

## State Water Resources Control Board

Division of Drinking Water

May 31, 2017

Heather Collins, P.E.  
Water Treatment Section Manager  
Metropolitan Water District of Southern CA  
PO Box 54153  
Los Angeles, CA 90054

Dear Ms. Collins,

Subject: Review of MWDs MBR LRV Acceptance Proposal (1990026-700)

The Division of Drinking Water's (DDW) Recycled Water Unit has reviewed a request, dated April 19, 2017, from Metropolitan Water District of Southern California (MWD) to comment on proposed testing approaches that would allow DDW to grant Log Removal Value (LRV) credits to Membrane Bioreactor (MBR) and Reverse Osmosis (RO) treatment processes. Accompanying the request was a report entitled, "Advanced Water Treatment Demonstration Facility Testing Strategy", dated April 18, 2017. The report outlines the proposed testing to be done at a 0.5 MGD demonstration-scale facility. This facility will treat non-nitrified secondary effluent from the Joint Water Pollution Control Plant through an MBR-RO-UV/AOP treatment process that will be used as a supply for a future Indirect Potable Reuse Project.

The following are DDW comments.

1. DDW has extensive experience reviewing membrane performance for drinking water applications. Experience has shown that a membrane challenged after cleaning has lower LRVs than a more fouled membrane surface. However, MWD test results presented do not follow this well-known phenomenon. The data showed in many cases improved LRVs, which is counter-intuitive and not seen in other studies. Please explain these results.
2. Sampling results may be influenced by the time between the influent and effluent sample collection. The final test plan should consider the time it takes for the flow of water between the influent sample location and the effluent sample location. This would be more representative of actual removal.
3. DDW will accept the Australian MBR Validation Protocol, which includes three approaches (or 3 Tiers). DDW encourages collaboration with Australian WaterSecure to establish a consistent approach evaluating MBR LRVs.
4. DDW will accept the pathogen LRVs granted in the Australian Tier 1 MBR Validation Protocol, provided the MBR operates within the Protocol's Table 2 operating envelope. The critical control alarm set point that triggers diversion (or recycle to the head of the plant) must be at the upper turbidity limit of 0.2 NTU to receive the Tier 1 default LRV credits for pathogens.

5. If the Australian MBR Validation Protocol Tier 2 approach is used, be aware, it includes a commissioning step after installation.
6. DDW strongly encourages MWD to develop their MBR protocol in accordance with the Australian MBR Validation Protocol Tier 3 approach.
7. The MBR Validation Protocol, section 6.2.1. Pre-installation challenge testing states, "A minimum of five modular units should be tested in accordance with the Membrane Filtration Guidance Manual (USEPA 2005)." Alternatively, DDW has accepted testing conducted with two membrane cassettes (modules) if they are selected with conservative criteria (the most stringent QA/QC standards), such that they are at or exceed the Quality Control Release Value (QCRV). The USEPA manual section 3.6 states, "A NDPT is a physical test applied to the membrane module with the objective of characterizing some aspect of process performance and which does not alter or damage the membrane. The minimum passing test result for a NDPT is known as the quality control release value (QCRV)." After delivery to the test site, a Non Destructive Performance Testing (NDPT) should be performed on both. This would also verify that the cassette either fails or just barely meets the QCRV passing criteria. This should guarantee that any cassette supplied for the full-scale plant would perform better than the ones tested.
8. One of the MWD proposed surrogates is ATP. DDW is aware that there are two suppliers. One current research project has used both suppliers and found that the sampling data differ by an order of magnitude. Please comment on which supplier will be used and why they were chosen.
9. DDW has reviewed data from TRASAR testing in the past and does not foresee an issue with granting higher RO LRVs when using TRASAR. Include if TRASAR will be continuously monitored or if a surrogate will be proposed for continuous monitoring.
10. DDW looks forward to reviewing the draft Testing and Monitoring Plan that is scheduled to be presented in the fall of 2017.

If you have any questions regarding this letter, please contact Randy Barnard at (619) 525-4022 or via email at [Randy.Barnard@waterboards.ca.gov](mailto:Randy.Barnard@waterboards.ca.gov).

Sincerely,



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Recycled Water Unit Chief  
Recycled Water Unit  
Division of Drinking Water  
State Water Resources Control Board  
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