136	724,768	334,105	61,226	394,024	18,693	500,020	138,063	1,205,834	321,755
1970	1,420,639	904,744	470,423	89,700	552,223	25,231	691,405	184,837	1,778,187	467,573
1971	1,760,670	1,088,715	627,331	128,360	754,065	31,837	930,568	231,280	2,538,219	659,414
1972	2,084,628	1,307,789	777,838	175,023	971,501	42,063	1,193,020	274,599	3,371,743	865,095
1973	2,177,308	1,323,930	913,614	183,270	1,174,449	43,313	1,260,210	287,315	3,919,292	946,686
1974	2,241,262	1,383,433	934,446	192,851	1,205,307	45,049	1,293,712	292,071	3,983,075	990,064
1975	2,418,045	1,451,591	980,938	205,729	1,276,653	48,373	1,362,790	304,281	4,152,070	1,088,342
1976	2,768,602	1,447,000	1,029,259	214,713	1,352,442	51,351	1,406,401	313,685	4,292,603	1,141,598
1977	2,712,256	1,516,153	929,532	225,070	1,194,916	47,299	1,479,128	329,365	4,520,755	1,197,216
1978	3,025,953	1,601,049	1,108,296	230,643	1,465,635	47,073	1,480,155	321,681	4,458,326	1,208,720
1979	3,576,175	1,635,737	1,177,452	237,530	1,564,123	48,367	1,607,400	332,472	4,422,373	1,152,375
1980	4,136,480	1,717,500	1,271,861	259,401	1,730,656	53,348	1,729,225	360,461	4,835,652	1,269,446
1981	4,469,204	1,971,239	1,355,504	271,181	1,850,802	77,806	1,854,822	391,869	5,224,182	1,357,680
1982	4,031,426	2,062,991	1,403,332	280,313	1,936,175	55,961	2,050,127	406,891	5,410,876	1,565,182
1983	5,224,176	2,325,322	1,997,502	333,081	2,880,959	69,381	2,126,296	494,688	6,020,929	1,556,652
1984	7,262,706	3,367,082	3,084,372	445,339	4,608,046	75,773	2,356,088	553,321	7,049,449	2,331,849
1985	8,979,937	3,751,564	3,882,495	540,388	5,883,195	79,232	2,467,725	759,522	7,740,359	2,378,394
1986	8,880,068	4,319,233	4,308,841	577,473	6,571,197	102,399	2,577,787	1,000,062	7,857,569	3,047,740
1987	8,897,753	4,159,956	4,164,707	604,982	6,418,840	211,808	2,611,006	1,026,398	9,224,608	3,034,142
1988	8,373,323	4,223,334	4,163,832	616,000	6,482,143	124,667	2,666,148	779,820	9,505,260	2,828,998
1989	8,750,651	4,103,287	3,808,646	586,595	5,952,263	170,571	2,614,032	1,442,627	8,944,265	2,930,396
1990	10,040,074	4,543,761	4,487,885	620,394	7,014,185	289,349	2,812,341	1,639,830	9,795,020	3,678,107
1991	6,542,000	3,512,692	2,996,131	567,450	4,550,559	175,137	3,572,283	1,294,608	8,921,839	3,035,639
1992	8,644,005	4,470,258	3,068,616	470,165	4,667,983	121,335	4,374,237	1,129,578	8,573,361	2,980,091
1993	9,028,570	4,101,673	3,267,678	472,817	4,993,632	157,747	4,253,800	1,347,511	9,505,683	3,320,012
1994	11,216,190	4,713,885	3,313,737	554,651	5,066,159	225,809	5,247,690	1,698,991	10,209,084	4,076,706
1995	10,817,875	4,971,724	4,087,603	509,163	6,340,703	155,561	4,335,917	1,527,248	9,443,228	3,715,377
1996	11,187,158	5,159,804	7,025,781	553,232	11,183,947	150,613	4,403,511	1,867,203	9,869,330	3,807,422
1997	11,437,950	4,926,525	6,588,592	579,280	7,422,989	144,833	4,707,765	1,869,307	11,268,380	4,037,862
1998	9,956,830	4,554,992	5,663,864	546,645	5,928,447	146,074	5,744,122	1,474,029	11,192,751	3,321,115
1999	11,473,042	4,978,526	4,648,108	637,393	6,003,270	146,909	5,982,328	1,853,582	12,338,933	4,177,208
2000	10,478,522	6,775,540	3,003,040	592,249	4,283,553	115,122	5,734,096	1,435,004	11,852,182	3,228,831
2001	20,726,997	12,506,077	4,120,482	799,685	6,382,599	127,868	6,460,126	3,360,265	17,902,902	3,399,314
2002	11,989,296	9,666,424	3,358,200	759,145	5,124,975	109,651	5,577,541	2,737,378	18,763,083	4,782,882
2003	13,369,255	10,725,897	3,481,778	729,898	5,327,081	115,340	7,243,479	2,277,243	17,180,168	4,953,090
2004	14,215,575	11,773,616	4,106,151	828,570	5,358,625	124,069	7,347,915	2,513,674	21,488,032	4,385,427
2005	14,615,883	10,819,710	17,771,949	653,631	10,262,610	114,208	7,147,250	2,562,018	19,541,614	4,647,075
2006	16,116,664	9,959,594	27,352,404	635,132	9,897,467	122,503	9,868,650	2,491,547	19,305,174	4,679,292
2007	19,644,375	13,382,247	26,200,530	883,318	9,390,505	126,895	13,692,812	4,033,532	25,546,781	3,845,748
2008	17,149,233	15,319,129	25,777,742	809,889	10,320,296	135,749	12,033,693	3,952,242	25,690,383	4,810,118
2009	14,811,314	12,899,681	23,217,612	780,111	8,101,156	133,512	11,599,914	3,663,806	25,308,346	5,239,379
2010	17,586,866	12,750,978	31,896,390	695,208	11,015,800	122,957	14,022,637	3,028,737	27,897,292	6,801,326
2011	23,790,149	12,326,100	33,213,282	749,019	11,912,245	136,184	7,561,975	2,974,220	25,001,930	7,453,305
2012	24,540,009	14,684,482	40,735,086	861,056	14,605,402	149,417	9,432,201	4,472,580	30,014,274	7,888,391
2013	20,235,826	17,895,992	32,106,767	1,110,958	11,362,413	174,429	9,730,945	3,637,890	30,273,924	6,190,445
2014	15,093,388	18,846,364	26,378,644	1,503,169	8,930,415	204,170	9,509,658	3,479,712	32,112,651	5,089,526
2015	27,546,233	19,984,721	38,784,159	1,615,573	14,076,031	444,690	18,901,794	4,066,969	38,786,354	7,910,570
2016	26,665,571	19,644,382	39,260,078	1,592,758	13,793,308	434,231	18,739,341	3,936,768	38,558,866	7,775,500
2017	27,046,083	19,678,109	40,306,179	1,593,592	14,078,299	442,655	18,931,803	3,997,167	38,651,020	7,866,328
2018	27,767,709	19,951,904	41,467,238	1,627,155	14,427,971	453,872	19,421,503	4,104,712	39,173,700	8,010,497
2019	25,923,648	16,453,773	40,768,348	1,555,949	13,918,318	430,639	20,355,184	3,893,303	37,970,447	7,670,137
2020	26,165,154	16,548,253	41,228,429	1,556,432	13,991,316	433,490	20,864,476	3,925,227	37,866,131	7,648,584
2021	26,100,414	16,612,604	40,897,998	1,532,708	13,869,683	431,470	20,765,937	3,912,515	37,446,617	7,545,019
2022	26,064,647	16,642,910	40,213,565	1,522,635	13,745,397	430,755	20,717,027	3,907,047	37,227,913	7,491,711
2023	26,258,444	16,938,140	39,777,960	1,531,692	13,724,687	430,856	20,869,810	3,935,943	37,320,335	7,513,368
2024	25,816,044	16,781,753	39,268,147	1,509,432	13,530,431	426,725	20,520,984	3,869,252	36,969,656	7,412,350
2025	25,955,927	17,032,356	39,448,230	1,517,139	13,605,941	429,063	20,663,340	3,890,345	37,137,279	7,453,548
2026	25,684,947	17,005,624	39,100,036	1,504,917	13,470,647	424,707	20,450,242	3,849,498	36,909,385	7,383,337
2027	26,002,478	17,230,452	39,482,891	1,521,275	13,626,901	429,945	20,702,949	3,897,355	37,232,516	7,467,335
2028	26,130,560	17,471,205	39,622,039	1,527,756	13,677,930	432,092	20,779,206	3,916,644	37,365,200	7,497,581
2029	26,431,164	17,720,834	40,018,196	1,543,097	13,832,078	437,057	21,000,268	3,962,027	37,693,309	7,582,554
2030	25,754,366	17,391,573	39,401,717	1,517,190	13,576,301	426,135	20,571,972	3,860,317	37,267,915	7,455,720
2031	27,235,286	18,186,572	40,966,294	1,582,716	14,202,115	450,266	21,613,827	4,084,047	38,460,003	7,783,852
2032	25,279,561	17,348,610	39,061,336	1,499,687	13,426,816	418,530	20,254,730	3,789,686	37,078,177	7,388,367
2033	27,592,656	18,697,116	41,437,637	1,603,858	14,374,557	456,250	21,919,596	4,139,822	38,862,506	7,881,762
2034	25,477,146	17,778,942	39,459,224	1,513,397	13,568,183	421,941	20,488,236	3,823,569	37,403,977	7,465,269
2035	29,963,714	20,062,432	43,920,284	1,706,221	15,356,759	494,925	23,532,628	4,501,522	40,730,542	8,391,383
TOTAL	1,007,473,625	658,685,439	1,230,938,645	57,125,301	544,112,375	14,405,464	651,424,849	156,010,901	1,366,281,443	306,934,073

**TABLE B-19 Total Transportation Charge for Each Contractors <sup>a</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	79,888
1963	0	690,812	0	777,678	0	0	0	0	12,626	1,628,026
1964	21,735	1,260,513	9,378	1,603,161	0	0	0	0	13,938	2,810,279
1965	21,866	2,180,589	17,766	2,720,401	0	0	405	405	28,937	4,815,355
1966	37,964	3,900,172	33,426	4,868,023	0	0	565	565	31,321	7,409,357
1967	71,283	7,693,703	68,155	9,563,529	0	0	562	562	47,718	12,845,638
1968	128,915	15,317,881	142,803	18,783,026	0	0	564	564	46,945	25,033,113
1969	198,764	23,153,064	215,209	28,355,662	0	0	3,191	3,191	52,963	36,200,650
1970	289,633	30,617,164	273,605	37,765,363	0	0	15,121	15,121	69,744	46,401,913
1971	409,327	39,958,997	342,425	49,461,209	0	0	16,001	16,001	55,532	59,058,610
1972	537,186	52,853,168	422,304	64,875,959	0	0	17,372	17,372	80,412	76,705,204
1973	587,963	57,132,802	435,655	70,385,807	0	0	17,334	17,334	54,219	81,316,664
1974	611,428	61,587,913	455,565	75,216,175	0	0	17,477	17,477	76,783	87,046,575
1975	644,621	66,557,535	478,403	80,969,370	0	0	18,406	18,406	84,547	94,208,183
1976	668,315	68,253,113	475,587	83,414,670	0	0	17,477	17,477	106,717	97,243,334
1977	696,515	66,053,753	507,063	81,409,021	0	0	18,232	18,232	98,618	95,320,795
1978	709,040	72,706,513	523,177	88,886,260	0	0	17,381	17,381	100,786	104,776,381
1979	1,122,866	72,440,511	526,405	89,433,787	0	0	20,579	20,579	119,352	107,126,393
1980	777,981	79,926,555	571,232	98,639,800	0	0	17,761	17,761	178,812	117,352,832
1981	806,031	91,261,394	636,404	111,528,117	0	0	21,193	21,193	185,347	132,147,639
1982	853,400	93,144,740	670,375	113,871,790	0	0	28,423	28,423	173,894	135,523,527
1983	952,131	101,787,700	803,591	126,572,408	0	0	19,276	19,276	220,926	152,022,990
1984	1,072,639	137,507,077	868,967	170,582,708	0	0	21,114	21,114	225,959	208,613,692
1985	1,120,854	173,442,297	908,769	211,934,259	0	0	20,239	20,239	340,322	258,859,025
1986	1,149,714	193,242,026	937,311	234,571,421	0	0	20,139	20,139	279,227	284,690,156
1987	1,172,015	178,764,439	908,034	221,198,689	0	0	19,742	19,742	345,116	272,943,798
1988	1,208,206	190,243,523	904,868	232,120,120	0	0	17,900	17,900	365,207	285,022,973
1989	1,194,911	193,235,260	932,599	234,666,103	0	0	19,158	19,158	422,329	288,101,692
1990	1,297,621	239,540,417	1,486,755	287,245,739	0	0	18,148	18,148	474,284	340,249,893
1991	1,354,921	179,950,983	1,141,118	217,615,359	0	0	21,018	21,018	214,683	255,993,289
1992	1,349,184	196,166,977	1,025,285	237,041,076	0	0	18,014	18,014	443,676	286,681,566
1993	1,507,550	169,493,328	1,068,135	212,518,137	0	0	20,999	20,999	599,571	271,477,197
1994	1,497,753	209,282,955	1,008,952	258,112,563	0	0	19,649	19,649	609,966	316,878,803
1995	1,520,622	173,420,265	1,061,324	221,906,608	0	0	20,277	20,277	534,971	290,604,264
1996	1,527,165	181,404,029	1,103,254	239,242,451	0	0	25,378	25,378	571,857	319,720,724
1997	1,730,348	186,736,526	1,216,560	242,666,917	0	0	24,820	24,820	628,638	323,978,289
1998	1,920,021	168,571,967	1,237,386	220,258,243	0	0	0	0	465,095	302,632,609
1999	2,167,221	191,636,505	1,264,332	247,307,358	0	0	0	0	584,116	339,167,423
2000	2,399,003	183,077,408	1,314,848	234,289,399	0	0	0	0	0	318,379,462
2001	3,320,640	376,219,655	1,619,721	456,946,333	0	0	0	0	0	559,317,987
2002	4,666,474	264,579,150	1,648,122	333,762,321	0	0	0	0	0	434,538,546
2003	5,926,710	292,976,972	1,668,685	365,975,695	0	0	20,768	20,768	0	466,454,377
2004	6,247,966	339,477,923	1,907,976	419,775,520	0	0	20,830	20,830	0	518,755,141
2005	6,521,637	312,278,715	1,397,164	408,333,463	0	0	20,827	20,827	0	519,387,186
2006	7,009,301	289,255,961	1,331,393	398,025,082	0	0	21,242	21,242	0	502,588,242
2007	7,650,449	374,705,197	1,875,258	500,977,192	0	0	20,891	20,891	0	608,866,326
2008	8,927,839	341,199,752	2,275,058	468,401,123	0	0	22,367	22,367	0	578,698,351
2009	9,156,163	301,594,676	2,068,705	418,574,375	0	0	18,216	18,216	0	520,660,009
2010	10,247,266	350,652,282	2,112,455	488,830,194	0	0	18,437	18,437	0	604,449,910
2011	11,019,462	391,219,132	2,095,385	529,452,388	0	0	20,124	20,124	0	665,859,992
2012	11,930,569	384,616,326	2,384,551	555,314,344	0	0	18,518	18,518	0	686,014,882
2013	12,703,606	383,547,695	2,384,477	531,355,368	0	0	17,698	17,698	0	667,670,913
2014	15,662,554	349,251,519	2,039,253	488,101,024	0	0	17,530	17,530	0	624,594,656
2015	16,565,966	438,573,276	2,408,058	629,664,395	0	0	17,147	17,147	0	781,114,493
2016	16,622,887	430,230,404	2,364,938	619,619,033	0	0	16,996	16,996	0	770,665,651
2017	16,686,999	432,020,496	2,348,562	623,647,292	0	0	16,987	16,987	0	772,759,341
2018	16,773,085	439,146,686	2,326,603	634,652,634	0	0	16,986	16,986	0	781,305,508
2019	16,572,965	417,937,357	3,309,702	606,759,772	0	0	14,361	14,361	0	753,525,274
2020	16,572,837	419,394,767	3,315,735	609,510,831	0	0	2,433	2,433	0	756,780,171
2021	16,527,555	415,730,283	3,286,795	604,659,597	0	0	1,609	1,609	0	754,216,580
2022	16,507,607	411,764,879	3,260,890	599,496,983	0	0	225	225	0	748,685,394
2023	16,530,514	413,777,505	3,288,733	601,900,986	0	0	226	226	0	752,508,722
2024	16,481,396	406,007,285	3,227,488	591,820,942	0	0	227	227	0	741,143,637
2025	16,513,231	408,578,345	3,250,115	595,474,859	0	0	227	227	0	745,161,998
2026	16,486,967	404,669,432	3,224,917	590,164,657	0	0	227	227	0	740,496,817
2027	16,554,261	408,885,790	3,255,504	596,289,653	0	0	227	227	0	745,688,986
2028	16,587,616	410,948,794	3,274,129	599,230,751	0	0	227	227	0	752,886,875
2029	16,654,977	414,840,158	3,299,179	605,014,898	0	0	226	226	0	759,618,371
2030	16,593,836	405,443,960	3,222,158	592,483,161	0	0	227	227	0	743,335,844
2031	16,807,265	422,784,670	3,340,073	617,497,167	0	0	228	228	0	772,005,195
2032	16,586,655	398,293,560	3,152,789	583,578,504	0	0	228	228	0	735,799,211
2033	16,899,843	427,377,650	3,372,403	624,615,659	0	0	230	230	0	783,498,761
2034	16,666,494	402,326,838	3,180,040	589,573,256	0	0	231	231	0	743,886,382
2035	17,239,954	455,621,274	3,573,980	665,095,619	0	0	231	231	0	830,598,541
TOTAL	505,350,259	17,690,122,938	118,088,024	24,306,953,336	0	0	881,070	881,070	8,748,370	30,364,606,469

## TABLE B-20A Calculation of Delta Water Rates

### Calculation in accordance with Article 53(i) of the Monterey Amendment

(Values in millions of dollars [\$] or millions of acre-feet [AF] discounted to 2014 at 4.610 percent per annum)

Procedure	Capital Cost Component		Minimum Operation, Maintenance, Power and Replacement Component (a)		Total Delta Water Rate	
	[ 1 ]		[ 2 ]		[ 3 ]	
<b>Commencing in 2015</b>						
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Table A Amounts during the Project Repayment Period	\$7,383.12 (b)	425.94 AF	\$6,587.94 (c)	425.94 AF	\$13,971.06	425.94 AF
Less, Project Power Revenues to be Realized During the Project Repayment Period	(3,736.41)		(3,240.36)		(\$6,976.77)	
Less, Delta Water Charges Paid and Project Water Table A Amounts, Prior to 2015	(2,648.13) (d)	(370.55) AF	(1,369.23)	(370.55) AF	(\$4,017.36)	(370.55) AF
<b>TOTAL</b>	<b>\$998.57</b>	<b>55.39 AF</b>	<b>\$1,978.36</b>	<b>55.39 AF</b>	<b>\$2,976.93</b>	<b>55.39 AF</b>
Rate Applicable in 2015	\$18.03 per acre-foot		\$35.72 per acre-foot		\$53.75 per acre-foot	

### Calculation under original provisions, without the Monterey Amendment

(for Plumas and Empire)

Procedure	Capital Cost Component		Minimum Operation, Maintenance, Power and Replacement Component (a)		Total Delta Water Rate	
	[ 4 ]		[ 5 ]		[ 6 ]	
<b>Commencing in 2015</b>						
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Table A Amounts during the Project Repayment Period	\$7,366.15 (b)	425.94 AF	\$6,556.74 (c)	425.94 AF	\$13,922.88	425.94 AF
Less, Project Power Revenues to be Realized During the Project Repayment Period	(3,736.41)		(3,240.36)		(\$6,976.77)	
Less, Delta Water Charges Paid and Project Water Table A Amounts, Prior to 2015	(2,648.13) (d)	(370.55) AF	(1,369.23)	(370.55) AF	(\$4,017.36)	(370.55) AF
<b>TOTAL</b>	<b>\$981.60</b>	<b>55.39 AF</b>	<b>\$1,947.15</b>	<b>55.39 AF</b>	<b>\$2,928.75</b>	<b>55.39 AF</b>
Rate Applicable in 2015	\$17.72 per acre-foot		\$35.16 per acre-foot		\$52.88 per acre-foot	

- (a) Considering that all operating costs of Project Conservation Facilities will not vary with annual amounts of Project water delivered, and therefore are properly classified as "Minimum" OMP&R Costs. OMP&R costs exclude amounts for Conservation RAS.
- (b) Including net credits of \$4,850,000 for settlements as to the magnitude of Project Capital costs incurred prior to December 31, 1960, and net credits of \$6,678,320 for settlement as to the magnitude of Project Capital costs incurred during the 1961 through 1978 period.
- (c) Includes conservation power costs and credits at San Luis.
- (d) Applying all Delta Water Charges paid prior to 1970 to reimburse Capital costs (the charge was not divided into components until 1970).



