Attachment 1

Draft Policy for Toxicity Assessment and Control
Summary

Background

Toxicity testing is an essential component of an integrated approach to water quality-based toxics control and serves as a means of determining the aggregate effects of discharge constituents on aquatic life. Toxicity tests are conducted using laboratory-bred organisms and effluent or ambient water samples in order to examine the chronic or acute effects of a given discharge or receiving water. Presently, the Regional Water Quality Control Boards (Regional Water Boards) are authorized to develop toxicity provisions in their respective Regional Water Quality Control Plans (Basin Plans), while section 4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP) establishes minimum testing requirements. As a result, toxicity testing requirements vary widely amongst the Basin Plans and permits. The *Policy for Toxicity Assessment and Control* (draft Policy) would further standardize toxicity testing, improve data analyses, and fulfill State Water Board requirements.

Methodology

The numeric objectives introduced in the draft Policy are based upon U.S. EPA's Test of Significant Toxicity (TST). This statistical approach to toxicity analysis was designed to build upon the current hypothesis test method used for toxicity monitoring by providing adequate statistical power, improving incentives for laboratory precision, and incorporating biological significance. In order to increase power and prevent the occurrence of false negatives, the TST establishes Type II error rates for the various organisms used in toxicity testing. This method also restates the traditional null hypothesis so that an effluent is assumed to be toxic until demonstrated otherwise through the rejection of the null hypothesis. This provides dischargers with an incentive to strive for a high level of test precision. The biological impact of a discharge is estimated using regulatory management decisions (RMD) derived from the U.S. EPA-approved "inhibition concentration" endpoint. These effect thresholds, set at 0.75 for chronic toxicity and 0.80 for acute, also serve as the objectives upon which the draft Policy is based. In addition, the TST reduces the number of sample concentrations currently needed for routine monitoring from five dilutions to just one: the in-stream waste concentration (IWC).

Draft Policy

<u>Numeric Objectives</u>: The draft Policy proposes numeric chronic and acute toxicity objectives to protect aquatic life beneficial uses in all inland surface waters, enclosed bays, and estuaries in California. The chronic and acute toxicity objectives are expressed as statistical null hypotheses that must be rejected in order to demonstrate that a significant level of toxicity is not present in an effluent or receiving water:

Chronic Toxicity Objective:
H_0 = Mean response (IWC) $\leq$ 0.75 • mean response (control)

Acute Toxicity Objective:
H_0 = Mean response (IWC) $\leq$ 0.80 • mean response (control)

Implementation of the objectives differs depending upon whether the affected entity is categorized as a wastewater discharger, a storm water discharger, or a channelized discharger.

NPDES Wastewater Dischargers and Point Source WDR Dischargers: The chronic toxicity RMD will be used to set maximum daily effluent limitations (MDEL) and average monthly effluent limits (AMEL) for all NPDES wastewater and point source WDR dischargers that demonstrate reasonable potential to exceed water quality objectives. Due to the high volume of discharge and inability to control influent, all major POTWs will be assigned reasonable potential and will be required to conduct monthly chronic toxicity monitoring. Other dischargers that demonstrate reasonable potential will be required to follow a monitoring schedule based on the discharger's design flow rate. Facilities that discharge one million gallons a day or greater will also be required to conduct chronic toxicity testing on a monthly basis, while those that discharge less than one million gallons a day will be required to monitor on a quarterly basis. The chronic MDEL/AMEL will be applied upon any permit issuance, reissuance, or reopening to occur after the effective date of the Policy. The acute toxicity MDEL/AMEL can be applied at the discretion of the applicable Water Board.

Routine monitoring (i.e. using IWC samples and the test organism that displays the greatest level of sensitivity during a reasonable potential analysis) will be required in order to determine compliance with the MDEL/AMEL, and dischargers will be obligated to use the TST for all toxicity data analyses. Test results that indicate a “pass” (i.e. demonstrate bioequivalence between the IWC sample and the control) will be interpreted as meeting the MDEL, while those that indicate a “fail” (i.e. the two samples are not bioequivalent) will be considered an exceedance of the MDEL if the effect level is at or above 0.50 for chronic toxicity, or 0.40 for acute. If the results indicate a “fail” below the 0.50 effect level, the discharger will be required to conduct two confirmatory tests within the same calendar month to determine compliance with the AMEL. If either of these subsequent samples also “fails,” the discharger will be in exceedance of the AMEL. Exceeding an MDEL or AMEL will result in a violation and will trigger an accelerated monitoring schedule consisting of 4 additional toxicity tests. A discharger will be required to implement a Toxicity Reduction Evaluation Work Plan if an IWC sample “fails” above the regulatory management decision during accelerated monitoring.

Storm Water Dischargers and Channelized Dischargers: Storm water dischargers (i.e. municipalities and individually permitted industries) and channelized dischargers (i.e. operations subject to the Irrigated Lands Regulatory Program and other nonpoint source discharges directed through a channel, that are not regulated under the NPDES Permit Program) that are presently required to monitor toxicity will be required to use the TST method for all data analyses after the effective date of the draft Policy.