

CVCWA Toxicity Special Study

Background:

- Toxicity observed at POTWs has decreased in magnitude (e.g., survival to sub-lethal endpoints) and duration over the last several decades.
- When toxicity is observed for POTWs, it is often at a “low level” and can be intermittent, which can present challenges for current Toxicity Reduction Evaluation (TRE) protocols and result in significant expenditures.
- CVCWA Water Committee has been working with Regional Board staff on this issue since 2014.
- Central Valley Regional Board has included provisions in NPDES permits allowing POTWs to work together in a coordinated group effort to evaluate low level and intermittent toxicity through a Toxicity Evaluation Study.
- CVCWA contracted with consulting team of Larry Walker Associates (LWA), Pacific EcoRisk (PER), and Robertson Bryan (RBI) to address the issue through a Toxicity Special Study for Central Valley Wastewater Treatment Plants in May 2017.

Study Scope:

Phase I: Toxicity Testing Summary and Evaluation

Task 1: Characterize chronic toxicity test results in Central Valley POTWs

- Evaluate CIWQS data for frequency/magnitude of toxicity and wastewater treatment category
- Determine specific approaches used when toxicity was identified in routine monitoring
- Compile information on accelerated monitoring and TREs
- Develop a checklist for POTWs to use prior to triggering TIE
- Identify how often TIEs are utilized and their success in identifying toxicant
- Determine if there is a difference in toxicity frequency/magnitude between UV disinfection POTWs and non-UV disinfection POTWs

Task 2: Document variability in chronic bioassay test results for sub-lethal test endpoints

- Evaluate inter-laboratory studies
- Determine cases when laboratories obtained different results
- Determine factors that result in method variability
- Develop a screening checklist for POTWs to review toxicity reports

Task 3: Develop a tabulated report and draft conceptual model

Task 4: Reports, deliverables, workshops, and recommendations for Phase II

Phase II: Regulatory approach

Task 5: Augment toxicity information

Task 6: Submit a Toxicity Study Work Plan

Task 7: Develop final conceptual model for different levels of effects

Task 8: Develop criteria for evaluating additional methods to determine effects in receiving waters

Task 9: Develop additional methods

- Identify methods (beyond conventional toxicity tests and TREs) for evaluating toxicity to aquatic life in receiving waters

- Apply criteria developed in Task 8 to evaluate efficacy of additional methods
- Evaluate if low-level effects in toxicity tests translates to observable receiving water effects
- Provide recommendations for additional methods for evaluating receiving water impacts
- Develop a flow chart for the TRE process that includes additional methods for evaluating receiving water impacts
 - o Alternative lab control water
 - o Split testing
 - o Appropriately designated in-stream waste concentrations
 - o Receiving water bioassessment
 - o Toxicity assessment of receiving waters upstream and downstream of POTWs

Task 10: Implement and coordinate with CVCWA and CVRWQCB and other stakeholders

Task 11: Develop draft toxicity policy recommendations

Task 12: Reports, deliverables, workshops, and policy recommendations

Timeline:

A draft Phase I report is targeted for submittal on August 15, 2017, which will be followed by meetings that will result in the submittal of a final Phase I report on October 15, 2017. The Phase II Work Plan will be finalized by December 15, 2017, with a final report targeted for June 30, 2018.

State Water Board (SWB) and Regulatory Efforts Related to this Special:

The SWB is seeking to finalize the revisions to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries (State Implementation Plan, or SIP) by the end of 2017. The SIP as drafted will include a number of changes to toxicity testing requirements in NPDES permits, and this special study seeks to provide additional tools for POTWs to use in resolving cases of low level toxicity.

Benefits of a Collaborative Special Project:

This special project is benefitting from a collaborative effort in multiple ways. First, the direct experience of POTW operations and compliance evaluations of many CVCWA members has directly influenced the foundational need for the special project. Furthermore, a number of CVCWA members are serving on the CVCWA Special Project Steering Committee, which will provide direct feedback on the work products developed by the LWA/PER/RBI team for the study. Finally, the collaborative approach is cost-effective for Special Project participants and the Regional Water Board.