**TABLE B-20B Delta Water Rates by Facility**

(in dollars per acre-foot)

Item	Capital Cost Component	Minimum Operation, Maintenance, Power and Replacement Component	Total Delta Water Rate
	[1]	[2]	[3]
<b>Initial Conservation Facilities</b>			
Oroville Division			
Water Supply and power costs (a)	79.79	54.74	134.53
Less, Oroville Power Revenues	<u>-45.79</u>	<u>-24.72</u>	<u>-70.51</u>
Subtotal	34.00	30.02	64.02
Delta Facilities (b)			
California Aqueduct, portion	24.02	37.74	61.77
Reach 1	4.94	9.20	14.14
Reach 2A	2.87	1.19	4.06
Reach 2B	1.50	0.88	2.37
Reach 3	<u>1.03</u>	<u>0.50</u>	<u>1.53</u>
Subtotal	10.33	11.77	22.10
San Luis Facilities	14.67	14.13	28.80
Planning and preoperating costs through 2013	4.18	0.00	4.18
45,000 AF relinquished costs	0.31	0.56	0.87
Less, Capital Cost Credits	-2.02	0.00	-2.02
Less, Delta Water Charges paid prior to 2015	<u>-67.46</u>	<u>-58.51</u>	<u>-125.97</u>
Rate applicable in 2015	18.03	35.72	53.75

(a) Includes revenue received from non-SWP contractors.

(b) Includes 1. Delta Facility planning costs, 2. Delta Studies costs, and 3. Suisun Marsh Facilities Costs.

**TABLE B-21 Total Delta Water Charge for Each Contractor**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	14,000	50,050	177,100	241,150	0	0	0
1968	0	0	0	19,156	29,701	193,245	242,102	0	0	0
1969	0	0	0	30,324	44,096	215,483	289,903	0	0	0
1970	0	0	0	80,908	107,730	585,200	773,838	0	0	0
1971	0	0	0	57,320	123,080	637,120	817,520	0	0	0
1972	0	0	0	99,668	143,877	707,328	950,873	0	0	0
1973	0	0	0	120,880	167,099	782,167	1,070,146	0	0	0
1974	0	0	0	137,684	182,339	818,664	1,138,687	0	0	0
1975	0	0	0	146,204	187,324	804,123	1,137,651	0	0	0
1976	0	0	0	168,489	208,652	862,036	1,239,177	0	0	0
1977	0	0	0	172,931	208,645	827,062	1,208,638	0	0	0
1978	0	0	0	206,378	243,231	926,594	1,376,203	0	0	0
1979	0	0	0	237,771	273,208	1,005,955	1,516,934	0	0	0
1980	0	18,325	18,325	272,717	307,426	1,090,867	1,671,010	12,396	3,479	15,875
1981	0	25,440	25,440	415,564	469,768	1,589,984	2,475,316	18,068	10,414	28,482
1982	0	34,917	34,917	457,988	519,053	1,679,289	2,656,330	38,166	99,788	137,954
1983	0	12,035	12,035	316,703	359,775	1,114,795	1,791,273	38,004	68,902	106,906
1984	0	22,453	22,453	334,587	380,914	1,132,448	1,847,949	57,909	105,498	163,407
1985	0	22,001	22,001	381,970	435,728	1,244,939	2,062,637	106,103	192,937	299,040
1986	35,358	21,767	57,125	423,378	485,372	1,330,615	2,239,365	151,206	275,347	426,553
1987	0	22,984	22,984	430,024	493,786	1,304,900	2,228,710	185,355	336,664	522,019
1988	88,878	150,466	239,344	464,114	533,731	1,361,400	2,359,245	239,792	436,607	676,399
1989	102,688	305,328	408,016	513,853	591,760	1,491,833	2,597,446	331,518	602,402	933,920
1990	112,723	355,132	467,855	534,787	616,676	1,537,512	2,688,975	417,802	760,166	1,177,968
1991	129,296	395,515	524,811	603,028	681,067	1,667,194	2,951,289	443,403	806,745	1,250,148
1992	158,879	489,808	648,687	729,545	808,579	1,945,453	3,483,577	506,628	921,780	1,428,408
1993	172,457	530,778	703,235	771,894	840,958	1,990,673	3,603,525	507,825	923,957	1,431,782
1994	177,824	546,610	724,434	778,647	817,579	1,946,615	3,542,841	486,654	885,437	1,372,091
1995	203,738	713,497	917,235	874,946	874,946	2,083,205	3,833,097	520,801	947,567	1,468,368
1996	213,506	774,152	987,658	901,129	860,168	2,048,020	3,809,317	512,005	931,562	1,443,567
1997	250,558	866,141	1,116,699	1,041,633	951,056	2,264,420	4,257,109	566,105	1,029,994	1,596,099
1998	266,952	882,469	1,149,421	1,048,658	957,470	2,279,691	4,285,819	141,683	888,760	1,030,443
1999	290,688	923,459	1,214,147	1,084,480	990,178	2,357,566	4,432,224	589,391	1,072,362	1,661,753
2000	390,936	948,784	1,339,720	1,628,402	1,005,778	2,394,709	5,028,889	598,677	1,089,257	1,687,934
2001	496,412	1,097,880	1,594,292	1,868,283	1,005,998	2,395,234	5,269,515	598,809	1,089,496	1,688,305
2002	512,928	1,125,429	1,638,357	1,896,134	1,020,996	2,430,942	5,348,072	607,736	1,105,738	1,713,474
2003	511,059	1,112,692	1,623,751	1,856,232	999,510	2,379,785	5,235,527	594,946	1,082,469	1,677,415
2004	569,615	1,230,627	1,800,242	2,033,406	1,094,911	2,606,931	5,735,248	651,732	1,185,788	1,837,520
2005	573,729	1,219,893	1,793,622	2,081,144	1,084,212	2,581,456	5,746,812	645,364	1,174,201	1,819,565
2006	606,343	1,272,001	1,878,344	2,167,748	1,129,330	2,688,880	5,985,958	672,220	1,223,064	1,895,284
2007	623,728	1,291,247	1,914,975	2,198,222	1,145,206	2,726,679	6,070,107	681,671	1,240,257	1,921,928
2008	647,091	1,322,240	1,969,331	2,248,610	1,171,457	2,789,182	6,209,249	697,295	1,268,688	1,965,983
2009	717,087	1,446,549	2,163,636	2,457,420	1,280,240	3,048,190	6,785,850	762,047	1,386,499	2,148,546
2010	1,105,529	1,809,450	2,914,979	3,070,686	1,599,732	3,808,886	8,479,304	952,222	1,732,510	2,684,732
2011	1,216,921	1,993,865	3,210,786	3,380,086	1,760,920	4,192,667	9,333,673	1,048,166	1,907,076	2,955,242
2012	1,270,523	2,083,876	3,354,399	3,528,968	1,838,483	4,377,339	9,744,790	1,094,335	1,991,077	3,085,412
2013	1,344,704	2,207,862	3,552,566	3,735,010	1,945,825	4,632,915	10,313,750	1,158,229	2,107,328	3,265,557
2014	1,276,099	2,097,420	3,373,519	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
<b>2015</b>	<b>1,560,082</b>	<b>2,566,866</b>	<b>4,126,948</b>	<b>4,333,239</b>	<b>2,257,484</b>	<b>5,374,960</b>	<b>11,965,683</b>	<b>1,343,740</b>	<b>2,444,855</b>	<b>3,788,595</b>
2016	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2017	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2018	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2019	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2020	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2021	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2022	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2023	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2024	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2025	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2026	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2027	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2028	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2029	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2030	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2031	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2032	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2033	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2034	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
2035	1,560,082	2,566,866	4,126,948	4,333,239	2,257,484	5,374,960	11,965,683	1,343,740	2,444,855	3,788,595
<b>TOTAL</b>	<b>46,827,971</b>	<b>83,277,278</b>	<b>130,105,249</b>	<b>142,564,185</b>	<b>82,281,336</b>	<b>202,328,003</b>	<b>427,173,524</b>	<b>45,951,941</b>	<b>84,225,586</b>	<b>130,177,527</b>

**TABLE B-21 Total Delta Water Charge for Each Contractor**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
	[11]	[12]	[13]	Municipal and Industrial	Agricultural	[16]	[17]	[18]	[19]
1964	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0
1968	40,695	10,469	0	0	165,522	3,177	8,073	98,608	326,544
1969	61,267	3,281	0	0	337,686	4,200	8,805	102,478	517,717
1970	104,405	19,950	0	0	964,915	8,645	17,290	228,095	1,343,300
1971	129,596	21,720	0	0	1,377,772	9,412	20,272	264,260	1,823,032
1972	160,756	24,113	0	0	2,175,835	11,253	43,131	905,057	3,320,145
1973	195,541	26,664	0	386,638	2,373,167	13,333	27,553	373,307	3,396,203
1974	224,202	27,909	0	446,545	2,781,595	13,954	29,770	445,138	3,969,113
1975	329,688	27,413	0	481,560	3,041,048	14,620	33,702	827,591	4,755,622
1976	414,245	29,388	0	549,549	3,931,785	15,673	35,966	877,151	5,853,757
1977	312,532	28,195	0	569,545	4,071,218	15,977	40,289	626,210	5,663,966
1978	342,208	31,588	0	674,939	4,950,959	20,006	41,065	666,516	6,727,281
1979	395,523	34,294	0	772,757	5,901,986	22,863	45,725	771,613	7,944,761
1980	555,341	37,679	0	881,371	6,984,026	27,272	70,658	933,481	9,489,828
1981	740,789	54,204	0	1,351,487	11,140,730	41,556	77,692	1,373,168	14,779,626
1982	782,396	57,248	0	1,518,993	12,703,436	47,707	85,873	1,530,443	16,726,096
1983	543,462	38,004	0	1,057,789	9,141,315	35,471	58,273	78,506	10,952,820
1984	580,379	13,572	0	1,333,200	9,741,623	39,893	61,770	756,132	12,526,569
1985	667,740	42,441	0	1,540,611	11,403,920	48,100	69,320	644,383	14,416,515
1986	745,447	45,362	0	1,714,679	12,925,113	55,946	77,115	1,469,725	17,033,387
1987	762,180	44,485	0	1,766,065	13,410,817	59,314	77,108	1,503,601	17,623,570
1988	827,669	46,411	0	1,916,790	14,707,763	61,882	83,540	1,633,680	19,277,735
1989	921,621	49,728	0	2,125,033	16,312,361	66,304	92,825	1,821,693	21,389,565
1990	964,288	50,136	0	1,998,766	17,276,959	66,848	95,259	1,980,383	22,432,639
1991	1,023,374	53,208	0	2,121,239	18,335,590	70,944	101,096	2,101,729	23,807,180
1992	1,169,299	60,795	0	2,727,688	20,646,125	81,061	115,511	2,401,419	27,201,898
1993	1,172,060	60,939	0	2,734,129	20,694,874	81,252	115,784	2,407,089	27,266,127
1994	1,123,198	58,398	0	2,156,809	20,295,455	77,865	110,957	2,306,739	26,129,421
1995	1,202,009	62,497	0	2,803,995	21,223,694	83,328	118,743	2,468,598	27,962,864
1996	534,818	69,191	0	2,756,635	19,492,814	81,921	102,219	2,426,904	25,464,502
1997	1,208,521	67,162	0	3,047,908	22,148,973	90,576	129,072	2,683,338	29,375,550
1998	1,216,671	77,807	0	2,726,511	22,070,376	91,188	129,942	2,820,148	29,132,643
1999	1,258,233	69,974	0	2,819,648	22,824,299	94,303	134,381	2,793,715	29,994,553
2000	1,278,056	70,943	0	3,223,279	21,220,235	95,788	136,498	2,837,730	28,862,529
2001	1,278,336	71,058	0	2,864,700	21,110,372	95,809	136,528	2,838,352	28,395,155
2002	1,393,975	72,121	0	3,272,056	21,060,431	97,237	138,564	2,711,156	28,745,540
2003	1,364,640	70,550	0	3,203,191	20,617,243	95,192	135,648	2,654,103	28,140,567
2004	1,494,892	77,810	0	3,508,929	22,585,122	104,277	148,595	2,897,005	30,816,300
2005	1,480,284	77,153	0	3,474,640	22,307,136	232,331	147,143	2,739,621	30,458,308
2006	1,541,884	80,380	0	3,619,232	23,235,418	242,000	153,266	2,587,428	31,459,608
2007	1,563,559	81,479	0	3,670,110	23,562,051	253,717	155,421	2,615,486	31,901,823
2008	1,599,401	83,191	0	3,754,239	24,102,160	259,533	158,984	2,675,439	32,632,947
2009	1,747,923	90,846	0	4,102,863	26,340,321	283,634	173,747	2,923,885	35,663,219
2010	1,917,507	113,466	0	5,126,760	32,304,300	354,417	217,107	3,386,937	43,420,494
2011	2,110,714	123,965	0	5,643,329	35,559,263	390,127	238,982	3,728,203	47,794,583
2012	2,203,684	129,358	0	5,891,899	37,125,531	407,312	249,508	3,892,417	49,899,709
2013	2,332,348	136,898	0	6,235,904	39,283,142	431,093	264,076	4,119,681	52,813,142
2014	2,125,733	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,967,023
<b>2015</b>	<b>2,437,545</b>	<b>158,639</b>	<b>0</b>	<b>7,234,697</b>	<b>45,586,650</b>	<b>500,140</b>	<b>306,372</b>	<b>4,701,532</b>	<b>60,925,575</b>
2016	2,437,545	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,925,575
2017	2,437,545	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,925,575
2018	2,437,545	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,925,575
2019	2,437,545	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,925,575
2020	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2021	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2022	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2023	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2024	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2025	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2026	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2027	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2028	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2029	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2030	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2031	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2032	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2033	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2034	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
2035	2,222,546	158,639	0	7,234,697	45,586,650	500,140	306,372	4,701,532	60,710,576
<b>TOTAL</b>	<b>93,891,550</b>	<b>6,084,501</b>	<b>0</b>	<b>260,418,407</b>	<b>1,720,584,607</b>	<b>15,710,350</b>	<b>11,397,261</b>	<b>187,506,221</b>	<b>2,295,592,897</b>

**TABLE B-21 Total Delta Water Charge for Each Contractor**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline-Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	0
1968	0	13,060	0	0	0	0	0	0	0	0
1969	0	17,804	0	0	0	0	0	0	0	0
1970	0	37,905	0	0	0	0	0	0	0	0
1971	0	48,508	0	0	0	0	0	0	0	0
1972	160,756	74,751	41,797	4,662	64,303	1,367	67,518	13,021	369,739	85,202
1973	222,207	107,163	51,552	7,279	79,994	2,577	95,104	26,131	54,908	14,338
1974	279,090	143,266	59,539	10,791	93,030	3,721	121,869	39,631	465,150	114,427
1975	319,822	166,307	63,964	13,250	100,515	4,752	140,722	50,989	479,733	119,705
1976	431,018	207,673	74,449	17,045	117,550	6,269	174,366	67,591	538,772	137,142
1977	469,922	226,502	79,144	19,079	122,180	6,861	189,848	77,255	540,410	139,097
1978	600,180	274,819	97,313	24,428	147,413	9,687	236,913	98,345	631,768	165,313
1979	720,173	320,077	115,033	29,836	171,470	11,889	284,640	117,285	714,457	189,760
1980	857,818	376,845	134,920	35,949	210,736	14,256	337,177	138,590	811,952	215,694
1981	1,355,100	592,631	218,713	57,637	343,292	22,946	534,813	211,396	1,237,658	330,644
1982	1,551,434	664,082	254,298	66,408	400,739	26,335	313,057	235,100	1,341,923	364,482
1983	1,110,994	472,521	184,283	47,759	291,367	19,002	434,517	163,925	943,775	252,096
1984	450,405	509,602	202,914	52,247	321,718	20,719	472,282	174,500	1,003,760	266,383
1985	565,881	591,346	240,344	61,540	381,970	24,474	551,734	200,605	1,152,983	308,405
1986	635,066	659,259	275,347	70,160	438,498	27,822	625,994	223,785	1,285,253	350,799
1987	652,450	676,176	288,131	73,104	467,095	29,064	648,002	228,654	1,319,729	364,779
1988	711,641	742,582	319,496	80,756	525,996	32,024	711,641	248,146	1,438,752	402,232
1989	2,083,593	830,453	362,565	91,333	605,021	36,301	803,932	276,155	1,607,864	454,180
1990	2,207,667	869,029	386,049	96,930	636,731	38,438	848,974	289,119	1,696,277	481,308
1991	2,454,678	961,298	409,704	102,869	675,746	40,793	900,994	306,835	1,819,725	510,800
1992	2,804,695	1,098,371	468,125	117,538	772,102	46,610	1,029,469	350,587	2,079,203	583,636
1993	2,811,318	1,100,964	469,230	117,815	773,925	46,720	1,031,900	351,415	2,084,113	585,014
1994	2,694,116	1,055,065	449,668	112,905	741,661	44,772	988,880	336,766	1,997,227	560,625
1995	2,883,156	1,129,097	481,220	120,826	793,702	47,914	1,058,269	360,394	2,137,369	599,963
1996	2,834,460	1,110,027	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830
1997	3,133,957	1,227,316	523,081	131,336	862,744	52,082	1,150,325	391,745	2,323,295	652,153
1998	3,155,093	1,235,593	526,609	132,222	868,562	52,433	1,128,006	394,387	2,338,963	656,551
1999	3,262,870	1,277,800	544,598	136,739	898,233	54,224	1,187,034	407,859	2,418,863	678,979
2000	3,314,278	2,279,763	553,178	138,893	912,384	55,078	1,815,190	510,073	2,456,972	689,676
2001	3,315,004	2,280,263	553,299	138,924	912,584	55,090	1,815,587	510,185	2,457,510	689,827
2002	3,437,351	2,314,256	561,548	140,995	926,188	55,912	1,842,654	517,791	2,494,146	700,112
2003	3,365,016	2,265,555	549,731	138,028	906,698	54,735	1,803,877	506,894	2,441,659	685,379
2004	3,686,201	2,481,798	602,201	151,202	993,241	59,960	1,976,053	555,277	2,674,711	750,797
2005	3,650,179	2,457,547	596,316	149,725	983,535	59,374	1,956,744	549,850	2,648,574	743,459
2006	3,802,076	2,559,814	3,256,234	155,955	1,344,440	61,844	2,038,171	572,732	2,758,791	774,397
2007	3,855,524	2,595,798	3,302,008	158,148	1,363,339	62,714	2,066,822	580,783	2,797,573	785,284
2008	3,943,904	2,655,301	3,377,700	161,772	1,394,591	64,151	2,114,200	594,096	2,861,701	803,284
2009	4,310,140	2,901,877	3,691,358	176,795	1,524,095	70,109	2,310,528	649,264	3,127,443	877,878
2010	5,385,764	3,626,059	5,269,593	220,916	2,123,453	87,605	3,153,757	811,293	3,907,916	1,096,959
2011	5,928,431	3,991,418	5,800,554	243,174	2,337,412	96,432	3,471,528	893,038	4,301,676	1,207,488
2012	6,189,558	4,167,227	6,056,050	253,886	2,440,367	100,679	3,624,437	932,373	4,491,150	1,260,674
2013	6,550,942	4,410,535	6,409,638	268,709	2,582,850	106,557	3,836,054	986,811	4,753,371	1,334,279
2014	6,368,143	4,185,518	6,082,630	255,000	2,451,078	101,120	3,640,346	936,466	4,510,863	1,266,208
<b>2015</b>	<b>7,785,307</b>	<b>5,116,962</b>	<b>7,436,258</b>	<b>311,747</b>	<b>2,996,541</b>	<b>123,624</b>	<b>4,611,715</b>	<b>1,144,866</b>	<b>5,514,710</b>	<b>1,547,989</b>
2016	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,611,715	1,144,866	5,514,710	1,547,989
2017	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,611,715	1,144,866	5,514,710	1,547,989
2018	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,611,715	1,144,866	5,514,710	1,547,989
2019	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,611,715	1,144,866	5,514,710	1,547,989
2020	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2021	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2022	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2023	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2024	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2025	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2026	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2027	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2028	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2029	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2030	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2031	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2032	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2033	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2034	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
2035	7,785,307	5,116,962	7,436,258	311,747	2,996,541	123,624	4,826,715	1,144,866	5,514,710	1,547,989
<b>TOTAL</b>	<b>272,013,518</b>	<b>171,446,823</b>	<b>210,618,635</b>	<b>11,250,037</b>	<b>98,810,205</b>	<b>4,458,620</b>	<b>156,060,337</b>	<b>40,283,630</b>	<b>201,427,856</b>	<b>56,347,007</b>

**TABLE B-21 Total Delta Water Charge for Each Contractor**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1964	0	0	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0	0	241,150
1968	0	0	0	13,060	0	1,050	875	1,925	0	583,631
1969	0	0	0	17,804	0	1,225	929	2,154	0	827,578
1970	0	0	0	37,905	0	3,848	1,995	5,843	0	2,160,886
1971	0	0	0	48,508	0	4,546	3,186	7,732	0	2,696,792
1972	0	2,043,211	0	2,926,327	0	4,929	3,778	8,707	0	7,206,052
1973	0	2,317,893	0	2,979,146	0	7,059	4,444	11,503	0	7,456,998
1974	0	4,231,933	0	5,562,447	0	8,336	4,931	13,267	0	10,683,514
1975	0	5,073,286	0	6,533,045	0	9,416	5,117	14,533	0	12,440,851
1976	0	6,422,167	0	8,194,042	0	7,004	5,780	12,784	0	15,299,760
1977	0	7,104,278	0	8,974,576	0	16,917	5,827	22,744	0	15,869,924
1978	0	9,016,389	0	11,302,568	0	12,635	6,844	19,479	0	19,425,531
1979	0	10,935,192	0	13,609,812	0	16,575	7,773	24,348	0	23,095,855
1980	84,294	13,102,796	12,396	16,333,423	0	19,834	8,801	28,635	0	27,557,096
1981	140,930	20,910,099	36,136	25,991,995	0	21,682	13,370	35,052	0	43,335,911
1982	167,929	23,998,560	57,248	29,441,595	0	16,117	14,694	30,811	0	49,027,703
1983	124,148	17,203,307	50,672	21,298,366	0	15,202	10,134	25,336	0	34,186,736
1984	138,982	18,766,458	64,344	22,444,314	20,590	15,442	10,681	46,713	0	37,051,405
1985	166,935	22,050,974	84,882	26,382,073	24,050	16,976	12,166	53,192	0	43,235,458
1986	195,056	25,089,658	120,965	29,997,662	31,753	18,145	13,457	63,355	0	49,817,447
1987	207,598	26,095,043	148,284	31,198,109	37,071	17,794	13,642	68,507	0	51,663,899
1988	233,604	28,781,238	201,116	34,429,224	46,722	18,565	14,852	80,139	0	57,062,086
1989	268,530	32,505,376	265,215	40,190,518	61,184	19,891	16,576	97,651	0	65,617,116
1990	289,119	33,616,369	334,242	41,790,252	63,506	20,055	17,381	100,942	0	68,658,631
1991	306,835	35,676,185	354,722	44,521,184	170,267	21,283	19,155	210,705	0	73,265,317
1992	350,587	40,763,329	405,303	50,869,555	194,545	24,318	22,697	241,560	0	83,873,685
1993	351,415	40,859,579	406,260	50,989,668	195,005	24,376	23,563	242,944	0	84,237,281
1994	336,766	39,156,173	389,323	48,863,947	186,875	23,360	23,360	233,595	0	80,866,329
1995	360,394	41,903,674	416,641	52,292,619	199,987	24,999	26,040	251,026	0	86,725,209
1996	0	41,195,923	409,604	51,055,092	196,610	24,576	26,624	247,810	0	83,007,946
1997	0	45,548,810	447,746	56,444,590	214,918	27,173	30,223	272,314	0	93,062,361
1998	0	45,855,992	450,529	57,394,940	107,459	27,356	31,537	166,352	0	93,159,618
1999	47,152	47,422,430	466,491	59,403,272	226,327	28,291	33,820	288,438	0	96,994,387
2000	71,841	48,169,576	478,942	61,445,844	229,892	69,207	35,708	334,807	0	98,699,723
2001	95,809	48,180,135	479,047	61,483,264	229,942	83,833	37,187	350,962	0	98,781,493
2002	97,237	48,898,394	486,188	62,472,772	233,371	85,083	39,185	357,639	0	100,275,854
2003	118,989	47,869,376	475,957	61,181,894	228,460	83,293	39,743	351,496	0	98,210,650
2004	156,416	52,438,419	521,386	67,047,662	250,266	92,048	0	342,314	0	107,579,616
2005	167,795	51,925,988	516,291	66,405,377	247,820	717,290	0	965,110	0	107,188,794
2006	188,222	51,397,939	537,776	69,448,391	258,133	32,606	8,699	299,438	0	110,967,023
2007	204,501	52,120,469	545,336	70,438,299	268,738	33,950	19,600	322,288	0	112,569,420
2008	482,528	53,315,217	557,837	72,326,282	274,736	794,785	56,138	1,125,659	0	116,229,451
2009	527,337	58,266,144	609,638	79,042,606	292,626	844,842	63,417	1,200,885	0	127,004,742
2010	658,937	72,806,845	761,778	99,910,875	365,653	1,054,033	81,825	1,501,511	0	158,911,895
2011	725,331	80,142,822	838,533	109,977,837	414,001	1,185,940	92,561	1,692,502	0	174,964,623
2012	757,280	83,672,846	875,468	114,821,995	424,826	1,216,951	100,037	1,741,814	0	182,648,119
2013	801,494	88,558,170	926,583	121,525,993	444,760	1,274,052	109,975	1,828,787	0	193,299,795
2014	760,603	84,040,101	879,310	115,477,386	431,273	1,235,416	108,033	1,774,722	0	183,479,164
<b>2015</b>	<b>929,868</b>	<b>102,742,365</b>	<b>1,074,992</b>	<b>141,336,944</b>	<b>515,997</b>	<b>1,478,114</b>	<b>137,487</b>	<b>2,131,598</b>	<b>0</b>	<b>224,275,343</b>
2016	929,868	102,742,365	1,074,992	141,336,944	515,997	1,478,114	142,775	2,136,886	0	224,280,631
2017	929,868	102,742,365	1,074,992	141,336,944	515,997	1,478,114	142,775	2,136,886	0	224,280,631
2018	929,868	102,742,365	1,074,992	141,336,944	515,997	1,478,114	142,775	2,136,886	0	224,280,631
2019	929,868	102,742,365	1,074,992	141,336,944	515,997	1,478,114	142,775	2,136,886	0	224,280,631
2020	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2021	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2022	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2023	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2024	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2025	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2026	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2027	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2028	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2029	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2030	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2031	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2032	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2033	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2034	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
2035	929,868	102,742,365	1,074,992	141,551,944	515,997	1,478,114	142,775	2,136,886	0	224,280,632
<b>TOTAL</b>	<b>29,111,822</b>	<b>3,767,038,428</b>	<b>37,187,021</b>	<b>5,056,053,939</b>	<b>17,407,303</b>	<b>40,362,698</b>	<b>4,219,347</b>	<b>61,989,348</b>	<b>0</b>	<b>8,101,092,484</b>

**TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County	Santa Barbara County	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	29,131	40,505	69,636	25,436	30,176	100,035	155,647	13,126	24,392	37,518
1989	48,804	69,621	118,425	43,343	51,681	170,303	265,327	26,828	49,634	76,462
1990	41,166	60,482	101,648	38,407	51,185	149,440	239,032	27,956	51,795	79,751
1991	63,389	92,401	155,790	62,470	81,991	235,712	380,173	44,887	83,709	128,596
1992	84,320	126,227	210,547	89,247	115,208	325,629	530,084	61,137	113,925	175,062
1993	90,152	137,473	227,625	98,432	125,174	347,457	571,063	67,725	126,662	194,387
1994	91,785	141,222	233,007	102,021	126,216	352,415	580,652	81,420	159,156	240,576
1995	108,311	181,787	290,098	126,001	149,377	416,956	692,334	131,675	270,726	402,401
1996	132,305	232,343	364,648	158,514	180,787	505,042	844,343	242,654	534,449	777,103
1997	135,556	237,492	373,048	171,263	187,162	522,127	880,552	141,810	846,617	988,427
1998	130,346	228,366	358,712	164,682	179,971	502,065	846,718	136,361	814,087	950,448
1999	182,507	316,416	498,923	227,072	248,031	691,830	1,166,933	188,835	1,124,110	1,312,945
2000	238,571	364,418	602,989	260,766	284,875	794,730	1,340,371	218,359	1,364,019	1,582,378
2001	234,773	358,616	593,389	561,965	280,341	782,078	1,624,384	214,883	1,342,304	1,557,187
2002	257,520	391,851	649,371	610,230	288,977	806,174	1,705,381	221,503	1,383,661	1,605,164
2003	268,151	408,027	676,178	635,422	300,907	839,455	1,775,784	230,647	1,440,782	1,671,429
2004	268,425	408,444	676,869	636,070	301,214	840,312	1,777,596	230,883	1,442,252	1,673,135
2005	253,413	385,602	639,015	610,756	284,369	793,318	1,688,443	217,970	1,361,594	1,579,564
2006	274,219	417,261	691,480	660,900	307,716	858,451	1,827,067	235,866	1,473,385	1,709,251
2007	177,891	270,066	447,957	441,730	197,505	550,975	1,190,210	152,478	975,872	1,128,350
2008	254,590	386,862	641,452	773,686	288,283	803,089	1,865,058	223,659	1,369,892	1,593,551
2009	285,324	434,158	719,482	687,665	320,178	893,215	1,901,058	245,418	1,533,052	1,778,470
2010	273,015	415,428	688,443	657,998	306,365	854,681	1,819,044	234,831	1,466,914	1,701,745
2011	294,866	448,677	743,543	710,662	330,884	923,085	1,964,631	253,625	1,584,318	1,837,943
2012	383,092	455,983	839,075	753,264	330,355	933,048	2,016,667	229,311	1,456,050	1,685,361
2013	416,223	495,679	911,902	820,192	360,039	1,013,496	2,193,727	249,613	1,583,700	1,833,313
2014	753,983	898,450	1,652,433	1,483,870	650,495	1,831,167	3,965,532	450,891	2,858,402	3,309,293
2015	937,429	1,118,566	2,055,995	1,837,490	808,146	2,269,691	4,915,327	560,305	3,533,322	4,093,627
2016	944,305	1,126,771	2,071,076	1,850,968	814,074	2,286,340	4,951,382	564,415	3,559,240	4,123,655
2017	933,293	1,113,631	2,046,924	1,829,383	804,580	2,259,677	4,893,640	557,833	3,517,732	4,075,565
2018	847,063	1,010,739	1,857,802	1,660,361	730,243	2,050,899	4,441,503	506,293	3,192,719	3,699,012
2019	890,849	1,062,985	1,953,834	1,746,186	767,990	2,156,911	4,671,087	532,464	3,357,753	3,890,217
2020	843,192	1,006,120	1,849,312	1,652,773	726,906	2,041,526	4,421,205	503,979	3,178,128	3,682,107
2021	841,154	1,003,688	1,844,842	1,648,778	725,149	2,036,591	4,410,518	502,761	3,170,446	3,673,207
2022	812,280	969,235	1,781,515	1,592,181	700,257	1,966,682	4,259,120	485,503	3,061,616	3,547,119
2023	819,151	977,433	1,796,584	1,605,648	706,180	1,983,317	4,295,145	489,610	3,087,512	3,577,122
2024	797,643	951,770	1,749,413	1,563,491	687,638	1,931,243	4,182,372	476,754	3,006,447	3,483,201
2025	737,377	879,859	1,617,236	1,445,361	635,684	1,785,328	3,866,373	440,733	2,779,294	3,220,027
2026	695,319	829,674	1,524,993	1,362,921	599,426	1,683,498	3,645,845	415,595	2,620,771	3,036,366
2027	750,256	895,226	1,645,482	1,470,605	646,786	1,816,510	3,933,901	448,431	2,827,836	3,276,267
2028	608,832	726,475	1,335,307	1,193,394	524,866	1,474,095	3,192,355	363,901	2,294,785	2,658,686
2029	651,139	776,956	1,428,095	1,276,321	561,339	1,576,528	3,414,188	389,188	2,454,247	2,843,435
2030	127,621	152,281	279,902	250,154	110,020	308,994	669,168	76,279	481,024	557,303
2031	127,669	152,338	280,007	250,249	110,062	309,111	669,422	76,308	481,206	557,514
2032	127,683	152,355	280,038	250,276	110,074	309,144	669,494	76,317	481,258	557,575
2033	127,725	152,405	280,130	250,359	110,110	309,246	669,715	76,342	481,416	557,758
2034	127,651	152,317	279,968	250,214	110,047	309,068	669,329	76,298	481,139	557,437
2035	127,670	152,340	280,010	250,251	110,063	309,113	669,427	76,309	481,209	557,518
<b>TOTAL</b>	<b>18,647,129</b>	<b>23,767,021</b>	<b>42,414,150</b>	<b>36,849,428</b>	<b>17,459,102</b>	<b>49,009,797</b>	<b>103,318,327</b>	<b>12,469,969</b>	<b>75,364,559</b>	<b>87,834,528</b>

(a) 1988 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include bond cover.



**TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	Total
				Municipal and Industrial	Agri-cultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1971	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0
1988	33,986	1,657	0	67,288	726,501	2,228	2,851	66,748	901,259
1989	59,273	2,785	0	116,689	1,251,452	3,733	4,927	116,736	1,555,595
1990	53,349	2,419	0	287,811	947,351	3,248	4,367	109,118	1,407,663
1991	82,252	3,731	0	359,380	1,564,983	5,035	6,771	168,217	2,190,369
1992	112,566	5,127	0	452,691	2,153,423	6,927	9,285	230,217	2,970,236
1993	119,670	5,459	0	272,449	2,491,672	7,381	9,894	244,813	3,151,338
1994	118,265	5,379	0	244,671	2,485,820	7,300	9,766	241,933	3,113,134
1995	139,226	6,340	0	317,885	2,894,181	8,599	11,490	284,798	3,662,519
1996	169,333	7,703	0	354,341	2,722,240	10,461	13,978	346,367	3,624,423
1997	165,364	7,980	0	366,285	2,673,847	10,826	14,465	357,986	3,596,753
1998	159,011	7,672	0	352,211	2,571,110	10,410	13,909	344,232	3,458,555
1999	218,784	10,373	0	485,897	3,371,115	14,376	19,166	476,017	4,595,728
2000	251,339	11,735	0	557,296	3,620,348	16,500	21,990	546,406	5,025,614
2001	247,338	11,547	0	548,424	3,461,158	16,238	21,640	537,707	4,844,052
2002	273,542	11,904	0	565,321	3,496,023	16,737	22,306	521,659	4,907,492
2003	284,834	12,395	0	588,659	3,640,346	17,428	23,227	543,193	5,110,082
2004	285,125	12,408	0	589,259	3,644,059	17,446	23,251	543,748	5,115,296
2005	269,179	11,714	0	556,305	3,431,851	39,485	21,951	488,483	4,818,968
2006	291,279	12,676	0	601,979	3,713,614	42,726	23,753	528,589	5,214,616
2007	187,144	8,113	0	383,463	2,314,841	34,088	15,230	285,915	3,228,794
2008	271,383	11,832	0	563,171	3,478,837	41,080	22,094	445,805	4,834,202
2009	303,076	13,189	0	626,357	3,864,004	46,037	24,715	497,108	5,374,486
2010	257,209	12,620	0	599,335	3,631,924	44,051	23,648	440,950	5,009,737
2011	277,794	13,630	0	647,304	3,922,606	47,577	25,542	476,242	5,410,695
2012	271,192	12,709	0	666,489	5,450,478	40,125	23,964	510,822	6,975,779
2013	286,050	13,814	0	724,170	5,680,875	43,592	26,041	521,112	7,295,654
2014	502,213	24,980	0	1,311,071	10,269,483	78,931	47,126	931,305	13,165,109
<b>2015</b>	<b>599,890</b>	<b>31,255</b>	<b>0</b>	<b>1,634,487</b>	<b>12,823,108</b>	<b>98,626</b>	<b>58,931</b>	<b>1,163,909</b>	<b>16,410,206</b>
2016	604,290	31,484	0	1,646,476	12,917,168	99,349	59,363	1,172,447	16,530,577
2017	597,243	31,117	0	1,627,275	12,766,530	98,191	58,671	1,158,774	16,337,801
2018	542,062	28,242	0	1,476,927	11,586,995	89,119	53,250	1,051,711	14,828,306
2019	570,082	29,702	0	1,553,270	12,185,935	93,725	56,003	1,106,075	15,594,792
2020	539,585	28,113	0	1,470,177	11,534,040	88,711	53,007	1,046,905	14,760,538
2021	538,281	28,045	0	1,466,623	11,506,161	88,497	52,879	1,044,374	14,724,860
2022	519,803	27,082	0	1,416,280	11,111,196	85,459	51,064	1,008,525	14,219,409
2023	524,200	27,311	0	1,428,259	11,205,177	86,182	51,495	1,017,055	14,339,679
2024	510,437	26,594	0	1,390,759	10,910,975	83,919	50,143	990,351	13,963,178
2025	471,871	24,585	0	1,285,680	10,086,596	77,579	46,355	915,525	12,908,191
2026	444,956	23,183	0	1,212,348	9,511,283	73,154	43,711	863,306	12,171,941
2027	480,112	25,014	0	1,308,135	10,262,763	78,934	47,164	931,515	13,133,637
2028	389,610	20,299	0	1,061,550	8,328,218	64,055	38,274	755,923	10,657,929
2029	416,684	21,710	0	1,135,315	8,906,937	68,506	40,933	808,452	11,398,537
2030	81,669	4,255	0	222,518	1,745,728	13,427	8,023	158,454	2,234,074
2031	81,699	4,257	0	222,602	1,746,389	13,432	8,026	158,514	2,234,919
2032	81,708	4,257	0	222,626	1,746,577	13,433	8,027	158,531	2,235,159
2033	81,735	4,259	0	222,699	1,747,153	13,438	8,029	158,583	2,235,896
2034	81,688	4,256	0	222,571	1,746,145	13,430	8,025	158,492	2,234,607
2035	81,700	4,257	0	222,604	1,746,402	13,432	8,026	158,515	2,234,936
<b>TOTAL</b>	<b>13,929,081</b>	<b>691,168</b>	<b>0</b>	<b>35,655,382</b>	<b>265,595,618</b>	<b>1,987,163</b>	<b>1,296,746</b>	<b>26,792,162</b>	<b>345,947,320</b>

(a) 1988 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include bond cover.

**TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley-East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	64,266	57,111	27,032	7,656	44,492	2,154	55,996	16,240	151,182	39,907
1989	205,668	98,720	46,993	13,263	78,104	3,763	97,138	27,981	259,860	69,104
1990	185,010	87,808	42,449	11,905	69,970	3,385	87,327	24,956	231,650	61,851
1991	296,854	140,371	65,947	18,548	108,704	5,236	135,623	38,641	363,310	96,172
1992	402,015	234,421	89,358	25,192	147,297	7,053	183,813	52,160	491,537	130,372
1993	424,871	247,076	93,981	26,566	154,919	7,437	193,361	55,045	517,379	137,298
1994	424,023	247,222	94,502	26,865	155,776	7,431	194,191	54,968	525,394	139,422
1995	500,084	290,998	111,730	31,822	184,170	8,769	229,530	64,852	623,848	165,593
1996	606,388	353,132	135,428	38,634	223,237	10,640	278,178	78,696	760,333	201,821
1997	626,151	362,776	139,565	39,802	230,058	10,972	286,779	81,146	808,482	207,472
1998	602,091	348,838	134,202	38,273	221,218	10,550	275,761	78,028	777,418	199,501
1999	826,108	479,470	184,524	52,650	304,166	14,475	642,815	107,060	1,041,566	277,200
2000	940,325	1,150,965	210,453	60,212	346,906	16,486	736,157	121,898	1,191,538	316,860
2001	925,355	1,132,642	207,102	59,254	341,384	16,224	724,438	135,581	1,172,568	311,816
2002	974,814	1,167,539	213,483	61,079	351,902	16,724	746,758	139,071	1,208,696	321,423
2003	1,015,056	1,215,738	222,296	63,601	366,429	17,415	777,586	144,812	1,258,593	334,692
2004	1,016,092	1,216,978	222,523	63,666	366,803	17,432	778,379	144,960	1,259,877	335,033
2005	959,268	1,148,920	210,078	60,105	346,290	16,457	734,849	136,853	1,189,420	316,297
2006	1,038,026	1,243,248	1,213,645	65,040	501,286	17,809	795,182	148,089	1,287,074	342,266
2007	666,215	820,799	1,036,396	41,723	354,543	11,413	520,847	95,550	825,932	219,727
2008	999,433	1,167,531	1,157,440	61,924	478,719	17,175	757,686	144,009	1,367,672	325,069
2009	1,080,062	1,293,596	1,262,793	67,674	521,586	18,529	827,383	154,087	1,339,196	356,126
2010	1,033,467	1,237,788	1,283,384	64,754	524,108	17,731	824,481	147,438	1,281,421	340,762
2011	1,116,181	1,336,855	1,386,101	69,937	566,054	19,149	890,469	159,239	1,383,979	368,035
2012	1,090,934	1,315,850	1,073,158	67,263	523,945	18,453	731,452	154,732	1,323,822	351,925
2013	1,186,869	996,745	1,172,413	73,154	570,092	20,052	795,549	168,130	1,438,513	382,372
2014	2,231,951	1,800,967	2,118,348	132,169	1,030,991	36,232	1,437,696	303,861	2,602,055	691,649
<b>2015</b>	<b>2,777,943</b>	<b>2,241,459</b>	<b>2,641,005</b>	<b>164,507</b>	<b>1,284,241</b>	<b>45,131</b>	<b>1,872,028</b>	<b>378,528</b>	<b>3,237,538</b>	<b>860,687</b>
2016	2,798,320	2,257,901	2,660,377	165,714	1,293,661	45,462	1,885,760	381,305	3,261,286	867,000
2017	2,765,686	2,231,569	2,629,352	163,781	1,278,575	44,932	1,863,768	376,858	3,223,253	856,890
2018	2,510,157	2,025,388	2,386,419	148,649	1,160,444	40,780	1,691,570	342,039	2,925,448	777,719
2019	2,639,908	2,130,082	2,509,775	156,333	1,220,428	42,888	1,779,008	359,719	3,076,666	817,920
2020	2,498,685	2,016,132	2,375,513	147,970	1,155,140	40,594	1,683,839	340,476	2,912,078	774,165
2021	2,492,645	2,011,259	2,369,771	147,612	1,152,348	40,496	1,679,769	339,653	2,905,039	772,294
2022	2,407,082	1,942,219	2,288,425	142,545	1,112,792	39,106	1,622,108	327,994	2,805,320	745,783
2023	2,427,441	1,958,647	2,307,781	143,751	1,122,204	39,437	1,635,829	330,768	2,829,048	752,091
2024	2,363,707	1,907,221	2,247,188	139,976	1,092,740	38,401	1,592,878	322,083	2,754,769	732,345
2025	2,185,117	1,763,121	2,077,402	129,400	1,010,178	35,500	1,472,528	297,748	2,546,632	677,012
2026	2,060,483	1,662,557	1,958,912	122,020	952,560	33,475	1,388,539	280,766	2,401,379	638,397
2027	2,223,281	1,793,915	2,113,685	131,660	1,027,821	36,120	1,498,247	302,949	2,591,110	688,837
2028	1,804,189	1,455,759	1,715,252	106,842	834,075	29,311	1,215,825	245,842	2,102,682	558,990
2029	1,929,560	1,556,918	1,834,443	114,267	892,034	31,348	1,300,311	262,926	2,248,795	597,834
2030	378,187	305,151	359,544	22,396	174,836	6,144	254,856	51,533	440,756	117,173
2031	378,330	305,266	359,680	22,404	174,902	6,146	254,953	51,552	440,923	117,218
2032	378,371	305,299	359,719	22,407	174,921	6,147	254,980	51,558	440,970	117,230
2033	378,496	305,400	359,838	22,414	174,978	6,149	255,064	51,575	441,116	117,269
2034	378,277	305,223	359,630	22,401	174,877	6,146	254,917	51,545	440,861	117,201
2035	378,333	305,268	359,683	22,405	174,903	6,146	254,955	51,552	440,926	117,219
<b>TOTAL</b>	<b>59,591,775</b>	<b>51,579,858</b>	<b>50,428,718</b>	<b>3,602,185</b>	<b>26,751,807</b>	<b>989,005</b>	<b>40,451,156</b>	<b>8,177,052</b>	<b>71,148,910</b>	<b>18,861,039</b>

(a) 1988 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include bond cover.

**TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection District	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1971	0	0	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0	0	0
1988	24,019	2,642,354	18,118	3,150,527	1,336	552	853	2,741	0	4,317,328
1989	42,040	4,587,641	34,565	5,564,840	0	918	1,454	2,372	0	7,583,021
1990	38,023	4,037,980	34,994	4,917,308	2,535	800	1,283	4,618	0	6,750,020
1991	59,122	6,259,893	54,115	7,642,536	9,945	1,243	2,027	13,215	0	10,510,679
1992	80,131	8,435,312	72,892	10,351,553	13,671	1,710	2,806	18,187	0	14,255,669
1993	84,371	8,885,273	76,858	10,904,435	14,608	1,827	3,026	19,461	0	15,068,309
1994	85,698	8,926,755	76,794	10,959,041	14,409	1,801	3,070	19,280	0	15,145,690
1995	101,792	10,539,430	90,436	12,943,054	16,958	2,119	3,705	22,782	0	18,013,188
1996	124,074	12,810,359	109,783	15,730,703	20,640	2,579	4,620	27,839	0	21,369,059
1997	28,259	13,168,230	112,960	16,102,652	21,382	2,674	4,872	28,928	0	21,970,360
1998	27,174	12,662,268	108,619	15,483,941	20,562	2,571	4,685	27,818	0	21,126,192
1999	53,545	17,454,651	149,123	21,587,353	28,348	3,543	6,765	38,656	0	29,200,538
2000	70,117	19,805,800	168,259	25,135,976	32,271	9,794	7,996	50,061	0	33,737,389
2001	69,001	19,490,499	165,580	24,751,444	31,757	9,638	7,869	49,264	0	33,419,720
2002	71,126	20,091,004	170,682	25,534,301	32,736	9,935	8,112	50,783	0	34,452,492
2003	74,063	20,920,403	177,728	26,588,412	34,087	10,345	8,446	52,878	0	35,874,763
2004	74,138	20,941,743	177,910	26,615,534	34,121	10,356	8,456	52,933	0	35,911,363
2005	69,992	19,770,593	167,960	25,127,082	32,213	9,776	7,983	49,972	0	33,903,044
2006	75,738	20,330,228	181,750	27,239,381	34,858	10,579	8,638	54,075	0	36,735,870
2007	45,192	12,752,863	116,415	17,507,615	22,362	7,007	5,579	34,948	0	23,537,874
2008	250,631	19,303,204	173,561	26,204,054	32,180	9,751	7,973	49,904	0	35,188,221
2009	78,805	21,153,536	189,110	28,342,483	36,270	11,008	8,988	56,266	0	38,172,245
2010	75,405	20,240,944	180,952	27,252,635	34,705	10,532	8,600	53,837	0	36,525,441
2011	81,440	21,860,932	195,434	29,433,805	37,482	11,375	9,289	58,146	0	39,448,763
2012	215,055	22,686,017	191,051	29,343,657	35,313	101,156	12,344	148,813	0	41,009,352
2013	233,662	23,602,562	207,636	30,847,749	38,359	109,882	13,628	161,869	0	43,244,214
2014	422,653	42,670,698	375,172	55,854,442	69,454	198,959	25,501	293,914	0	78,240,723
<b>2015</b>	<b>525,953</b>	<b>53,118,787</b>	<b>467,025</b>	<b>69,614,832</b>	<b>86,899</b>	<b>248,931</b>	<b>33,020</b>	<b>368,850</b>	<b>0</b>	<b>97,458,837</b>
2016	529,811	53,508,425	470,451	70,125,473	87,536	250,757	33,262	371,555	0	98,173,718
2017	523,632	52,884,418	464,964	69,307,678	86,516	247,833	32,874	367,223	0	97,028,831
2018	475,253	47,998,279	422,005	62,904,150	78,522	224,935	29,837	333,294	0	88,064,067
2019	499,819	50,479,343	443,819	66,155,708	82,581	236,562	31,379	350,522	0	92,616,160
2020	473,081	47,778,919	420,076	62,616,668	78,163	223,907	29,701	331,771	0	87,661,601
2021	471,937	47,663,431	419,061	62,465,315	77,974	223,366	29,629	330,969	0	87,449,711
2022	455,737	46,027,317	404,676	60,321,104	75,298	215,698	28,612	319,608	0	84,447,875
2023	459,592	46,416,627	408,099	60,831,315	75,935	217,523	28,854	322,312	0	85,162,157
2024	447,525	45,197,917	397,384	59,234,134	73,941	211,811	28,096	313,848	0	82,926,146
2025	413,712	41,782,987	367,360	54,758,697	68,354	195,808	25,973	290,135	0	76,660,659
2026	390,115	39,399,793	346,406	51,635,402	64,456	184,640	24,492	273,588	0	72,288,135
2027	420,938	42,512,745	373,776	55,715,084	69,548	199,228	26,427	295,203	0	77,999,574
2028	341,590	34,499,036	303,319	45,212,712	56,438	161,673	21,445	239,556	0	63,296,545
2029	365,327	36,896,333	324,396	48,354,492	60,360	172,908	22,936	256,204	0	67,694,951
2030	71,603	7,231,551	63,580	9,477,310	11,830	33,889	4,495	50,214	0	13,267,971
2031	71,630	7,234,288	63,604	9,480,896	11,835	33,902	4,497	50,234	0	13,272,992
2032	71,638	7,235,066	63,611	9,481,917	11,836	33,906	4,498	50,240	0	13,274,423
2033	71,661	7,237,452	63,632	9,485,044	11,840	33,917	4,499	50,256	0	13,278,799
2034	71,620	7,233,279	63,596	9,479,573	11,833	33,897	4,496	50,226	0	13,271,140
2035	71,630	7,234,343	63,605	9,480,968	11,835	33,902	4,497	50,234	0	13,273,093
<b>TOTAL</b>	<b>9,879,070</b>	<b>1,165,601,508</b>	<b>10,192,902</b>	<b>1,517,254,985</b>	<b>1,896,092</b>	<b>3,971,423</b>	<b>642,087</b>	<b>6,509,602</b>	<b>0</b>	<b>2,103,278,912</b>

(a) 1988 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include bond cover.

**TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa County FC&WCD	Solano County WA	Total	Alameda County FC&WCD, Zone 7	Alameda County Water District	Santa Clara Valley Water District	Total	San Luis Obispo County FC&WCD	Santa Barbara County FC&WCD	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	11,750	43,787	21,132	76,669	0	0	0
1963	0	0	0	199,726	190,272	447,723	837,721	0	0	0
1964	0	0	0	263,282	277,455	621,356	1,162,093	6,696	21,667	28,363
1965	0	0	0	373,816	404,324	1,158,090	1,936,230	13,756	36,209	49,785
1966	18,063	0	18,063	419,467	421,723	1,412,953	2,254,143	26,524	61,349	87,873
1967	41,574	0	41,574	553,115	548,491	1,863,199	2,964,805	56,469	118,263	174,731
1968	128,628	0	128,628	683,008	633,184	2,178,466	3,494,658	115,961	229,807	345,768
1969	254,715	0	254,715	817,725	583,436	2,298,736	3,699,897	185,156	358,861	544,017
1970	277,547	0	277,547	904,084	640,297	2,787,966	4,332,348	200,150	387,675	587,825
1971	227,474	0	227,474	845,618	675,194	2,807,017	4,327,829	202,413	392,912	595,325
1972	224,978	0	224,978	929,747	822,396	3,027,748	4,779,891	209,057	406,589	615,646
1973	221,091	31,366	252,457	916,248	716,492	3,120,787	4,753,527	206,557	402,724	609,281
1974	240,498	32,938	273,437	956,891	746,932	3,325,023	5,028,846	208,545	407,090	615,635
1975	237,459	36,291	273,750	1,015,373	793,055	3,214,046	5,022,474	225,895	439,873	665,768
1976	271,292	40,836	312,127	1,128,475	943,464	3,362,541	5,434,480	228,976	447,299	676,275
1977	293,627	45,096	338,723	1,097,155	922,203	3,303,461	5,322,819	238,699	468,721	707,420
1978	273,870	49,178	323,048	1,186,025	935,818	3,712,581	5,834,424	245,331	484,259	729,590
1979	289,479	53,340	342,819	1,282,669	1,009,566	3,819,533	6,111,769	243,110	483,437	726,547
1980	310,846	86,073	396,919	1,435,715	1,173,798	4,119,072	6,728,585	282,254	540,553	822,807
1981	347,781	112,848	460,629	1,544,329	1,349,125	4,507,566	7,401,020	307,065	596,671	903,736
1982	438,335	141,835	580,171	1,624,729	1,369,535	4,941,393	7,935,657	328,215	682,545	1,010,760
1983	354,787	163,294	518,081	1,495,100	1,260,138	4,910,241	7,665,478	357,218	702,083	1,059,301
1984	467,336	246,698	714,034	1,805,189	1,478,395	6,870,249	10,153,833	409,529	801,057	1,210,586
1985	736,074	386,306	1,122,380	2,303,104	2,225,097	7,796,485	12,324,686	500,696	969,931	1,470,626
1986	1,120,086	714,246	1,834,332	2,171,803	2,014,104	8,193,845	12,379,751	536,751	1,038,031	1,574,782
1987	1,773,801	1,582,227	3,356,028	2,668,398	2,505,662	7,980,254	13,154,314	570,644	1,148,974	1,719,618
1988	2,349,572	2,524,763	4,874,335	2,729,642	2,774,430	7,830,285	13,334,357	673,071	1,439,620	2,112,691
1989	2,548,764	3,701,384	6,250,149	2,713,655	2,515,471	7,578,849	12,807,976	772,570	1,814,759	2,587,329
1990	2,900,024	3,848,934	6,748,958	3,149,016	2,929,775	8,355,392	14,434,183	933,367	2,046,370	2,979,737
1991	2,941,321	4,170,227	7,111,548	2,420,949	2,384,247	6,430,833	11,236,029	979,709	2,366,841	3,346,550
1992	2,797,728	4,144,992	6,942,720	2,895,423	2,927,115	7,656,940	13,479,478	1,118,807	2,526,861	3,645,668
1993	2,855,497	4,172,491	7,027,988	3,752,199	2,977,354	8,849,995	15,579,548	1,185,665	2,726,057	3,911,722
1994	2,987,937	4,225,292	7,213,229	3,789,292	3,586,255	9,613,545	16,989,092	1,335,974	3,518,042	4,854,015
1995	2,961,322	4,405,219	7,366,541	4,037,932	3,313,350	8,393,828	15,745,110	1,647,817	6,195,415	7,843,231
1996	3,045,021	4,898,210	7,943,232	3,645,771	3,178,398	9,228,554	16,052,722	2,592,042	15,232,542	17,824,585
1997	3,028,005	4,734,808	7,762,813	3,872,279	3,145,551	9,338,016	16,355,846	3,002,833	23,737,164	26,739,997
1998	2,936,062	4,588,897	7,524,960	3,479,120	3,201,607	9,077,806	15,758,533	3,254,940	28,393,640	31,648,580
1999	3,162,567	5,081,250	8,243,818	4,198,653	3,688,287	11,423,226	19,310,167	3,809,439	29,668,071	33,477,511
2000	3,462,955	5,631,508	9,094,463	5,788,298	3,583,917	10,187,021	19,559,237	3,763,597	30,355,972	34,119,569
2001	4,099,156	6,438,116	10,537,272	9,837,697	4,092,004	11,653,603	25,583,304	4,322,643	32,496,833	36,819,476
2002	4,331,166	6,602,336	10,933,501	13,351,967	4,086,852	13,155,628	30,594,446	4,045,011	32,176,511	36,221,522
2003	4,452,319	6,941,726	11,394,045	9,998,511	3,808,708	11,952,886	25,760,105	4,123,875	32,470,866	36,594,741
2004	4,991,745	7,312,200	12,303,946	8,375,006	4,208,138	11,648,598	24,231,742	4,192,688	33,016,499	37,209,186
2005	4,339,836	6,785,352	11,125,188	8,409,988	4,330,943	12,340,449	25,081,380	4,298,154	33,055,375	37,353,530
2006	4,315,909	6,370,709	10,686,618	8,462,663	4,365,367	12,568,110	25,396,139	4,181,197	32,831,362	37,012,559
2007	4,462,308	6,804,565	11,266,873	9,413,611	4,839,485	13,683,071	27,936,168	4,260,373	33,531,913	37,792,286
2008	5,237,674	6,827,706	12,065,380	10,600,554	5,227,357	14,109,519	29,937,431	4,837,248	35,176,092	40,013,340
2009	5,786,417	7,063,908	12,850,325	9,746,239	4,951,789	14,365,832	29,063,860	4,762,007	33,913,963	38,675,970
2010	6,406,549	8,799,706	15,206,255	11,197,622	5,605,649	15,916,180	32,719,451	5,290,059	36,372,116	41,662,175
2011	6,887,252	9,365,048	16,252,300	12,744,876	6,415,170	18,025,378	37,185,424	5,460,141	37,575,153	43,035,293
2012	7,441,659	9,301,259	16,742,918	13,853,319	6,512,349	20,535,992	40,901,660	5,557,189	38,213,974	43,771,164
2013	7,262,188	9,402,255	16,664,443	15,010,960	7,408,918	20,889,526	43,309,403	5,992,747	40,686,101	46,678,849
2014	8,165,422	10,622,611	18,788,033	15,439,115	7,491,059	21,849,108	44,779,282	6,255,801	39,859,947	46,115,748
2015	8,675,321	11,464,792	20,140,113	17,287,426	8,531,059	24,881,605	50,700,089	8,242,720	44,239,467	52,482,187
2016	8,659,592	11,426,763	20,086,355	17,594,339	8,527,513	25,473,630	51,595,481	8,286,707	44,573,828	52,860,535
2017	8,876,525	11,541,827	20,418,352	17,260,047	8,341,973	24,092,712	49,694,732	8,339,243	44,564,145	52,903,388
2018	8,709,026	11,471,952	20,180,978	16,838,917	8,156,914	23,583,547	48,579,379	8,197,589	44,120,230	52,317,819
2019	8,725,912	11,569,597	20,295,509	16,931,942	8,279,199	23,268,582	48,479,722	8,039,683	44,367,987	52,407,670
2020	8,695,343	11,556,512	20,251,855	16,850,121	8,245,183	23,191,289	48,286,593	8,029,850	44,283,058	52,312,908
2021	8,715,428	11,600,931	20,316,359	16,994,658	8,318,718	23,391,043	48,704,420	8,078,760	44,439,590	52,518,351
2022	8,705,587	11,610,056	20,315,643	16,928,742	8,286,010	23,325,607	48,540,359	8,065,385	44,392,793	52,458,178
2023	8,729,813	11,626,738	20,356,551	17,032,140	8,336,092	23,471,096	48,839,328	8,095,919	44,531,494	52,627,413
2024	8,724,629	11,642,679	20,367,308	16,937,037	8,287,097	23,371,642	48,595,776	8,072,309	44,481,887	52,554,196
2025	8,671,570	11,608,272	20,279,843	16,842,477	8,244,564	23,273,310	48,360,351	8,042,990	44,325,214	52,368,204
2026	8,646,490	11,599,456	20,245,946	16,821,369	8,237,360	23,266,640	48,325,369	8,040,195	44,271,071	52,311,265
2027	8,720,950	11,707,462	20,428,412	16,882,414	8,257,323	23,359,480	48,499,216	8,070,830	44,527,552	52,598,382
2028	8,597,739	11,580,792	20,178,531	16,867,908	8,269,138	23,360,862	48,497,909	8,055,222	44,202,920	52,258,142
2029	8,658,743	11,674,196	20,332,939	17,012,429	8,334,514	23,558,178	48,905,120	8,105,836	44,473,650	52,579,485
2030	8,146,148	11,081,057	19,227,206	15,794,732	7,780,435	22,072,787	45,647,954	7,749,755	42,460,242	50,209,997
2031	8,153,977	11,108,295	19,262,272	15,985,949	7,876,688	22,329,055	46,191,692	7,809,564	42,639,764	50,449,328
2032	8,164,133	11,136,106	19,300,239	15,919,457	7,839,218	22,267,352	46,026,026	7,794,187	42,671,085	50,465,272
2033	8,155,776	11,137,920	19,293,696	16,276,632	8,022,445	22,731,319	47,030,396	7,901,278	42,971,514	50,872,792
2034	8,106,502	11,110,921	19,217,423	16,072,220	7,912,639	22,496,865	46,481,725	7,852,852	42,923,774	50,776,625
2035	7,982,525	11,014,855	18,997,380	16,651,042	8,211,091	23,235,271	48,097,404	8,024,575	43,362,966	51,387,541
<b>TOTAL</b>	<b>303,927,449</b>	<b>408,759,226</b>	<b>712,686,674</b>	<b>583,328,892</b>	<b>310,528,662</b>	<b>908,461,509</b>	<b>1,802,319,062</b>	<b>267,450,079</b>	<b>1,575,848,688</b>	<b>1,843,298,767</b>

(a) Capital charges repaid through bond debt service prior to 2013 exclude bond cover, capital charges for 2014 and after include both bond debt service and bond cover.

**TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor<sup>a</sup>**

(in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								Total
	Dudley Ridge Water District	Empire West Side Irrigation District	Future Contractor San Joaquin Valley	Kern County Water Agency		County of Kings	Oak Flat Water District	Tulare Lake Basin Water Storage District	
				Municipal and Industrial	Agricultural				
	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]
1961	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0	0
1964	0	0	2,725	0	0	0	0	0	2,725
1965	0	0	6,029	73,569	0	0	0	0	79,598
1966	0	0	12,039	137,330	0	0	0	0	149,368
1967	0	0	26,257	267,611	0	0	0	0	293,869
1968	225,807	19,403	54,588	445,439	1,712,350	16,947	19,718	307,920	2,802,171
1969	241,987	11,002	87,576	525,094	2,734,804	16,825	19,458	461,080	4,097,826
1970	307,191	34,437	94,675	573,998	3,885,921	21,435	30,842	522,964	5,471,103
1971	328,738	37,165	95,695	605,889	5,172,036	27,176	34,770	714,325	7,015,793
1972	382,538	40,426	98,788	631,615	7,147,591	26,473	63,986	1,990,547	10,381,964
1973	399,984	39,048	97,550	1,025,888	7,295,682	28,816	39,364	784,056	9,710,389
1974	509,030	40,262	98,460	1,143,571	8,016,692	29,545	42,675	1,045,789	10,926,023
1975	681,933	40,710	106,703	1,196,448	9,402,248	31,240	48,294	1,559,566	13,067,143
1976	720,971	43,231	108,084	1,323,177	10,649,796	32,666	52,244	1,444,351	14,374,522
1977	581,210	39,149	112,554	1,365,869	10,970,829	34,434	54,340	1,140,183	14,298,567
1978	699,860	36,029	115,521	1,564,175	13,300,362	38,927	59,162	1,174,340	16,988,376
1979	783,485	47,984	114,253	1,668,163	15,376,891	43,064	70,757	1,728,640	19,833,236
1980	964,565	49,720	125,950	1,770,264	17,034,644	48,021	95,125	1,674,898	21,763,186
1981	1,213,504	84,086	134,169	2,427,527	22,643,771	66,495	100,779	2,286,129	28,956,461
1982	1,249,620	70,279	135,057	2,516,846	25,046,234	70,662	108,432	2,281,000	31,478,130
1983	1,183,985	52,630	149,202	2,085,047	24,689,576	75,443	87,560	507,111	28,830,554
1984	1,493,586	28,612	164,505	3,352,672	33,466,901	94,321	121,581	1,543,657	40,265,836
1985	1,769,497	130,042	184,905	3,876,681	39,410,710	117,584	139,666	2,817,622	48,446,705
1986	2,011,446	79,419	180,445	4,079,837	43,488,140	136,715	153,328	3,657,603	53,786,933
1987	1,886,759	95,337	179,872	4,557,695	42,788,329	137,333	151,570	3,750,680	53,547,575
1988	1,971,846	109,715	193,735	4,704,494	44,745,002	138,279	146,736	3,905,339	55,915,146
1989	2,126,608	101,843	187,913	4,652,237	46,934,233	137,085	166,568	4,386,918	58,693,405
1990	1,884,882	87,045	221,392	4,799,306	45,716,464	121,153	148,874	3,965,260	56,944,376
1991	1,691,377	80,335	220,282	4,535,868	37,563,532	103,909	134,884	3,506,270	47,836,458
1992	2,237,279	105,154	241,455	5,540,058	48,770,737	143,783	175,867	4,545,100	61,759,434
1993	2,459,434	120,157	264,959	5,775,636	54,692,220	161,521	195,432	5,298,954	68,968,313
1994	2,264,257	107,662	306,359	5,200,567	52,142,077	145,625	178,244	4,671,654	65,016,444
1995	2,860,717	115,581	304,297	6,613,715	60,600,266	180,802	210,577	5,530,488	76,416,442
1996	2,053,095	125,270	389,203	6,666,563	58,677,014	178,474	190,189	7,096,253	75,376,061
1997	2,764,358	100,674	276,681	6,429,190	57,543,704	138,117	212,389	4,718,384	72,183,496
1998	2,610,039	119,966	381,847	5,733,156	54,025,834	143,433	203,999	4,971,684	68,189,957
1999	2,705,759	136,279	369,935	6,368,370	57,698,136	184,155	218,991	7,440,035	75,121,660
2000	2,586,447	120,475	302,623	6,090,727	51,154,615	173,622	212,922	6,145,786	66,787,217
2001	3,277,064	145,850	328,030	5,650,980	58,693,582	192,421	259,861	6,450,093	74,997,880
2002	2,986,397	127,704	320,646	6,166,342	53,527,875	187,288	238,802	5,784,551	69,339,606
2003	3,037,550	131,560	340,169	6,530,982	56,070,091	202,251	238,074	6,069,177	72,619,853
2004	3,223,542	168,096	342,218	7,843,590	56,635,394	355,137	253,533	5,824,942	74,646,454
2005	3,777,212	176,470	355,392	6,995,648	67,121,149	688,018	250,147	6,653,059	86,017,095
2006	3,589,509	166,698	294,884	7,455,481	63,951,945	532,519	254,655	5,862,519	82,108,209
2007	3,393,419	158,697	332,686	7,095,927	61,099,834	519,721	252,402	5,824,375	78,677,061
2008	3,362,360	156,258	469,102	7,725,136	61,937,860	544,162	260,434	5,515,172	79,970,483
2009	3,271,021	154,615	433,629	6,909,020	61,001,686	522,860	261,471	5,457,708	78,012,010
2010	3,657,701	237,178	509,790	8,098,254	72,703,267	654,878	329,556	6,541,252	92,731,875
2011	4,551,196	218,574	504,541	9,701,941	90,193,740	737,864	356,620	6,901,084	113,165,560
2012	3,732,603	231,137	469,091	9,796,347	83,618,190	765,653	366,525	7,887,925	106,867,470
2013	4,295,581	236,739	542,511	10,521,418	87,586,817	764,751	387,470	7,489,476	111,824,763
2014	4,109,292	222,381	722,260	10,655,306	91,290,547	717,891	386,536	7,008,250	115,112,461
2015	4,919,953	290,075	636,343	14,123,818	105,862,166	943,644	485,721	9,130,796	136,392,517
2016	4,856,494	286,939	648,512	13,964,051	104,779,517	937,081	482,234	9,015,916	134,970,743
2017	4,844,618	286,323	668,383	13,733,820	104,295,929	934,976	480,574	8,994,698	134,239,321
2018	4,715,106	279,016	651,403	13,291,052	102,128,206	902,729	465,127	8,758,498	131,191,137
2019	4,685,484	282,552	648,558	13,450,797	103,139,135	913,009	472,794	8,892,641	132,484,971
2020	4,360,233	281,563	652,431	13,373,193	102,822,466	909,586	469,936	8,851,106	131,720,515
2021	4,417,062	285,481	657,063	13,518,752	104,018,054	921,595	476,915	8,966,553	133,261,474
2022	4,376,508	282,951	662,240	13,393,787	103,288,206	913,628	471,532	8,884,118	132,272,971
2023	4,415,332	285,524	667,666	13,504,665	104,151,929	921,582	475,883	8,961,968	133,384,549
2024	4,353,834	281,463	673,057	13,311,178	102,942,593	908,922	468,100	8,836,008	131,775,154
2025	4,317,698	279,582	678,463	13,212,148	102,262,484	902,935	464,000	8,764,833	130,882,144
2026	4,300,610	278,820	684,225	13,154,600	101,907,674	900,469	462,474	8,731,425	130,420,298
2027	4,294,053	277,723	689,671	13,132,132	101,991,381	897,124	459,408	8,712,693	130,454,185
2028	4,324,237	281,320	693,387	13,233,715	102,467,317	907,935	466,164	8,783,319	131,157,394
2029	4,368,152	283,855	699,284	13,358,230	103,497,171	915,822	470,235	8,869,008	132,461,758
2030	3,909,787	257,821	705,269	12,063,303	93,943,878	834,073	420,872	7,964,545	120,099,547
2031	4,007,030	264,509	710,018	12,366,193	96,141,605	854,425	431,765	8,162,627	122,938,172
2032	3,933,121	259,350	716,407	12,097,007	94,485,695	838,453	423,413	8,009,562	120,763,009
2033	4,118,350	272,128	722,535	12,691,025	98,505,917	877,967	445,246	8,388,122	126,021,290
2034	3,979,388	262,466	728,446	12,223,406	95,598,974	847,869	428,140	8,101,576	122,170,264
2035	4,302,976	284,819	734,311	13,271,858	102,612,687	916,981	466,466	8,763,961	131,354,059
<b>TOTAL</b>	<b>189,916,263</b>	<b>10,825,365</b>	<b>26,438,900</b>	<b>497,939,393</b>	<b>4,110,772,305</b>	<b>29,330,298</b>	<b>17,672,046</b>	<b>369,388,143</b>	<b>5,252,282,711</b>

(a) Capital charges repaid through bond debt service prior to 2013 exclude bond cover, capital charges for 2014 and after include both bond debt service and bond cover.

**TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor<sup>a</sup>**

(in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	Antelope Valley - East Kern Water Agency	Castaic Lake Water Agency	Coachella Valley Water District	Crestline - Lake Arrowhead Water Agency	Desert Water Agency	Littlerock Creek Irrigation District	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	San Gabriel Valley Municipal Water District
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	0	0
1963	34,411	0	0	0	726	0	0	0	51,729	0
1964	64,494	27,447	19,542	4,370	38,211	1,143	30,324	8,205	82,811	34,987
1965	121,484	53,007	34,348	7,194	42,701	2,082	53,730	15,222	135,069	35,344
1966	221,012	101,264	62,476	12,478	76,886	3,753	96,944	27,679	232,502	61,465
1967	427,622	210,814	121,269	23,472	148,839	7,284	188,141	54,023	433,350	115,574
1968	754,401	491,432	218,649	41,509	265,168	12,870	335,901	95,466	782,163	208,927
1969	1,090,136	742,572	334,105	61,226	394,024	18,693	500,020	138,063	1,205,834	321,755
1970	1,420,639	942,649	470,423	89,700	552,223	25,231	691,405	184,837	1,778,187	467,573
1971	1,760,670	1,137,223	627,331	128,360	754,065	31,837	930,568	231,280	2,538,219	659,414
1972	2,245,384	1,382,540	819,635	179,685	1,035,804	43,430	1,260,538	287,620	3,741,482	950,297
1973	2,399,515	1,431,093	965,166	190,549	1,254,443	45,890	1,355,314	313,446	3,974,200	961,024
1974	2,520,352	1,526,699	993,985	203,642	1,298,337	48,770	1,415,581	331,702	4,448,225	1,104,491
1975	2,737,867	1,617,898	1,044,902	218,979	1,377,168	53,125	1,503,512	355,270	4,631,803	1,208,047
1976	3,199,620	1,654,673	1,103,708	231,758	1,469,992	57,620	1,580,767	381,276	4,831,375	1,278,740
1977	3,182,178	1,742,655	1,008,676	244,149	1,317,096	54,160	1,668,976	406,620	5,061,165	1,336,313
1978	3,626,133	1,875,868	1,205,609	255,071	1,613,048	56,760	1,717,068	420,026	5,090,094	1,374,033
1979	4,296,348	1,955,814	1,292,485	267,366	1,735,593	60,256	1,892,040	449,757	5,136,830	1,342,135
1980	4,994,298	2,094,345	1,406,781	295,350	1,941,392	67,604	2,066,402	499,051	5,647,604	1,485,140
1981	5,824,304	2,563,870	1,574,217	328,818	2,194,094	100,752	2,389,635	603,265	6,461,840	1,688,324
1982	5,582,860	2,727,073	1,657,630	346,721	2,336,914	82,296	2,363,184	641,991	6,752,799	1,929,664
1983	6,335,170	2,797,843	2,181,785	380,840	3,172,326	88,383	2,560,813	658,613	6,964,704	1,808,748
1984	7,713,111	3,876,684	3,287,286	497,586	4,929,764	96,492	2,828,370	727,821	8,053,209	2,598,232
1985	9,545,818	4,342,910	4,122,839	601,928	6,265,165	103,706	3,019,459	959,657	8,893,342	2,686,799
1986	9,515,134	4,978,492	4,584,188	647,633	7,009,695	130,221	3,203,781	1,223,847	9,142,822	3,398,539
1987	9,550,203	4,836,132	4,452,838	678,086	6,885,935	240,872	3,259,008	1,255,052	10,544,337	3,398,921
1988	9,149,230	5,023,027	4,510,360	704,412	7,052,631	158,845	3,433,785	1,044,206	11,095,194	3,271,137
1989	11,039,912	5,032,460	4,218,204	691,191	6,635,388	210,635	3,515,102	1,746,763	10,811,989	3,453,680
1990	12,432,751	5,500,598	4,916,383	729,229	7,720,886	331,172	3,748,642	1,953,905	11,722,947	4,221,266
1991	9,293,532	4,614,361	3,471,782	688,867	5,335,009	221,166	4,608,900	1,640,084	11,104,874	3,642,611
1992	11,850,715	5,803,050	3,626,099	612,895	5,587,382	174,998	5,587,519	1,532,325	11,144,101	3,694,099
1993	12,264,759	5,449,713	3,830,889	617,198	5,922,476	211,904	5,479,061	1,753,971	12,107,175	4,042,324
1994	14,334,329	6,016,172	3,857,907	694,421	5,963,596	278,012	6,430,761	2,090,725	12,731,705	4,776,753
1995	14,201,115	6,391,819	4,680,553	661,811	7,318,575	212,244	5,623,716	1,952,494	12,204,445	4,480,933
1996	14,628,006	6,622,963	7,634,302	710,651	12,187,480	208,357	5,722,083	2,300,206	12,730,932	4,599,073
1997	15,198,058	6,516,617	7,251,238	750,418	8,515,791	207,887	6,144,869	2,342,198	14,400,157	4,897,487
1998	13,714,014	6,139,423	6,324,675	717,140	7,018,227	209,057	7,747,889	1,946,444	14,309,132	4,177,167
1999	15,562,020	6,735,796	5,377,230	826,782	7,205,669	215,608	8,412,177	2,368,501	15,799,362	5,133,387
2000	14,733,125	10,206,268	3,766,671	791,354	5,542,843	186,686	8,285,443	2,066,975	15,500,692	4,235,367
2001	24,967,356	15,918,982	4,880,883	997,863	7,636,567	199,182	9,000,151	4,006,031	21,532,980	4,400,957
2002	16,401,461	13,148,219	4,133,231	961,219	6,403,065	182,287	8,166,953	3,394,240	22,465,925	5,804,417
2003	17,749,327	14,207,190	4,253,805	931,527	6,600,208	187,490	9,824,942	2,928,949	20,880,420	5,973,161
2004	18,917,868	15,472,392	4,930,875	1,043,438	6,718,669	201,461	10,102,347	3,213,911	25,422,620	5,471,257
2005	19,225,330	14,426,177	18,578,343	863,461	11,592,435	190,039	9,838,843	3,248,721	23,379,608	5,706,831
2006	20,956,766	13,762,656	31,822,283	856,127	11,743,193	202,156	12,702,003	3,212,368	23,351,039	5,795,955
2007	24,166,114	16,798,844	30,538,934	1,083,189	11,107,932	201,022	16,280,481	4,709,865	29,170,286	4,850,759
2008	22,092,570	19,141,961	30,312,882	1,033,585	12,193,606	217,075	14,905,579	4,690,347	29,919,756	5,938,471
2009	20,201,516	17,095,154	28,171,763	1,024,580	10,146,837	222,150	14,737,825	4,467,157	29,774,985	6,473,383
2010	24,006,997	17,614,825	38,449,367	980,878	13,663,361	228,293	18,000,875	3,987,468	33,086,629	8,239,047
2011	30,834,761	17,654,373	40,399,937	1,062,130	14,815,711	251,765	11,923,972	4,026,497	30,687,585	9,028,828
2012	31,820,501	19,767,559	47,864,294	1,182,205	17,569,714	268,549	13,788,090	5,559,685	44,829,246	9,500,990
2013	27,973,637	23,303,272	39,688,818	1,452,821	14,515,355	301,038	14,362,548	4,792,831	36,465,808	7,907,096
2014	23,693,482	24,832,849	34,579,622	1,890,338	12,412,484	341,522	14,587,700	4,720,039	39,225,569	7,047,383
<b>2015</b>	<b>38,109,483</b>	<b>27,343,142</b>	<b>48,861,422</b>	<b>2,091,827</b>	<b>18,356,813</b>	<b>613,445</b>	<b>25,385,537</b>	<b>5,590,363</b>	<b>47,538,602</b>	<b>10,319,246</b>
2016	37,249,198	27,019,245	49,356,713	2,070,219	18,083,510	603,317	25,236,816	5,462,939	47,334,862	10,190,489
2017	37,597,076	27,026,640	50,371,789	2,069,120	18,353,415	611,211	25,407,288	5,518,891	47,388,983	10,271,207
2018	38,063,173	27,094,254	51,289,915	2,087,551	18,584,956	618,276	25,724,786	5,591,617	47,613,858	10,336,205
2019	36,348,863	23,700,817	50,714,381	2,024,029	18,135,287	597,151	26,745,907	5,397,888	46,561,823	10,036,046
2020	36,449,146	23,681,347	51,040,200	2,016,149	18,142,997	597,708	27,375,030	5,410,569	46,292,919	9,970,738
2021	36,378,366	23,740,825	50,704,027	1,992,067	18,018,572	595,590	27,272,421	5,397,034	45,866,366	9,865,302
2022	36,257,036	23,702,091	49,938,248	1,976,927	17,854,730	593,485	27,165,850	5,379,907	45,547,943	9,785,483
2023	36,471,192	24,013,749	49,521,999	1,987,190	17,843,432	596,917	27,332,354	5,411,577	45,664,093	9,813,448
2024	35,965,058	23,805,936	48,951,593	1,961,155	17,619,712	588,750	26,940,577	5,336,201	45,239,135	9,692,684
2025	35,926,351	23,912,439	48,961,890	1,958,286	17,612,660	588,187	26,962,583	5,332,959	45,198,621	9,678,549
2026	35,530,737	23,785,143	48,495,206	1,938,684	17,419,748	581,806	26,665,496	5,275,130	44,825,474	9,569,723
2027	36,011,066	24,141,329	49,032,834	1,964,682	17,651,263	589,689	27,027,911	5,345,170	45,338,336	9,704,161
2028	35,720,056	24,043,926	48,773,549	1,946,345	17,508,546	585,027	26,821,746	5,307,352	44,982,592	9,604,560
2029	36,146,031	24,394,714	49,288,897	1,969,111	17,720,653	592,029	27,127,294	5,369,819	45,456,814	9,728,377
2030	33,917,860	22,813,686	47,197,519	1,851,333	16,747,678	555,903	25,653,543	5,056,716	43,223,381	9,120,882
2031	35,398,923	23,608,980	48,762,232	1,916,867	17,373,558	580,036	26,695,495	5,280,465	44,415,636	9,449,059
2032	33,443,239	22,770,871	46,857,313	1,833,841	16,598,278	548,301	25,336,425	4,986,110	43,033,857	9,053,586
2033	35,756,459	24,119,478	49,233,733	1,938,019	17,546,076	586,023	27,001,375	5,336,263	44,818,332	9,547,020
2034	33,640,730	23,201,127	47,255,112	1,847,545	16,739,601	551,711	25,569,868	5,019,980	43,359,548	9,130,459
2035	38,127,354	25,484,662	51,716,225	2,040,373	18,528,203	624,695	28,614,298	5,697,940	46,686,178	10,056,591
<b>TOTAL</b>	<b>1,339,078,918</b>	<b>881,712,120</b>	<b>1,491,985,998</b>	<b>71,977,523</b>	<b>669,674,387</b>	<b>19,853,089</b>	<b>847,936,342</b>	<b>204,471,583</b>	<b>1,638,858,209</b>	<b>382,142,119</b>

(a) Capital charges repaid through bond debt service prior to 2013 exclude bond cover, capital charges for 2014 and after include both bond debt service and bond cover.



**TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor <sup>a</sup>**

(in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	San Gorgonio Pass Water Agency	The Metropolitan Water District of Southern California	Ventura County Watershed Protection	Total	City of Yuba City	County of Butte	Plumas County FC&WCD	Total		
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1961	0	0	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0	3,219	79,888
1963	0	690,812	0	777,678	0	0	0	0	12,626	1,628,026
1964	21,735	1,260,513	9,378	1,603,161	0	0	0	0	13,938	2,810,279
1965	21,866	2,180,589	17,766	2,720,401	0	0	405	405	28,937	4,815,355
1966	37,964	3,900,172	33,426	4,868,023	0	0	565	565	31,321	7,409,357
1967	71,283	7,693,703	68,155	9,563,529	0	0	562	562	47,718	13,086,788
1968	128,915	15,317,881	142,803	18,796,086	0	1,050	1,439	2,489	46,945	25,616,744
1969	198,764	23,153,064	215,209	28,373,466	0	1,225	4,120	5,345	52,963	37,028,228
1970	289,633	30,617,164	273,605	37,803,268	0	3,848	17,116	20,964	69,744	48,562,799
1971	409,327	39,958,997	342,425	49,509,717	0	4,546	19,187	23,733	55,532	61,755,402
1972	537,186	54,896,379	422,304	67,802,286	0	4,929	21,150	26,079	80,412	83,911,256
1973	587,963	59,450,695	435,655	73,364,953	0	7,059	21,778	28,837	54,219	88,773,662
1974	611,428	65,819,846	455,565	80,778,622	0	8,336	22,408	30,744	76,783	97,730,089
1975	644,621	71,630,821	478,403	87,502,415	0	9,416	23,523	32,939	84,547	106,649,034
1976	668,315	74,675,280	475,587	91,608,712	0	7,004	23,257	30,261	106,717	112,543,094
1977	696,515	73,158,031	507,063	90,383,597	0	16,917	24,059	40,976	107,618	111,190,719
1978	709,040	81,722,902	523,177	100,188,828	0	12,635	24,225	36,860	100,786	124,201,912
1979	712,866	83,375,703	526,405	103,043,599	0	16,575	28,352	44,927	119,532	130,222,248
1980	862,275	93,029,351	583,628	114,973,223	0	19,834	26,562	46,396	178,812	144,909,928
1981	946,961	112,171,493	672,540	137,520,112	0	21,682	34,563	56,245	185,347	175,483,550
1982	1,021,329	117,143,300	727,623	143,313,385	0	16,117	43,117	59,234	173,894	184,551,230
1983	1,076,279	118,991,007	854,263	147,870,774	0	15,202	29,410	44,612	220,926	186,209,726
1984	1,211,621	156,273,535	933,311	193,027,022	20,590	15,442	31,795	67,827	225,959	245,665,097
1985	1,287,789	195,493,271	993,651	238,316,332	24,050	16,976	32,405	73,431	340,322	302,094,483
1986	1,344,770	218,331,684	1,058,276	264,569,083	31,753	18,145	33,596	83,494	279,227	334,507,603
1987	1,379,613	204,859,482	1,056,318	252,396,798	37,071	17,794	33,384	88,249	345,116	324,607,697
1988	1,465,829	221,667,115	1,124,102	269,699,871	48,058	19,117	33,605	100,780	365,207	346,402,387
1989	1,505,481	230,328,277	1,232,379	280,421,461	61,184	20,809	37,188	119,181	422,329	361,301,829
1990	1,624,763	277,194,766	1,855,991	333,953,299	66,041	20,855	36,812	123,708	474,284	415,658,544
1991	1,720,878	221,887,061	1,549,955	269,779,079	180,212	22,526	42,200	244,938	214,683	339,769,285
1992	1,779,902	245,365,618	1,503,480	298,262,184	208,216	26,028	43,517	277,761	443,676	384,810,920
1993	1,943,336	219,238,180	1,551,253	274,412,240	209,613	26,203	47,588	283,404	599,571	370,782,787
1994	1,920,217	257,365,883	1,475,069	317,935,551	201,284	25,161	46,079	272,524	609,966	412,890,822
1995	1,982,808	225,863,369	1,568,401	287,142,281	216,945	27,118	50,022	294,085	534,971	395,342,661
1996	1,651,239	235,410,311	1,622,641	306,028,246	217,250	27,155	56,622	301,027	571,857	424,097,729
1997	1,758,607	245,453,566	1,777,266	315,214,159	236,300	29,847	59,915	326,062	428,638	439,011,010
1998	1,947,195	227,090,227	1,796,534	293,137,124	128,021	29,927	36,222	194,170	465,095	416,918,419
1999	2,267,918	256,513,586	1,879,946	328,297,983	254,675	31,834	40,585	327,094	584,116	465,362,348
2000	2,540,961	251,052,784	1,962,049	320,871,219	262,163	79,001	43,704	384,868	0	450,816,574
2001	3,485,450	443,890,289	2,264,348	543,181,041	261,699	93,471	45,056	400,226	0	691,519,200
2002	4,834,837	333,568,548	2,304,992	421,769,394	266,107	95,018	47,297	408,422	0	569,266,892
2003	6,119,762	361,766,751	2,322,370	453,745,901	262,547	93,638	68,957	425,142	0	600,539,790
2004	6,478,520	412,858,085	2,607,272	513,438,716	284,387	102,404	29,286	416,077	0	662,246,120
2005	6,759,424	383,975,296	2,081,415	499,865,922	280,033	727,066	28,810	1,035,909	0	660,479,024
2006	7,273,261	360,984,128	2,050,919	494,712,854	292,991	43,185	38,579	374,755	0	650,291,135
2007	7,900,142	439,578,529	2,537,009	588,923,106	291,100	40,957	46,070	378,127	0	744,973,620
2008	9,660,998	413,818,173	3,006,456	566,931,459	306,916	804,536	86,478	1,197,930	0	730,116,023
2009	9,762,305	381,014,356	2,867,453	525,959,464	328,896	855,850	90,621	1,275,367	0	685,836,996
2010	10,981,608	443,700,071	3,055,185	615,993,704	400,358	1,064,565	108,862	1,573,785	0	799,887,246
2011	11,826,233	493,222,886	3,129,352	668,864,030	451,483	1,197,315	121,974	1,770,772	0	880,273,378
2012	12,902,904	490,975,189	3,451,070	699,479,996	460,139	1,318,107	130,899	1,909,145	0	909,672,353
2013	13,738,762	495,708,427	3,518,696	683,729,110	483,119	1,383,934	141,301	2,008,354	0	904,214,922
2014	16,845,810	475,962,318	3,293,735	659,432,852	500,727	1,434,375	151,064	2,086,166	0	886,314,543
2015	<b>18,021,787</b>	<b>594,434,428</b>	<b>3,950,075</b>	<b>840,616,171</b>	<b>602,896</b>	<b>1,727,045</b>	<b>187,654</b>	<b>2,517,595</b>	<b>0</b>	<b>1,102,848,673</b>
2016	18,082,566	586,481,194	3,910,381	831,081,450	603,533	1,728,871	193,033	2,525,437	0	1,093,120,000
2017	18,140,499	587,647,279	3,888,518	834,291,914	602,513	1,725,947	192,636	2,521,096	0	1,094,068,803
2018	18,178,206	589,887,330	3,823,600	838,893,728	594,519	1,703,049	189,598	2,487,166	0	1,093,650,206
2019	18,002,652	571,159,065	4,828,513	814,252,424	598,578	1,714,676	188,515	2,501,769	0	1,070,422,065
2020	17,975,786	569,916,051	4,810,803	813,679,443	594,160	1,702,021	174,909	2,471,090	0	1,068,722,404
2021	17,929,360	566,136,079	4,780,848	808,676,856	593,971	1,701,480	174,013	2,469,464	0	1,065,946,923
2022	17,893,212	560,534,561	4,740,558	801,370,031	591,295	1,693,812	171,612	2,456,719	0	1,057,413,901
2023	17,919,974	562,936,497	4,771,824	804,284,245	591,932	1,695,637	171,855	2,459,424	0	1,061,951,511
2024	17,858,789	553,947,567	4,699,864	792,607,020	589,938	1,689,925	171,098	2,450,961	0	1,048,350,415
2025	17,856,811	553,103,697	4,692,467	791,785,500	584,351	1,673,922	168,975	2,427,248	0	1,046,103,289
2026	17,806,950	546,811,590	4,646,315	783,352,003	580,453	1,662,754	167,494	2,410,701	0	1,037,065,584
2027	17,905,067	554,140,900	4,704,272	793,556,681	585,545	1,677,342	169,429	2,432,316	0	1,047,969,192
2028	17,859,074	548,190,195	4,652,440	785,995,407	572,435	1,639,787	164,447	2,376,669	0	1,040,464,052
2029	17,950,172	554,478,856	4,698,567	794,921,334	576,357	1,651,022	165,937	2,393,316	0	1,051,593,954
2030	17,595,307	515,417,876	4,360,730	743,512,415	527,827	1,512,003	147,497	2,187,327	0	980,884,447
2031	17,808,763	532,761,323	4,478,669	768,530,007	527,832	1,512,016	147,500	2,187,348	0	1,009,558,819
2032	17,588,161	508,270,991	4,291,392	734,612,365	527,833	1,512,020	147,501	2,187,354	0	973,354,266
2033	17,901,372	537,357,467	4,511,027	775,652,647	527,837	1,512,031	147,504	2,187,372	0	1,021,058,192
2034	17,667,982	512,302,482	4,318,628	740,604,773	527,830	1,512,011	147,502	2,187,343	0	981,438,154
2035	18,241,452	565,597,982	4,712,577	816,128,531	527,832	1,512,016	147,503	2,187,351	0	1,068,152,266
TOTAL	544,341,151	22,622,762,874	165,467,947	30,880,262,260	19,303,395	44,334,121	5,742,504	69,380,020	8,748,370	40,568,977,865

(a) Capital charges repaid through bond debt service prior to 2013 exclude bond cover, capital charges for 2014 and after include both bond debt service and bond cover.

**TABLE B-24 Equivalent Unit Charge for Water Supply for Each Contractor<sup>a</sup>**

(in dollars per acre-foot)

Project Service Area and Water Supply Contractor	Transportation Charge					Delta Water Charge	Water System Revenue Bond Surcharge	Total Equivalent Unit Charge
	Capital Cost Component	Minimum OMP&R Component	Off-Aqueduct Component	Variable OMP&R Component	Total			
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
<b>FEATHER RIVER AREA</b>								
City of Yuba City	0.00	0.00	0.00	0.00	0.00	121.85	13.33	135.18
County of Butte	0.00	0.00	0.00	0.00	0.00	419.11	40.44	459.55
Plumas County Flood Control and Water Conservation District	36.41	4.02	0.00	0.00	40.43	64.45	9.24	114.12
Feather River Area	8.33	0.92	0.00	0.00	9.25	186.95	19.53	215.73
<b>NORTH BAY AREA</b>								
Napa County Flood Control and Water Conservation District	175.03	73.53	4.84	17.05	270.45	38.64	16.78	325.86
Solano County Water Agency	103.85	70.59	5.30	10.22	189.95	44.92	13.39	248.27
North Bay Area	130.42	71.68	5.13	12.77	220.00	42.57	14.66	277.23
<b>SOUTH BAY AREA</b>								
Alameda County Flood Control and Water Conservation District, Zone 7	50.48	58.21	9.18	21.94	139.81	41.77	9.59	191.17
Alameda County Water District	30.29	34.36	7.49	14.27	86.42	29.65	5.07	121.14
Santa Clara Valley Water District	24.75	25.48	6.64	11.40	68.27	19.42	3.45	91.14
South Bay Area	29.91	32.35	7.20	13.61	83.07	24.79	4.73	112.58
<b>SAN JOAQUIN VALLEY AREA</b>								
County of Kings	6.20	9.62	3.81	8.29	27.92	33.75	3.94	65.61
Dudley Ridge Water District	5.44	6.08	3.37	4.87	19.75	19.92	2.25	41.93
Empire West Side Irrigation District	2.20	5.63	2.54	4.61	14.98	22.30	1.84	39.12
Kern County Water Agency	9.90	11.96	5.12	6.95	33.92	24.57	2.94	61.44
Oak Flat Water District	2.20	3.06	2.04	3.12	10.42	20.93	1.85	33.20
Tulare Lake Basin Water Storage District	5.57	6.13	3.26	4.81	19.77	20.71	2.29	42.77
San Joaquin Valley Area	9.15	10.98	4.81	6.59	31.52	23.94	2.84	58.30
<b>CENTRAL COASTAL AREA</b>								
San Luis Obispo County Flood Control and Water Conservation District	393.13	274.43	13.82	124.93	806.31	179.27	47.74	1,033.32
Santa Barbara County Flood Control and Water Conservation District	1131.99	313.93	21.04	103.48	1,570.44	97.59	80.26	1,748.29
Central Coastal Area	963.63	304.93	19.39	108.37	1,396.33	116.20	72.85	1,585.38
<b>SOUTHERN CALIFORNIA AREA</b>								
Antelope Valley-East Kern Water Agency	56.53	59.13	33.11	70.55	219.31	51.14	9.93	280.38
Castaic Lake Water Agency	60.35	64.38	25.83	43.92	194.48	44.56	12.78	251.81
Coachella Valley Water District	82.55	99.16	43.96	81.86	307.53	46.56	11.60	365.69
Crestline-Lake Arrowhead Water Agency	156.39	153.63	34.68	88.45	433.15	74.67	20.50	528.32
Desert Water Agency	52.89	58.09	52.87	46.41	210.26	30.52	7.50	248.28
Litterock Creek Irrigation District	93.85	98.52	30.16	73.41	295.94	82.80	15.81	394.55
Mojave Water Agency	162.51	196.55	30.04	152.75	541.84	123.64	30.29	695.77
Palmdale Water District	65.58	73.09	44.05	96.63	279.34	66.97	11.82	358.13
San Bernardino Valley Municipal Water District	266.40	215.68	31.37	84.00	597.45	88.13	25.73	711.32
San Gabriel Valley Municipal Water District	122.01	121.89	48.22	52.90	345.02	55.70	15.54	416.26
San Geronio Pass Water Agency	1396.03	597.28	36.64	256.89	2,286.83	144.11	43.57	2,474.51
The Metropolitan Water District of Southern California	90.54	78.63	39.72	47.02	255.91	46.06	12.01	313.98
Ventura County Watershed Protection District	361.49	319.75	27.91	126.64	835.79	201.95	53.20	1,090.95
Southern California Area	94.30	83.44	39.22	51.98	268.92	48.32	12.47	329.72
<b>ALL AREAS</b>	<b>54.73</b>	<b>47.38</b>	<b>20.65</b>	<b>28.21</b>	<b>150.97</b>	<b>35.82</b>	<b>7.79</b>	<b>194.58</b>

(a) Hypothetical charges, which, if assessed on all Table A water delivered to date, all surplus water delivered prior to May 1, 1973, and all Table A water estimated to be delivered during the remainder of the project repayment period (Table B-5B), would provide a sum at the end of the period financially equivalent to all Transportation Charge and Delta Water Charge payments required under a water supply contract, considering interest at the Project Interest Rate, 4.610 percent per annum.

**TABLE B-25 Equivalent Unit Transportation Costs of Water Delivered from or through Each Aqueduct Reach <sup>a</sup>**

(in dollars per acre-foot)

Aqueduct Reach	Unit Costs of Reach (b)						Cumulative Unit Costs from the Delta					
	Capital Costs	Water System Revenue Bond Surcharge (c)	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total	Capital Costs	Water System Revenue Bond Surcharge (c)	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
<b>NBA</b>												
1	44.80	20.43	17.29	2.49	1.53	86.54	44.80	20.43	17.29	2.49	1.53	86.54
2	47.68	21.74	7.56	0.00	0.00	76.98	92.48	42.17	24.85	2.49	1.53	163.52
3A	8.50	3.88	15.03	5.10	2.47	34.98	100.98	46.05	39.88	7.59	4.00	198.50
3B	54.67	24.93	33.98	3.77	5.48	122.83	147.15	67.10	58.83	6.26	7.01	286.35
<b>SBA</b>												
1	7.83	3.57	20.27	5.58	5.72	42.97	10.02	4.57	24.26	8.31	8.39	55.55
2	0.74	0.34	2.29	0.00	0.00	3.37	10.76	4.91	26.55	8.31	8.39	58.92
4	2.46	1.12	3.90	0.00	0.00	7.48	13.22	6.03	30.45	8.31	8.39	66.40
5	5.17	2.36	3.06	0.00	0.00	10.59	18.39	8.39	33.51	8.31	8.39	76.99
6	0.30	0.14	0.32	0.00	0.00	0.76	18.69	8.53	33.83	8.31	8.39	77.75
7	2.29	1.04	0.59	0.00	0.00	3.92	20.98	9.57	34.42	8.31	8.39	81.67
8	3.11	1.42	0.98	0.00	0.00	5.51	24.09	10.99	35.40	8.31	8.39	87.18
9	6.42	2.93	3.68	0.00	0.00	13.03	30.51	13.92	39.08	8.31	8.39	100.21
<b>CA</b>												
1	2.19	1.00	3.99	2.73	2.67	12.58	2.19	1.00	3.99	2.73	2.67	12.58
2A	1.39	0.63	0.79	0.00	0.00	2.81	3.58	1.63	4.78	2.73	2.67	15.39
2B	0.71	0.32	0.39	0.00	0.00	1.42	4.29	1.95	5.17	2.73	2.67	16.81
3	0.62	0.28	0.29	0.00	0.00	1.19	4.91	2.23	5.46	2.73	2.67	18.00
4	0.99	0.45	1.98	1.30	1.21	5.93	5.90	2.68	7.44	4.03	3.88	23.93
5	0.76	0.35	0.39	0.00	0.00	1.50	6.66	3.03	7.83	4.03	3.88	25.43
6	0.20	0.09	0.20	0.00	0.00	0.49	6.86	3.12	8.03	4.03	3.88	25.92
7	1.14	0.52	0.48	0.00	0.00	2.14	8.00	3.64	8.51	4.03	3.88	28.06
8C	0.02	0.01	0.08	0.00	0.00	0.11	8.02	3.65	8.59	4.03	3.88	28.17
8D	0.44	0.20	0.38	0.00	0.00	1.02	8.46	3.85	8.97	4.03	3.88	29.19
9	0.37	0.17	0.35	0.00	0.00	0.89	8.83	4.02	9.32	4.03	3.88	30.08
10A	0.39	0.18	0.46	0.00	0.00	1.03	9.22	4.20	9.78	4.03	3.88	31.11
11B	0.58	0.26	0.29	0.00	0.00	1.13	9.80	4.46	10.07	4.03	3.88	32.24
12D	0.54	0.25	0.27	0.00	0.00	1.06	10.34	4.71	10.34	4.03	3.88	33.30
12E	0.38	0.17	0.45	0.00	0.00	1.00	10.72	4.88	10.79	4.03	3.88	34.30
13B	0.82	0.37	0.52	0.00	0.00	1.71	11.54	5.25	11.31	4.03	3.88	36.01
14A	3.15	1.44	4.00	2.29	2.27	13.15	14.69	6.69	15.31	6.32	6.15	49.16
14B	0.50	0.23	0.49	0.00	0.00	1.22	15.19	6.92	15.80	6.32	6.15	50.38
14C	0.41	0.19	0.37	0.00	0.00	0.97	15.60	7.11	16.17	6.32	6.15	51.35
15A	2.34	1.07	4.17	2.79	2.47	12.84	17.94	8.18	20.34	9.11	8.62	64.19
16A	3.87	1.76	6.46	6.05	5.76	23.90	21.81	9.94	26.80	15.16	14.38	88.09
17E	13.06	5.96	18.15	21.17	21.28	79.62	34.87	15.90	44.95	36.33	35.66	167.71
17F	3.38	1.54	0.22	0.00	0.00	5.14	38.25	17.44	45.17	36.33	35.66	172.85
18A	3.04	1.39	2.18	0.00	-2.24	4.37	41.29	18.83	47.35	36.33	33.42	177.22
19	2.25	1.03	1.32	0.00	0.00	4.60	43.54	19.86	48.67	36.33	33.42	181.82
19C	2.44	1.11	0.00	0.00	0.00	3.55	45.98	20.97	48.67	36.33	33.42	185.37
20A	1.78	0.81	2.18	0.00	0.00	4.77	47.76	21.78	50.85	36.33	33.42	190.14
20B	2.16	0.98	1.43	0.00	0.00	4.57	49.92	22.76	52.28	0.00	33.42	158.38
21	1.09	0.50	1.00	0.00	0.00	2.59	51.01	23.26	53.28	0.00	33.42	160.97
22A	1.14	0.52	0.52	0.00	0.00	2.18	52.15	23.78	53.80	0.00	33.42	163.15
22B	11.19	5.10	14.05	6.43	7.02	43.79	63.34	28.88	67.85	6.43	40.44	206.94
23	3.07	1.40	0.97	0.00	-2.85	2.59	66.41	30.28	68.82	6.43	37.59	209.53
24	5.96	2.72	2.72	0.00	0.00	11.40	72.37	33.00	71.54	6.43	37.59	220.93
25	4.35	1.98	0.15	0.00	0.00	6.48	76.72	34.98	71.69	6.43	37.59	227.41
26A	4.76	2.17	9.10	0.00	-19.46	(3.43)	81.48	37.15	80.79	6.43	18.13	223.98
28G	8.85	4.04	3.44	0.00	0.00	16.33	90.33	41.19	84.23	6.43	18.13	240.31
28H	8.52	3.88	3.61	0.00	0.00	16.01	98.85	45.07	87.84	6.43	18.13	256.32
28J	95.57	43.58	50.19	0.00	0.00	189.34	194.42	88.65	138.03	6.43	18.13	445.66
<b>EBX</b>												
1	N/A	0.00	0.22	0.00	0.00	0.22	N/A	37.15	81.01	6.43	18.13	142.72
2A	N/A	0.00	1.56	0.00	0.00	1.56	N/A	37.15	82.56	6.43	18.13	144.27
2B	N/A	0.00	66.59	7.80	31.93	106.32	N/A	37.15	149.15	14.23	50.06	250.59
2C	N/A	0.00	4.81	0.00	0.00	4.81	N/A	37.15	153.96	14.23	50.06	255.40
2D	N/A	0.00	0.00	0.00	0.00	0.00	N/A	37.15	153.96	14.23	50.06	255.40
2E	N/A	0.00	0.00	0.00	0.00	0.00	N/A	37.15	153.96	14.23	50.06	255.40
3A	N/A	0.00	121.57	9.35	42.20	173.12	N/A	37.15	275.53	23.58	92.26	428.52
3B	N/A	0.00	2.67	0.00	0.00	2.67	N/A	37.15	278.20	23.58	92.26	431.19
4A	N/A	0.00	6.94	0.00	0.00	6.94	N/A	37.15	285.14	23.58	92.26	438.13
4B	N/A	0.00	46.68	1.10	10.78	58.56	N/A	37.15	331.82	24.68	103.04	496.69
<b>WB</b>												
29A	4.43	2.02	10.42	2.77	2.50	22.14	42.68	19.46	55.59	39.10	38.16	194.99
29F	3.24	1.48	1.25	0.00	0.00	5.97	45.92	20.94	56.84	39.10	38.16	200.96
29G	10.74	4.90	5.93	0.00	-9.00	12.57	56.66	25.84	62.77	39.10	29.16	213.53
29H	6.69	3.05	5.62	0.00	0.00	15.36	63.35	28.89	68.39	39.10	29.16	228.89
29J	11.21	5.11	1.62	0.00	-16.83	1.11	74.56	34.00	70.01	39.10	12.33	230.00
30	18.00	8.21	5.04	0.00	0.00	31.25	92.56	42.21	75.05	39.10	12.33	261.25
<b>CB</b>												
31A	8.14	3.71	23.79	2.10	2.15	39.89	16.60	7.56	32.76	6.13	6.03	69.08
33A	304.16	138.69	44.88	14.64	28.11	530.48	320.76	146.25	77.64	20.77	34.14	599.56
34	217.32	99.09	1.25	0.00	0.00	317.66	538.08	245.34	78.89	20.77	34.14	917.22
35	0.00	0.00	0.00	0.00	0.00	0.00	538.08	245.34	78.89	20.77	34.14	917.22

(a) Representative of transportation unit costs only; does not include a unit cost of conservation. The Delta Water Rate should be added to these values in order to approximate unit costs at canal side. Includes surplus water prior to May 1, 1973.

(b) Hypothetical charges which, if assessed on all Table A water delivered to date, all surplus water delivered prior to May 1, 1973, and all Table A water estimated to be delivered during the remainder of the Project repayment period (Table B-5B), would provide a sum at the end of the period financially equivalent to all Transportation Charges required under the water supply contract considering interest rate at the Project Interest Rate of 4.610 percent per annum.

(c) The Water System Revenue Bond Surcharge equivalent unit rate is calculated by multiplying Column 1 by the ratio of the 2015 WSRB surcharge to the sum of the Transportation Capital and the Capital component of the Delta Water Charge.

**TABLE B-26 Capital Costs of Each Aqueduct Reach  
to be Reimbursed through the Capital Cost Component  
of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 1 of 2

Calendar Year	CALIFORNIA AQUEDUCT							
	MOJAVE DIVISION							
	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23B
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1952	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	117,000	0	0	0	0	0	0	0
1980	200,000	0	0	0	0	0	0	74,000
1981	135,000	0	0	0	0	0	0	385,000
1982	1,503,000	0	0	0	0	0	0	1,586,000
1983	2,260,000	0	0	0	0	0	0	2,965,000
1984	735,000	0	0	0	0	0	796,000	1,380,000
1985	93,000	435,000	75,000	544,000	859,000	703,000	970,000	146,000
1986	784,000	4,477,000	3,144,000	2,234,000	1,569,000	1,203,000	1,808,000	34,000
1987	11,000	951,000	1,076,000	666,000	399,000	47,000	16,421,000	43,000
1988	1,000	125,000	1,681,000	1,730,000	2,024,000	40,000	13,326,000	70,000
1989	0	206,000	2,089,000	2,174,000	2,510,000	61,000	11,242,000	229,000
1990	1,000	577,000	903,000	735,000	928,000	194,000	20,131,000	887,000
1991	1,000	280,000	413,000	333,000	422,000	93,000	20,702,000	1,215,000
1992	0	40,000	41,000	39,000	35,000	13,000	9,599,000	3,719,000
1993	0	19,000	16,000	19,000	12,000	6,000	2,319,000	19,654,000
1994	0	2,000	3,000	2,000	4,000	3,000	803,000	3,173,000
1995	0	0	0	0	0	0	223,000	1,465,000
1996	0	0	0	0	0	0	6,014,000	478,000
1997	0	0	0	0	0	0	404,000	1,327,000
1998	0	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>5,841,000</b>	<b>7,112,000</b>	<b>9,441,000</b>	<b>8,476,000</b>	<b>8,762,000</b>	<b>2,363,000</b>	<b>104,758,000</b>	<b>38,830,000</b>

**TABLE B-26 Capital Costs of Each Aqueduct Reach  
to be Reimbursed through the Capital Cost Component  
of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							GRAND TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Total	Reach 25	Reach 26A	Reach 26B	Total	
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
1952	0	0	0	0	0	0	0	0
1953	0	0	0	0	0	0	0	0
1954	0	0	0	0	0	0	0	0
1955	0	0	0	0	0	0	0	0
1956	0	0	0	0	0	0	0	0
1957	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0
1959	0	0	0	0	0	0	0	0
1960	0	0	0	0	0	0	0	0
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	0
1963	0	0	0	0	0	0	0	0
1964	0	0	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0
1966	0	0	0	0	0	0	0	0
1967	0	0	0	0	0	0	0	0
1968	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	117,000	0	0	0	0	117,000
1980	0	0	274,000	0	0	0	0	274,000
1981	0	0	520,000	0	0	0	0	520,000
1982	0	0	3,089,000	0	0	0	0	3,089,000
1983	0	0	5,225,000	0	0	0	0	5,225,000
1984	0	0	2,911,000	0	0	0	0	2,911,000
1985	0	0	3,825,000	0	528,000	89,000	617,000	4,442,000
1986	25,000	0	15,278,000	0	1,926,000	154,000	2,080,000	17,358,000
1987	178,000	0	19,792,000	0	3,699,000	437,000	4,136,000	23,928,000
1988	632,000	0	19,629,000	0	5,667,000	3,329,000	8,996,000	28,625,000
1989	1,130,000	0	19,641,000	0	40,879,000	1,650,000	42,529,000	62,170,000
1990	2,066,000	0	26,422,000	0	29,853,000	1,650,000	31,503,000	57,925,000
1991	4,980,000	0	28,439,000	0	26,027,000	999,000	27,026,000	55,465,000
1992	11,920,000	0	25,406,000	0	15,317,000	299,000	15,616,000	41,022,000
1993	16,303,000	0	38,348,000	0	4,878,000	0	4,878,000	43,226,000
1994	7,081,000	0	11,071,000	0	3,151,000	0	3,151,000	14,222,000
1995	5,350,000	0	7,038,000	0	2,137,000	0	2,137,000	9,175,000
1996	1,706,000	0	8,198,000	0	9,181,000	0	9,181,000	17,379,000
1997	1,905,000	0	3,636,000	0	175,000	0	175,000	3,811,000
1998	28,000	0	28,000	0	0	0	0	28,000
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>53,304,000</b>	<b>0</b>	<b>238,887,000</b>	<b>0</b>	<b>143,418,000</b>	<b>8,607,000</b>	<b>152,025,000</b>	<b>390,912,000</b>

**TABLE B-27 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 1 of 2

Calendar Year	CALIFORNIA AQUEDUCT							
	MOJAVE DIVISION							
	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A	Reach 22B	Reach 23B
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	1,048,625	0
1995	0	0	0	0	0	0	953,814	0
1996	0	0	0	0	0	0	1,171,411	0
1997	0	0	0	0	0	0	1,110,038	0
1998	0	0	0	0	0	0	1,213,002	0
1999	1,229	517	646	409	383	169	668,466	0
2000	4,452	1,875	2,340	1,484	1,386	614	1,315,186	0
2001	347	146	183	116	108	48	1,029,962	0
2002	1,639	690	861	546	510	226	1,535,510	0
2003	0	0	0	0	0	0	1,816,604	0
2004	2,132	27,868	18,579	18,731	10,355	8,528	1,476,572	0
2005	1,243	16,250	10,833	10,922	6,038	4,973	1,034,832	0
2006	4,632	60,550	40,367	40,697	22,499	18,529	1,492,093	0
2007	13,123	171,531	114,354	115,291	63,738	52,490	1,826,451	0
2008	28,340	370,451	246,967	248,992	137,654	113,362	2,955,615	0
2009	37,593	491,395	327,597	330,282	182,595	150,372	2,894,790	0
2010	8,932	116,755	77,837	78,475	43,385	35,728	2,092,875	0
2011	6,959	90,964	60,643	61,140	33,801	27,836	2,123,113	0
2012	11,090	144,958	96,639	97,431	53,864	44,359	2,288,890	0
2013	293	3,828	2,552	2,573	1,422	1,171	2,133,197	0
2014	0	0	0	0	0	0	2,627,068	0
<b>2015</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,635,155</b>	<b>0</b>
2016	0	0	0	0	0	0	2,747,382	0
2017	0	0	0	0	0	0	2,747,382	0
2018	0	0	0	0	0	0	2,747,382	0
2019	0	0	0	0	0	0	2,747,382	0
2020	0	0	0	0	0	0	2,747,382	0
2021	0	0	0	0	0	0	2,747,382	0
2022	0	0	0	0	0	0	2,747,382	0
2023	0	0	0	0	0	0	2,747,382	0
2024	0	0	0	0	0	0	2,747,382	0
2025	0	0	0	0	0	0	2,747,382	0
2026	0	0	0	0	0	0	2,747,382	0
2027	0	0	0	0	0	0	2,747,382	0
2028	0	0	0	0	0	0	2,747,382	0
2029	0	0	0	0	0	0	2,747,382	0
2030	0	0	0	0	0	0	2,747,382	0
2031	0	0	0	0	0	0	2,747,382	0
2032	0	0	0	0	0	0	2,747,382	0
2033	0	0	0	0	0	0	2,747,382	0
2034	0	0	0	0	0	0	2,747,382	0
2035	0	0	0	0	0	0	2,747,382	0
<b>TOTAL</b>	<b>122,004</b>	<b>1,497,780</b>	<b>1,000,397</b>	<b>1,007,089</b>	<b>557,740</b>	<b>458,406</b>	<b>92,390,910</b>	<b>0</b>



**TABLE B-27 Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of the East Branch Enlargement Transportation Charge**

(in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Subtotal	Reach 25	Reach 26A (a)	Reach 26B	Subtotal	
[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	1,048,625	0	1,713,260	0	1,713,260	2,761,885
1995	0	0	953,814	0	1,452,549	0	1,452,549	2,406,363
1996	0	0	1,171,411	0	1,350,581	0	1,350,581	2,521,992
1997	679,826	0	1,789,864	0	1,528,509	0	1,528,509	3,318,373
1998	825,038	0	2,038,040	0	1,619,068	0	1,619,068	3,657,108
1999	382,178	0	1,053,997	0	956,229	0	956,229	2,010,227
2000	735,389	0	2,062,727	0	1,408,811	0	1,408,811	3,471,538
2001	812,061	0	1,842,972	0	792,074	0	792,074	2,635,045
2002	727,301	0	2,267,283	0	1,135,218	0	1,135,218	3,402,501
2003	899,762	0	2,716,366	0	1,240,911	0	1,240,911	3,957,277
2004	913,700	0	2,476,465	0	1,809,888	0	1,809,888	4,286,353
2005	1,036,879	0	2,121,970	0	1,857,673	0	1,857,673	3,979,643
2006	831,418	0	2,510,786	0	1,722,356	0	1,722,356	4,233,142
2007	1,319,751	0	3,676,729	0	2,803,089	0	2,803,089	6,479,818
2008	1,081,391	0	5,182,773	0	2,724,767	0	2,724,767	7,907,540
2009	1,542,670	0	5,957,294	0	2,841,336	0	2,841,336	8,798,631
2010	1,454,474	0	3,908,462	0	2,425,478	0	2,425,478	6,333,940
2011	1,825,553	0	4,230,008	0	2,108,340	0	2,108,340	6,338,348
2012	1,284,203	0	4,021,433	0	2,334,534	0	2,334,534	6,355,968
2013	1,623,709	0	3,768,746	0	2,937,820	0	2,937,820	6,706,566
2014	1,773,422	0	4,400,490	0	3,557,222	0	3,557,222	7,957,712
<b>2015</b>	<b>2,001,671</b>	<b>0</b>	<b>4,636,826</b>	<b>0</b>	<b>3,327,125</b>	<b>0</b>	<b>3,327,125</b>	<b>7,963,951</b>
2016	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2017	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2018	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2019	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2020	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2021	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2022	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2023	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2024	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2025	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2026	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2027	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2028	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2029	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2030	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2031	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2032	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2033	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2034	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
2035	2,094,159	0	4,841,541	0	3,480,336	0	3,480,336	8,321,877
<b>TOTAL</b>	<b>63,633,576</b>	<b>0</b>	<b>160,667,903</b>	<b>0</b>	<b>113,253,558</b>	<b>0</b>	<b>113,253,558</b>	<b>273,921,461</b>

(a) Units 3 and 4 at Devil Canyon Powerplant were operational in 1993.

**TABLE B-28 Capital Costs of East Branch Enlargement  
Transportation Facilities Allocated to Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley- East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	11,731	1,010	10,566	466	0	93,227	117,000
1980	0	28,241	4,708	27,495	797	0	212,759	274,000
1981	0	56,134	16,676	61,271	538	0	385,381	520,000
1982	0	326,180	76,872	337,913	5,988	0	2,342,047	3,089,000
1983	0	554,658	138,964	582,070	9,004	0	3,940,304	5,225,000
1984	0	306,514	68,842	314,468	2,928	0	2,218,248	2,911,000
1985	49,675	447,266	65,773	347,262	4,514	21,614	3,505,896	4,442,000
1986	185,353	1,757,633	236,324	1,363,586	41,900	78,842	13,694,362	17,358,000
1987	49,735	2,455,279	378,535	1,774,447	10,615	151,421	19,107,968	23,928,000
1988	124,534	2,689,959	500,466	1,712,431	13,783	231,982	23,351,845	28,625,000
1989	155,446	7,118,094	2,423,000	1,671,088	17,419	1,673,409	49,111,544	62,170,000
1990	62,786	6,459,229	1,943,918	2,234,452	8,680	1,222,053	45,993,882	57,925,000
1991	28,686	6,265,822	1,875,066	2,168,712	4,024	1,065,433	44,057,257	55,465,000
1992	2,911	4,826,764	1,610,921	1,359,335	471	627,012	32,594,586	41,022,000
1993	1,205	5,094,237	1,828,410	2,722,156	212	199,684	33,380,096	43,226,000
1994	273	1,726,376	631,816	478,543	27	128,988	11,255,977	14,222,000
1995	0	1,130,963	423,243	206,978	0	87,480	7,326,336	9,175,000
1996	0	2,025,987	645,296	606,205	0	375,830	13,725,682	17,379,000
1997	0	451,011	154,366	205,796	0	7,164	2,992,663	3,811,000
1998	0	3,551	1,293	0	0	0	23,156	28,000
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>660,604</b>	<b>43,735,629</b>	<b>13,025,499</b>	<b>18,184,774</b>	<b>121,366</b>	<b>5,870,912</b>	<b>309,313,216</b>	<b>390,912,000</b>

**TABLE B-29 Capital Cost Component of East Branch Enlargement  
Facilities Transportation Charge for Each Contractor <sup>a</sup>**  
(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley - East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District (b)	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	18,266	1,209,293	360,156	502,810	3,356	0	8,552,529	10,646,410
1989	19,176	1,269,524	378,094	527,854	3,523	0	8,978,504	11,176,675
1990	19,186	1,270,244	378,308	528,153	3,525	0	8,983,597	11,183,013
1991	19,187	1,270,261	378,314	528,160	3,525	0	8,983,717	11,183,164
1992	38,420	2,543,616	757,549	1,057,806	7,059	0	17,989,315	22,393,565
1993	40,029	2,650,139	789,274	1,101,897	7,354	0	18,742,682	23,331,375
1994	39,705	2,628,706	782,890	1,092,986	7,295	0	18,591,099	23,142,681
1995	39,632	2,623,828	781,438	1,090,958	7,281	0	18,556,603	23,099,740
1996	39,825	2,636,667	785,261	1,096,296	7,317	0	18,647,406	23,212,772
1997	41,743	2,763,629	823,074	1,149,085	7,669	0	19,545,322	24,330,522
1998	42,642	2,823,126	840,793	1,173,823	7,834	0	19,966,108	24,854,326
1999	44,738	2,961,887	882,120	1,231,519	8,219	0	20,947,475	26,075,958
2000	49,031	3,246,109	966,768	1,349,695	9,008	0	22,957,586	28,578,197
2001	49,048	3,247,263	967,111	1,350,175	9,011	0	22,965,748	28,588,356
2002	47,894	3,170,848	944,353	1,318,402	8,799	0	22,425,318	27,915,614
2003	40,765	2,698,871	803,787	1,122,160	7,489	0	19,087,337	23,760,409
2004	44,199	2,926,222	871,498	1,216,690	8,120	0	20,695,237	25,761,966
2005	33,144	2,194,299	653,514	912,364	6,089	0	15,518,826	19,318,236
2006	46,979	3,110,276	926,313	1,293,217	8,631	0	21,996,926	27,382,342
2007	45,289	2,998,370	892,985	1,246,688	8,321	0	21,205,488	26,397,141
2008	42,491	2,813,118	837,813	1,169,662	7,806	0	19,895,328	24,766,218
2009	43,670	2,891,182	861,062	1,202,121	8,023	0	20,447,424	25,453,482
2010	44,839	2,968,619	884,125	1,234,318	8,238	0	20,995,084	26,135,223
2011	43,190	2,859,419	851,602	1,188,914	7,935	0	20,222,785	25,173,845
2012	43,704	2,893,449	861,737	1,203,063	8,029	0	20,463,459	25,473,441
2013	37,663	2,493,469	742,614	1,036,756	6,919	0	17,634,660	21,952,081
2014	58,891	3,966,057	1,190,060	1,621,132	10,820	0	27,991,931	34,838,891
<b>2015</b>	<b>63,827</b>	<b>4,297,808</b>	<b>1,289,527</b>	<b>1,756,983</b>	<b>11,726</b>	<b>0</b>	<b>30,333,900</b>	<b>37,753,771</b>
2016	62,768	4,219,223	1,264,999	1,727,844	11,532	0	29,785,380	37,071,746
2017	64,997	4,374,225	1,312,149	1,789,185	11,941	0	30,875,227	38,427,724
2018	63,444	4,272,075	1,281,806	1,746,464	11,657	0	30,152,278	37,527,724
2019	63,623	4,287,644	1,286,941	1,751,371	11,689	0	30,259,167	37,660,435
2020	62,429	4,194,317	1,257,248	1,718,536	11,470	0	29,611,399	36,855,399
2021	63,783	4,291,817	1,287,332	1,755,786	11,718	0	30,294,185	37,704,621
2022	61,353	4,129,778	1,238,926	1,688,876	11,272	0	29,149,142	36,279,347
2023	50,454	3,405,483	1,022,851	1,388,861	9,269	0	24,029,022	29,905,940
2024	53,079	3,579,867	1,074,860	1,461,138	9,752	0	25,261,855	31,440,551
2025	60,364	4,062,905	1,218,820	1,661,667	11,090	0	28,677,418	35,692,264
2026	23,728	1,619,020	488,537	653,188	4,360	0	11,409,180	14,198,013
2027	24,165	1,650,561	498,274	665,222	4,440	0	11,630,028	14,472,690
2028	15,568	1,068,968	323,423	428,553	2,860	0	7,527,397	9,366,769
2029	16,320	1,121,368	339,368	449,277	2,998	0	7,895,807	9,825,138
2030	0	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>1,823,248</b>	<b>121,703,550</b>	<b>36,377,674</b>	<b>50,189,455</b>	<b>334,969</b>	<b>0</b>	<b>859,878,879</b>	<b>1,070,307,775</b>

(a) 1988 through 2013 charges are debt service only and do not include bond cover, 2014 charges and after include both debt service and bond cover.

(b) Under Article 49(d)(4)(A) of its contract, San Bernardino Valley Municipal Water District elected to pay a portion of its allocated costs of East Branch Enlargement in advance rather than to participate in payment of Water System Revenue Bonds. This election made via a letter of agreement signed June 1, 1987. As of June 1999, \$6,347,938 has been received from the San Bernardino Valley Municipal Water District.

**TABLE B-30 Minimum OMP&R Component of East Branch Enlargement Facilities Transportation Charge for Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley-East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	320,415	101,486	95,075	0	70,133	2,174,776	2,761,885
1995	0	278,176	86,604	86,479	0	59,461	1,895,643	2,406,363
1996	0	287,293	82,991	106,208	0	55,287	1,990,213	2,521,992
1997	0	389,636	123,446	100,643	0	62,571	2,642,077	3,318,373
1998	0	429,772	135,927	109,979	0	66,278	2,915,152	3,657,108
1999	37	236,006	75,040	60,907	11	39,144	1,599,082	2,010,227
2000	132	403,529	121,437	120,330	40	57,671	2,768,399	3,471,538
2001	10	306,085	89,149	93,468	3	32,424	2,113,906	2,635,045
2002	49	389,610	108,153	139,619	15	46,471	2,718,584	3,402,501
2003	0	452,587	124,214	164,705	0	50,798	3,164,973	3,957,277
2004	1,278	500,000	153,330	141,551	265	74,089	3,415,840	4,286,353
2005	745	473,591	157,461	98,300	154	76,045	3,173,347	3,979,643
2006	2,777	490,144	145,805	151,959	575	70,506	3,371,376	4,233,142
2007	7,866	755,194	232,458	212,838	1,630	114,746	5,155,086	6,479,818
2008	16,988	889,641	232,251	369,999	3,520	111,540	6,283,601	7,907,540
2009	22,534	993,613	262,494	397,793	4,669	116,312	7,001,216	8,798,631
2010	5,354	734,994	219,181	221,909	1,109	99,289	5,052,104	6,333,940
2011	4,171	737,437	218,795	217,547	864	86,306	5,073,228	6,338,348
2012	6,647	730,354	208,855	247,448	1,377	95,566	5,065,721	6,355,968
2013	176	790,234	252,003	194,464	36	120,262	5,349,391	6,706,566
2014	0	935,442	296,501	238,188	0	145,617	6,341,964	7,957,712
<b>2015</b>	<b>0</b>	<b>936,344</b>	<b>294,701</b>	<b>238,921</b>	<b>0</b>	<b>136,198</b>	<b>6,357,787</b>	<b>7,963,951</b>
2016	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2017	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2018	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2019	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2020	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2021	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2022	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2023	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2024	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2025	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2026	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2027	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2028	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2029	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2030	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2031	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2032	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2033	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2034	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2035	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
<b>TOTAL</b>	<b>68,764</b>	<b>32,031,777</b>	<b>9,886,422</b>	<b>8,790,250</b>	<b>14,268</b>	<b>4,636,114</b>	<b>218,493,866</b>	<b>273,921,461</b>

**TABLE B-31 Total East Branch Enlargement Facilities  
Transportation Charge for Each Contractor**

(in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	Antelope Valley- East Kern Water Agency	Coachella Valley Water District	Desert Water Agency	Mojave Water Agency	Palmdale Water District	San Bernardino Valley Municipal Water District	The Metropolitan Water District of Southern California	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
1971	0	0	0	0	0	0	0	0
1972	0	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0	0
1974	0	0	0	0	0	0	0	0
1975	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0
1983	0	0	0	0	0	0	0	0
1984	0	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0	0
1988	18,266	1,209,293	360,156	502,810	3,356	0	8,552,529	10,646,410
1989	19,176	1,269,524	378,094	527,854	3,523	0	8,978,504	11,176,675
1990	19,186	1,270,244	378,308	528,153	3,525	0	8,983,597	11,183,013
1991	19,187	1,270,261	378,314	528,160	3,525	0	8,983,717	11,183,164
1992	38,420	2,543,616	757,549	1,057,606	7,059	0	17,989,315	22,393,565
1993	40,029	2,650,139	789,274	1,101,897	7,354	0	18,742,682	23,331,375
1994	39,705	2,949,121	884,376	1,188,061	7,295	70,133	20,765,875	25,904,566
1995	39,632	2,902,004	868,042	1,177,437	7,281	59,461	20,452,246	25,506,103
1996	39,825	2,923,960	868,252	1,202,504	7,317	55,287	20,637,619	25,734,764
1997	41,743	3,153,265	946,520	1,249,728	7,669	62,571	22,187,399	27,648,895
1998	42,642	3,252,898	976,720	1,283,802	7,834	66,278	22,881,260	28,511,434
1999	44,775	3,197,893	957,160	1,292,426	8,230	39,144	22,546,557	28,086,185
2000	49,163	3,649,638	1,088,205	1,470,025	9,048	57,671	25,725,985	32,049,735
2001	49,058	3,553,348	1,056,260	1,443,643	9,014	32,424	25,079,654	31,223,401
2002	47,943	3,560,458	1,052,506	1,458,021	8,814	46,471	25,143,902	31,318,115
2003	40,765	3,151,458	928,001	1,286,865	7,489	50,798	22,252,310	27,717,686
2004	45,477	3,426,222	1,024,828	1,358,241	8,385	74,089	24,111,077	30,048,319
2005	33,889	2,667,890	810,975	1,010,664	6,243	76,045	18,692,173	23,297,879
2006	49,756	3,600,420	1,072,118	1,445,176	9,206	70,506	25,368,302	31,615,484
2007	53,155	3,753,564	1,125,443	1,459,526	9,951	114,746	26,360,574	32,876,959
2008	59,479	3,702,759	1,070,064	1,539,661	11,326	111,540	26,178,929	32,673,758
2009	66,204	3,884,795	1,123,556	1,599,914	12,692	116,312	27,448,640	34,252,113
2010	50,193	3,703,613	1,103,306	1,456,227	9,347	99,289	26,047,188	32,469,163
2011	47,361	3,596,856	1,070,397	1,406,461	8,799	86,306	25,296,013	31,512,193
2012	50,351	3,623,803	1,070,592	1,450,511	9,406	95,566	25,529,180	31,829,409
2013	37,839	3,283,703	994,617	1,231,220	6,955	120,262	22,984,051	28,658,647
2014	58,891	4,901,499	1,486,561	1,859,320	10,820	145,617	34,333,895	42,796,603
<b>2015</b>	<b>63,827</b>	<b>5,234,152</b>	<b>1,584,228</b>	<b>1,995,904</b>	<b>11,726</b>	<b>136,198</b>	<b>36,691,687</b>	<b>45,717,722</b>
2016	62,768	5,197,807	1,573,206	1,976,940	11,532	142,470	36,428,900	45,393,623
2017	64,997	5,352,809	1,620,356	2,038,281	11,941	142,470	37,518,747	46,749,601
2018	63,444	5,250,659	1,590,013	1,995,560	11,657	142,470	36,795,798	45,849,601
2019	63,623	5,266,228	1,595,148	2,000,467	11,689	142,470	36,902,687	45,982,312
2020	62,429	5,172,901	1,565,455	1,967,632	11,470	142,470	36,254,919	45,177,276
2021	63,783	5,270,401	1,595,539	2,004,882	11,718	142,470	36,937,705	46,026,498
2022	61,353	5,108,362	1,547,133	1,937,972	11,272	142,470	35,792,662	44,601,224
2023	50,454	4,384,067	1,331,058	1,637,957	9,269	142,470	30,672,542	38,227,817
2024	53,079	4,558,451	1,383,067	1,710,234	9,752	142,470	31,905,375	39,762,428
2025	60,364	5,041,489	1,527,027	1,910,763	11,090	142,470	35,320,938	44,014,141
2026	23,728	2,597,604	796,744	902,284	4,360	142,470	18,052,700	22,519,890
2027	24,165	2,629,145	806,481	914,318	4,440	142,470	18,273,548	22,794,567
2028	15,568	2,047,552	631,630	677,649	2,860	142,470	14,170,917	17,688,646
2029	16,320	2,099,952	647,575	698,373	2,998	142,470	14,539,327	18,147,015
2030	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2031	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2032	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2033	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2034	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
2035	0	978,584	308,207	249,096	0	142,470	6,643,520	8,321,877
<b>TOTAL</b>	<b>1,892,012</b>	<b>153,735,327</b>	<b>46,264,096</b>	<b>58,979,705</b>	<b>349,237</b>	<b>4,636,114</b>	<b>1,078,372,745</b>	<b>1,344,229,236</b>

## CONVERSION FACTORS

Quantity	To convert from customary unit	To metric units	Multiply customary unit by	To convert to customary unit, multiply metric unit by
Length	inches (in)	millimeters (mm)●	25.4	0.03937
	inches (in)	centimeters (cm)	2.54	0.3937
	feet (ft)	meters (m)	0.3048	3.2808
	miles (mi)	kilometers (km)	1.6093	0.62139
Area	square inches (in <sup>2</sup> )	square millimeters (mm <sup>2</sup> )	645.16	0.00155
	square feet (ft <sup>2</sup> )	square meters (m <sup>2</sup> )	0.092903	10.764
	acres (ac)	hectares (ha)	0.40469	2.4710
	square miles (mi <sup>2</sup> )	square kilometers (km <sup>2</sup> )	2.590	0.3861
Volume	gallons (gal)	liters (L)	3.7854	0.26417
	million gallons (10 <sup>6</sup> gal)	megaliters (ML)	3.7854	0.26417
	cubic feet (ft <sup>3</sup> )	cubic meters (m <sup>3</sup> )	0.028317	35.315
	cubic yards (yd <sup>3</sup> )	cubic meters (m <sup>3</sup> )	0.76455	1.308
	acre-feet (af)	thousand cubic meters (m <sup>3</sup> x 10 <sup>3</sup> )	1.2335	0.8107
	acre-feet (af)	hectare-meters (ha - m)■	0.1234	8.107
	thousand acre-feet (taf)	million cubic meters (m <sup>3</sup> x 10 <sup>6</sup> )	1.2335	0.8107
	thousand acre-feet (taf)	hectare-meters (ha - m)■	123.35	0.008107
	million acre-feet (maf)	billion cubic meters (m <sup>3</sup> x 10 <sup>9</sup> )◆	1.2335	0.8107
	million acre-feet (maf)	cubic kilometers (km <sup>3</sup> )	1.2335	0.8107
Flow	cubic feet per second (ft <sup>3</sup> /s)	cubic meters per second (m <sup>3</sup> /s)	0.028317	35.315
	gallons per minute (gal/min)	liters per minute (L/min)	3.7854	0.26417
	gallons per day (gal/day)	liters per day (L/day)	3.7854	0.26417
	million gallons per day (mgd)	megaliters per day (ML/day)	3.7854	0.26417
	acre-feet per day (af/day)	thousand cubic meters per day (m <sup>3</sup> x 10 <sup>3</sup> /day)	1.2335	0.8107
Mass	pounds (lb)	kilograms (kg)	0.45359	2.2046
	tons (short, 2,000 lb)	megagrams (Mg)	0.90718	1.1023
Velocity	feet per second (ft/s)	meters per second (m/s)	0.3048	3.2808
Power	horsepower (hp)	kilowatts (kW)	0.746	1.3405
Pressure	pounds per square inch (psi)	kilopascals (kPa)	6.8948	0.14505
	feet head of water	kilopascals (kPa)	2.989	0.32456
Specific capacity	gallons per minute per foot of drawdown	liters per minute per meter of drawdown	12.419	0.08052
Concentration	parts per million (ppm)	milligrams per liter (mg/L)	1.0	1.0
Electrical conductivity	micromhos per centimeter (μmhos/cm)	microsiemens per centimeter (μS/cm)	1.0	1.0
Temperature	degrees Fahrenheit (°F)	degrees Celsius (°C)	(°F - 32)/1.8	(1.8 x °C) + 32

● When using "dual units," inches are normally converted to millimeters (rather than centimeters).

■ Not used often in metric countries, but is offered as a conceptual equivalent of customary western U.S. practice (a standard depth of water over a given area of land).

◆ ASTM Manual E380 discourages the use of billion cubic meters since that magnitude is represented by giga (a thousand million) in other countries. It is shown here for potential use for quantifying large reservoir volumes (similar to million acre-feet).

### OTHER COMMON CONVERSION FACTORS

1 cubic foot=7.48 gallons=62.4 pounds of water

1 cubic foot per second (cfs)=450 gallons per minute (gpm)

1 cfs=646,320 gallons per day=1.98 af a day

1 acre-foot=approximately 325,851 gallons=43,560 cubic feet

1 million gallons=3.07 acre-feet

1 million gallons per day (mgd)=1,120 af a year





STATE OF CALIFORNIA  
CALIFORNIA NATURAL RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES

