Part III

Toxicity Objectives Task Force Report

TOXICITY TASK FORCE

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11-Oct-95

TOXICITY TASK FORCE
ATTENDANCE ROSTER

Interest Category		Name	April-18	April-19	May-17	June-28	July-26	August-23	September-27
POTW	M	Rodger Baird							
POTW	A	Bob Berger							
Stormwater	M	Robert Hale							
Stormwater	A	Jim Scanlin							
Industry	M	William R. Gala							
Industry	A	Ellen Johnck							
Agriculture	M	Robert S. Hedrick							
Agriculture	A	Norman Blackwell							
Water Supply		Douglas D. Drury							
Water Supply	A	Roger James							
Environmental	M	Victor C. Furtado							
Public Health	M	Nadine M. Feletto							
US EPA	M	Debra Denton							
US EPA	A	Robyn Stuber							
Fish & Wildlife	M	Robert Fujimura							
Regional Bds.	M	Gordon Anderson							
Regional Bds.	A	Shirley Birosik							
State Board	M	Stephanie Rose							
State Board	A	Victor de Vlaming							
	M=Member			=Attendance		* Peter Rogers & Kim Dinh attended for Public Health			
	A=Alternate					** Andrew Glickman attended for Industry			
						*** Lori Pettegrew attended for Stormwater			

TOXICITY TASK FORCE

TO: Members - State Water Resources Control Board

FROM: Toxicity Task Force

DATE: September 27, 1995

RE: Recommendations

We respectfully submit this report consisting of 18 pages including this cover memo for your consideration.

Consensus was achieved on 6 of the 10 recommendations. Unless noted, the rationale also expresses the consensus of the task force.

One stakeholder objects to #6; two stakeholders object to #8; one stakeholder objects to #9; two stakeholders object to #10 and two stakeholders support a Narrative Objective but suggest different language. The rationale for and against the four recommendations are presented by the interested stakeholders.

We thank you for this opportunity to assist you in developing viable plans for the Inland Surface Waters and Enclosed Bays and Estuaries of California.

TOXICITY TASK FORCE

RECOMMENDATION #1 - TOXICITY TEST VARIABILITY

The SWRCB should consider and take into account both intra-test and inter-test variability in the implementation of toxicity objectives. All available information, including, but not limited to, that from sources such as the Pellston conference and WERF research should be considered.

RATIONALE

Because aquatic toxicity tests involve the responses of living organisms, data derived from conventional chronic and acute toxicity testing may be more variable than routine chemical analysis. This is apparent not only among the replicates that make up a single toxicity determination (intra-test or within-test variability) but also between laboratories testing the same sample or a single laboratory testing a reference sample over time. Several statistical approaches have been suggested and/or developed for dealing with test variability, but no consensus has been reached on the appropriate statistical approach.

RECOMMENDATION #2 - IMPLEMENTING TOXICITY OBJECTIVES

The SWRCB should adopt a process to implement the toxicity objective that includes the following elements:

a) routine monitoring and trigger if there is a "toxic event" then go to
b) accelerated monitoring if there is persistent toxicity then go to
c) a toxicity reduction evaluation (TRE) and if necessary
d) a compliance schedule (which may include Best Management Practices, permit limits, etc.) to reduce toxicity.

RATIONALE

The focus of implementation processes for the toxicity objective is on preventing adverse impacts from toxicity in surface waters. A finding of persistent toxicity in ambient waters or demonstrated toxicity-related impacts on receiving water biota triggers actions to control sources of toxicity to the point that degradation of uses is not occurring.

Components of implementation may include: (1) routine monitoring for toxicity with appropriate standardized (or otherwise Board-accepted) toxicity test

methods; (2) accelerated monitoring if "triggered" by toxicity results; (3) Toxicity reduction and identification (TRE/TIE) if toxicity is persistent; (4) compliance schedule to reduce toxicity where appropriate.

Routine Monitoring

For permitted point source discharges, where a finding of "reasonable potential" has been made, monitoring of effluent and ambient waters for toxicity would be appropriate; if a TIE/TRE is necessitated by persistence of ambient water toxicity, the TIE would appropriately include evaluation of point source as well as other ambient site (including non-point source) contributions.

For currently un-permitted flows to surface waters (includes a variety of non-point and some point sources), ambient water and source water surveys for toxicity would be appropriate on a periodic basis to insure that water quality objectives were being met.

Toxicity Trigger

There is a consensus recommendation that toxicity triggers be used in the Implementation Process. The toxicity trigger value may vary for different waterbodies and points of applications. The following examples are given as possible ways numeric test values might be used quantitatively as triggers. These examples are not presented as consensus recommendations.

Trigger Option #1 [Referred to as the "traditional" no-observable-effect-concentration/ toxicity unit (NOEC/TU) - based trigger.]

A. Example:Median (of 3-5 ?) ambient water tests with > 1.0 TU triggers increased monitoring frequency. [TU could be defined per USEPA's TSD in terms of either hypothesis test or IC_p endpoints].

B. Example: Median (of 3-5 ?) effluent tests with > 1.0 TU triggers increased monitoring frequency [appropriate dilution applied to TU definitions if allowed].

C. Example: Single sample result of xTUs (where x equals a "high" value) triggers "immediate" resample and retest, and examination of any available ambient water or point source observations, chemical data, etc. (see current permit language for typical actions of this type now required by Regional Boards).

Trigger Option #2 [Referred to as the "Average Effect Level" numeric trigger]

This option requires that an effect level for test response be established as a trigger. This effect level can be derived in terms of "biosignificance", empirically in terms of "reliable response level" (RRL) of a protocol/organism/endpoint, or based upon practicality (i.e.,"we may trigger a TIE, so how much effect has to be present to have a successful TIE, so that toxicity can be reduced?").

A. Example: Average effect level, EL_X in (3-5 ?) samples of ambient water exceeding target effect level (EL_T) will trigger increased monitoring frequency [Note: this is basically a testing design featuring only control and ambient water samples].

B. Example: Average effect level EL_X in (3-5 ?) samples of effluent exceeding target effect level (EL_T) will trigger increased monitoring frequency. [Note: this is a classical multiple dose-response testing design to determine the point estimate, EL_X, with robust statistical models].

C. Example: Single sample with $>EL_{50}$ (?) will trigger immediate resample and retest. [See notes under options 2A and 2B regarding test design for effluents and ambient waters.]

Trigger Option #3 [Referred to as the "Probability Based Effect Level" numeric trigger.]

This option requires that an effect level for test response be established as a trigger, as in trigger option #2. Examples given below use the RRL as described in POTW (CASA-Tri-TAC) proposals as target effect levels for probability based comparison. This option could allow selection of different probability levels for various levels of confidence, depending upon designated use and protection scenario, and action being triggered.

A. Example: If the cumulative probability is less than $p= 0.05$ (or other false positive/negative rate) that four consecutive ambient water test results (EL_X) are less than the target effect level (EL_T = RRL of test protocol), then increased sampling frequency is triggered. [See note under option 2A].

B. Example: If the cumulative probability is less than $p= 0.05$ that four

consecutive effluent sample test results (as EL_X) are less than the target effect level (EL_T), then increased sampling frequency is triggered. [See note under option 2B].

C. Example: A single sample with $p < 0.05$ that $EL_X < EL_T$ triggers an "immediate" resample-retest. [See notes under option 1.C.] [EL_T here could either be the RRL or other effect level commensurate with a particular protection strategy, e.g. LC_{50} to identify potential lethality sources.]

Increased Testing Frequency

The consensus recommendation to use numeric triggers in the Implementation Process is worded such that the first action "triggered" after detection of repetitive toxicity is an increased frequency of monitoring; subsequent detection of "persistent" toxicity in the increased monitoring program leads to a TIE/TRE process. The definition of persistent in this context has been remanded to the State Board staff. For the purpose of delineating the Implementation Process here, some examples of how increased monitoring might lead to determination of "persistent" are given, using the numeric trigger options as a guide for internal consistency in logic.

Under Trigger Option # 1: ("Traditional" numeric trigger)
Increase frequency of testing to weekly for four (?) weeks. If 2/4 tests show greater than 1.0 TU, initiate a TIE.

Under Trigger Option # 2: ("Average Effect Level" numeric trigger)
Increase frequency of testing to weekly for four (?) weeks. If average $EL_X > EL_T$, initiate a TIE.

Under Trigger Option # 3: ("Probability Based Effect Level" numeric trigger). Increase frequency of testing to weekly for four weeks. If the cumulative probability is less than $p = 0.05$ (?) that $EL_X < EL_T$ for the four test results, initiate a TIE.

TIE/TRE Process.

The consensus recommendation on the Implementation Process leads to a TIE/TRE if persistent toxicity is found. This section only gives a generic description of what the elements of a TIE/TRE could be, in context of a narrative objective and Implementation Process. As such, this type of detail is

probably outside the scope of language that would appear in the Plans.

The focus of this portion of the implementation process is to reduce toxic effects that may be (or could eventually) causing designated use impairment. If persistent ambient toxicity is detected, an ambient TIE is warranted. An ambient TIE could include review of existing chemical and toxicity data from ambient and point source waters, TIE testing (as prescribed in USEPA TIE guidance) of ambient and source waters, and concerted evaluation of the watershed or stream reach.

A successful TIE would lead to toxicity reduction via TRE steps, source reduction, or other control measures. These may include imposition of permit limits (chemical or toxicity) on point sources, which could require increased treatment measures or pretreatment control steps; compliance schedules may be warranted for specific purposes. Other measures may include public awareness programs to eliminate certain product usage or waste product disposal, watershed credit trading (if allowed within regulations), or other innovative practices.

RECOMMENDATION #3 - VARIANCES

The SWRCB should include the original language allowing for variances found in the former ISWP/EBEP.

RATIONALE

It is possible that the Plans may conflict with other state and federal regulations, such as the Safe Drinking Water Act (the use of copper based herbicides) and the California Health and Safety Codes. In addition, it may be necessary to implement control measures for vector and weed control, pest eradication, or fishery management which are being conducted to fulfill statutory requirements under California's Fish and Game or Food and Agriculture Codes. Therefore, it may be necessary to issue variances to the Plans where conflicts exist. Variances should also be considered for draining water supply reservoirs, canals, pipelines and stormwater detention facilities.

RECOMMENDATION #4 - ADDITIONAL TEST ACCEPTABILITY CRITERIA

The SWRCB should develop additional test acceptability criteria to judge validity of tests.

RATIONALE

Test acceptability criteria (TAC) set minimum requirements for performing toxicity tests. Both effluent and reference toxicant tests must meet these TAC. These minimum requirements are clearly identified in the toxicity testing methods. The development of additional TAC would assist laboratory investigators and permitting authorities in evaluating the acceptability of test results and improving test precision and sensitivity. For example, test sensitivity, control variability, reference toxicant performance, and dose response consistency have been suggested as areas where additional TAC may be appropriate. This recommendation is related to Recommendation #1.

RECOMMENDATION #5 - UNIFORM TOXICITY OBJECTIVE

The SWRCB should adopt one uniform toxicity objective. Implementation provisions (e.g., point of application) may vary.

RATIONALE

Since the physical, chemical and biological characteristics as well as beneficial uses of California waters vary greatly, the question arises whether there should be individual toxicity objectives that address the unique aspects of each situation such as agricultural runoff, effluent dominated streams and ephemeral streams. However, the Task Force concludes that the aquatic life beneficial uses of all waters of the State must be protected and that a single uniform objective is the best approach.

This single objective should be phrased such that it applies to all situations and water body types which have the designated beneficial use of supporting aquatic life. Divergent situations and water body types can be addressed by implementation processes (see Recommendation #2) appropriate to the specific situation or body type. The Task Force agrees that the special concerns of most of the stakeholder groups can be adequately addressed through such specific implementation provisions that recognize the unique characteristics of

effluent releases and/or receiving waterbodies. This consensus recommendation is closely linked to a narrative toxicity objective (Recommendation #10) which is implemented through a process that includes routine toxicity monitoring with appropriate indicator species.

This approach has several advantages. It would ensure state-wide consistency. It would be more easily implemented for both point and non-point sources of pollution. Finally, it would link well with the Task Force's recommendation to use a narrative objective, which is broad enough to encompass all the water bodies to be covered by these Plans.

RECOMMENDATION #6 - ALTERNATIVE TEST METHODS

The SWRCB should consider alternative test methods for toxicity monitoring which meet alternate testing procedure requirements.

RATIONALE - IN SUPPORT (POTW, Agriculture, Water Supply, Environmental, USEPA, Fish & Wildlife, Regional Boards, State Board) (Stormwater abstained)

Federal regulations require permitting authorities to use analytical methods listed at 40 CFR Part 136. Approved toxicity test methods are detailed in USEPA/600/4-90/027F acute test methods for freshwater and marine test species, USEPA/600/4-91/002 chronic test methods for freshwater test species, and USEPA/600/4-91/003 chronic test methods for estuarine and marine test species. Usually the use of indigenous species for toxicity testing is discouraged by USEPA because of the lack of standardized testing procedures, including quality assurance requirements and culturing methods. USEPA is developing alternative testing procedures that will specify minimum requirements for approval of new standardized test methods.

Not withstanding the rationale above, USEPA will stay the application of 40 CFR Part 136, as it applies to measurements of chronic toxicity to west coast marine waters and recommends the use of standardized west coast marine species in USEPA/600/R-95/136.

RATIONALE - IN OPPOSITION (Industry)

SWRCB should not allow new test protocols for toxicity monitoring. Industrial dischargers agree with USEPA's historic policy of discouraging the use of

alternative and/or indigenous species for toxicity monitoring. There are numerous QA/QC problems associated with using indigenous species. Unlike the standard USEPA organisms, most dischargers and testing laboratories will have little experience with indigenous species, thus, finding a quality testing laboratory to perform the toxicity monitoring may be difficult. Indigenous species will also have a poorer selection of suppliers so that year-round availability for routine monitoring may also be problematic. Lastly, because indigenous species will not have published TIE methods, dischargers using indigenous species will be at a great disadvantage when attempting to identify and control sources of effluent toxicity. Too often dischargers have been required to solve these QA/QC problems while attempting to perform routine monitoring of their discharges.

Besides the above QA/QC problems associated with using indigenous species, there is little scientific basis that using indigenous species for toxicity monitoring will provide additional protection of the beneficial uses of receiving waters. The standard USEPA test organisms have been tested against hundreds of toxicants, and have been found to be among the most sensitive species tested in the laboratory. Generally, little will be known regarding an indigenous species' response to different toxicants. Thus, there will be little evidence that the response of an indigenous species to the wide range of toxicants found in industrial and municipal effluents, stormwaters and ambient waters will be protective of other organisms that reside in the receiving water. In addition, because it is unlikely that the response of any indigenous species will represent the most sensitive species in a given receiving water, it is questionable that the selected indigenous species will be any more protective of the receiving water than test results using the standard USEPA species. Industrial dischargers question the need for using indigenous species especially when there is no evidence that their use will result in either a demonstrable improved protection of the beneficial uses of waterbodies or in reduced regulatory costs with equivalent protection of beneficial uses.

RECOMMENDATION #7 - CHLORINE AND AMMONIA TOXICITY

The SWRCB should evaluate alternative approaches to monitoring and controlling chlorine and ammonia toxicity.

RATIONALE

Chlorine

Chlorine is a commonly used disinfectant, largely because it is toxic at very low concentrations. The USEPA "Gold Book" recommends a chlorine concentration of less than 0.019 mg/L to prevent acute toxicity. Chlorine is among the toxicants that readily dissipates with time and organic matter.

Historically, chlorine was not considered a pollutant. More recently, dechlorination has been required. Permit limits for chlorine residual concentrations have been lowered as process control equipment has become more sophisticated. Originally, chlorine residual limits were 0.5 mg/L. Now effluent chlorine residuals of 0.1 mg/L are common and <0.01 mg/L are obtainable. However, not every POTW has the equipment or expertise to achieve a chlorine residual low enough to prevent toxicity.

Because chlorine concentrations will dissipate with time, toxicity from chlorine will vary. As a result chlorine can cause variability in toxicity tests. The chlorine caused variability in the acute toxicity test is eliminated with procedures that allow for the dechlorination of the sample before the test is conducted. The chronic test procedures do not explicitly allow for the dechlorination of sample before the test is conducted.

The State Board staff should consider the costs involved in dechlorinating to a chlorine residual of <0.01 mg/L in developing the proposed ISWP/EBEP.

Ammonia

Ammonia in concentrations typically found in POTW effluents is toxic to some aquatic life. In order to prevent whole effluent toxicity, POTW's would have to nitrify. The cost to provide increased aeration capacity and tankage for nitrification can be significant. Some of the costs of nitrification can be mitigated through the reasonable use of acute and chronic mixing zones.

The State Board staff should consider how best to address ammonia toxicity and the costs of nitrification in developing the ISWP/EBEP.

RECOMMENDATION #8 - MIXING ZONES

The SWRCB should make available acute and chronic mixing zones for determining compliance with toxicity requirements consistent with USEPA guidance.

RATIONALE - IN SUPPORT (POTW, Stormwater, Industry, Agriculture, Water Supply, Environmental, USEPA, State Board)

The implementation of mixing zones for defining the point of application for in-stream water quality, including toxicity, objectives is scientifically sound, environmentally protective and cost-effective. The underlying assumption for allowing mixing zones is that a small area of concentrations in excess of acute and chronic objectives can exist without adversely affecting the overall beneficial uses of a waterbody. The USEPA has historically and does currently allow for the use of mixing zones. The use of mixing zones to specifically implement toxicity objectives is clearly supported by the most recent USEPA whole effluent toxicity (WET) policy - "The permitting authority should evaluate WET water quality criteria attainment for acute WET at the edge of the acute mixing zone and for chronic WET at the edge of the chronic mixing zone..." (see p.4, Whole Effluent Toxicity (WET) Control Policy, USEPA, Office of Water, USEPA 833-B-94-002, 1994).

USEPA's Technical Support Document (TSD) for Water Quality-Based Toxics Control (USEPA/505/2-90-001, 1991) and other USEPA documents provide the basis for implementing mixing zones that are scientifically sound and environmentally protective. The TSD lists the following characteristics for allowable mixing zones: 1) Mixing zones do not impair the integrity of the waterbody as a whole; 2) There is no lethality to organisms passing through the mixing zone; and 3) There are no significant health risks, considering likely pathways of exposure. The TSD provides guidance for analyzing mixing zones to ensure the above characteristics are met. Mixing zones are technically definable through the various detailed reports and textbooks on the hydrodynamics of mixing, through the commonly used USEPA-approved models, and through field measurement techniques (e.g., dye tracer studies). Current technologies related to modeling mixing zones (to determine size of mixing zones), assessing time and exposure of organisms passing through mixing zones (to prevent lethality to passing organisms), and conducting bioassessments in the receiving water (to assess whether beneficial uses are being protected) are sufficient to evaluate whether mixing zones will be protective of the beneficial uses of the waterbody.

Excluding the consideration of mixing zones in developing WET permit limits results in end-of-pipe controls that are technology-based, not water quality-based. The lack of relevance that this type of control results in is highlighted by the situation in which a fresh water effluent is discharged into a saline estuary or bay. Acutely toxic effects will naturally occur, regardless of the quality of the effluent, because marine biota cannot live in the fresh water that will occur in close proximity to the end-of-pipe.

Excluding the consideration of mixing zones in developing WET permit limits is inconsistent with California's commonly accepted practices for controlling the discharge of individual chemicals. In the previous Water Quality Plans, acute and chronic concentration limits for chemicals "shall be imposed such that the water quality objectives established by this plan shall not be exceeded in the receiving water outside any designated mixing zone". Establishing different applications of mixing zones in permits is not justified (i.e., acute mixing zones are allowed for chemical-specific limits but not for WET limits), since there is no evidence that protecting biota from acutely toxic effects would be any less effective when predicted by WET tests than when the prediction is based on chemical analyses.

RATIONALE - IN OPPOSITION (Fish & Wildlife, Regional Boards)

The Regional Boards and California Department of Fish and Game strongly oppose allowing acute toxicity mixing zones in inland waters and enclosed bays and estuaries. Protecting aquatic life from exposure to substances causing acutely toxic effects is a major concern. Acute mixing zones could represent a permanent loss of aquatic habitat or significantly impact the aquatic communities of receiving waters. While some organisms may avoid the affected area, others may be attracted to the area, become entrained in it, or remain in the mixing zone for other reasons (e.g., attached aquatic plants or sessile fauna).

Acute toxicity mixing zones are not currently recognized for inland waters of California. Allowing acute mixing zones would represent a step backward in the protection of aquatic life. Lethality is an extreme response that is often preceded by a range of sublethal responses. Permitting the discharge of acutely toxic substances increases the likelihood that adverse effects may occur in the receiving water and could contradict other water quality protection statutes. Beneficial uses must be protected throughout each water body where they occur. Receiving waters are a public resource and should not be used to treat or dilute wastes to non-toxic levels.

RECOMMENDATION #9 - SINGLE TEST RESULT NOT A VIOLATION

The SWRCB should adopt a provision that: No single test result shall constitute a violation.

RATIONALE - IN SUPPORT (POTW, Stormwater, Industry, Agriculture, Water Supply, Environmental, USEPA, Regional Boards, State Board)

California's Water Quality Control Plans for Enclosed Bays and Estuaries, and Inland Surface Waters contained acute and chronic toxicity objectives, and a process to implement water quality-based toxicity control. One controversial element in the adopted implementation process was the determination of compliance (or violation) with an acute or chronic toxicity permit limitation using whole effluent toxicity (WET) tests. Concern centered on the variability of test results (especially chronic WET tests) and the reliability of these test results in determining permit compliance. In addition single toxicity test results cannot characterize the duration, magnitude or frequency of the toxicity measured in ambient waters or discharge sites.

The above recommendation would use single toxicity test results to initiate an explicit toxicity control response, rather than solely as a means to determine compliance with a toxicity objective. This is an important part of a comprehensive regulatory approach that emphasizes a resolution (i.e., identifying the source or cause) of potential toxicity problems. The recommendation offers the following advantages for successful control of toxicity in California's surface waters:

- **It broadens the use of toxicity monitoring and control to ambient waters and to all point and non-point source discharges.**

Using single toxicity test results to determine permit compliance would only apply to permitted dischargers. On the other hand, using toxicity test results to initiate a standardized investigation and resolution processes (see Recommendation #2) is applicable to ambient waters, as well as to other potential sources of toxicity that may be unregulated.

- **It emphasizes the identification and resolution of toxicity problems.**

The variability associated with toxicity tests may not always allow a clear indication from a single test result that toxicity will adversely impact the designated uses of a water body, nor can single test results characterize effluent

or ambient water toxicity in terms of duration, magnitude or frequency. Equally important, resolution of unacceptable toxicity through the Toxicity Identification/Reduction Evaluation (TI/RE) process requires toxicity to be demonstrated on more than one occasion. USEPA states in its TIE guidance[1] that "TIEs require that toxicity be present frequently enough so that repeated testing can characterize and subsequently identify and confirm the toxicants in Phases II and III. Therefore, enough testing should be done to assure consistent presence of toxicity before TIEs are initiated."

RATIONALE IN OPPOSITION (Fish & Wildlife)

The Department of Fish and Game recommends adopting a policy where the Regional Board staff can use the results of a single toxicity test as a part of enforcement action in extreme circumstances. We feel that to adopt a policy where the Board could use not the results of a single toxicity test would unnecessarily weaken the importance of whole effluent testing and remove an enforcement option from the Regional Boards.

The Department of Fish and Game supports efforts for the prompt resolution of potential and existing toxicity problems though standardized investigation and resolution processes incorporated in discharge permits. In general, no single test result should constitute a violation if the discharger adequately complies with its NPDES permit for prompt identification of the toxicity event and takes appropriate action such as accelerating testing and/or conducting a TRE. Exceptions to this general guideline should include where the toxicity exceedance is of large magnitude or contributed to a significant environmental impact.

Although some stakeholders have concerns about the use and interpretation of certain toxicity test results, it would be unwise to consider diminishing the significance of extreme results for all toxicity tests (e.g., high acute toxicity). Toxicity test results are generally more reliable and less variable in detecting large-scale responses. Extreme responses may signal that significant environmental damage may be occurring. Because routine whole effluent toxicity testing may occur less frequently than other NPDES monitoring requirements and receiving water monitoring generally occurs even less, a single test result may be the only evidence that a serious, deleterious discharge

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[1] U.S. EPA. 1988. Methods for Aquatic Toxicity Identification Evaluations. Phase I Toxicity Characterization Procedures. EPA-600/3-88/034.

has or is occurring. Therefore, the Regional Boards should retain their discretionary power to enforce toxicity permit limits or compliance objectives when they deem it appropriate.

RECOMMENDATION #10 - NARRATIVE OBJECTIVE

#10 A (supported by POTW, Industry, Water Supply, Environmental, USEPA, State Board)

The SWRCB should adopt the following narrative toxicity objective: Surface waters outside of any allowed mixing zones shall be free from lethal or sub-lethal toxicity in amounts which impair designated aquatic resource beneficial uses. Aquatic life community structures and function shall not be degraded by toxic discharges.

#10 B (supported by Agriculture, Stormwater)

The SWRCB should adopt the following narrative toxicity objective: Surface waters outside of any allowed mixing zones shall be free from lethal or sub-lethal toxicity in amounts which impair designated aquatic resource beneficial uses.

RATIONALE IN SUPPORT OF #10 A

A major difference in adopting a narrative rather than numeric objective is the potential flexibility afforded in the implementation of a uniform objective for the wide variety of water quality and use protection situations in California. The underlying reason for this difference is found in 40 CFR 122.44(d)(1)(iv). This provision essentially requires that, where numeric toxicity objectives are in force, numeric permit limits for WET are required if "reasonable potential" is determined: any single exceedance of a permit limit is a NPDES permit violation subject to the full range of State and Federal enforcement actions. However, for a narrative objective, determination of "reasonable potential" does not automatically mandate imposition of numeric limits for effluent toxicity in permits [Section 122.44(d)(1)(v)].

Although a narrative objective does not preclude numeric permit limits, it does allow options in the implementation process for controlling toxicity in ambient waters via permit requirements and other measures besides merely imposing a

numeric effluent limit. These options should facilitate State and Regional Board implementation of toxicity control for a wide variety of surface water protection situations. On the other hand, a numeric objective for toxicity potentially reduces the flexibility that a regulatory authority has to satisfy USEPA's permit regulations (40CFR Part 122), and is seen by many as a more inflexible application of WET test results in regulations.

Much of the opposition to WET testing which has historically come from the discharger community, while based upon a number of technical arguments, was driven largely by the perceived likelihood that WET limits would be imposed in the form of numeric effluent limits. Currently, since a single WET test exceedance could result in a permit violation, the technical debates about test variability and predictiveness are invoked in opposition to use of WET in compliance determinations. In short, the prescriptive nature of a numeric toxicity objective is seen by dischargers as primarily coercive, with focus on effluent limits rather than designated use protection of a waterbody. Although these arguments may or may not be persuasive by themselves in selecting a toxicity objective, there are regulatory issues which should be considered on their own merits, and which potentially help resolve or avoid a number of problems. Much of the remainder of this discussion relies upon comparing or contrasting the narrative and numeric approaches.

Adoption of a single numeric toxicity objective potentially reduces the ability to deal responsively with a variety of site-specific water quality needs and beneficial uses in the State. The numeric objective approach complicates use of a single objective with potentially different implementation provisions (e.g., point of application) as tentatively agreed upon by the Toxicity Task Force. While the single test exceedance/violation problem alluded to above can be lessened by incorporation of averaging periods for toxicity in permit limits, this strategy is arguably not the optimal approach to deal with all point sources, nor the most efficacious way of using toxicity monitoring results to control potential ambient water toxicity from unpermitted sources such as non-point stormwater or agricultural sources, or of handling ephemeral stream and effluent dominated stream issues.

Adoption of a narrative objective with distinct implementation steps potentially increases the array of permitting possibilities and available responsive actions for dealing with specific waterbody needs. The narrative objective approach also provides a mechanism and incentive for major dischargers to monitor beyond the end of their pipes in the watershed.

The State Water Resources Control Board identified watershed management as one of five key elements in its Strategic Plan. Watershed management attempts to resolve water quality problems by comprehensively controlling both point and non-point source discharges. Under a numeric toxicity objective, permitted dischargers will have little or no incentive to extend monitoring beyond attempts to comply with individual permit limits, whereas implementation of narrative objectives to protect surface waters in a given watershed would incorporate monitoring beyond end of pipe. Ambient water TIE requirements will encourage dischargers to evaluate watersheds into which they discharge, possibly prior to permit violations or before toxic events from other possible sources. Adoption of numeric objectives will likely perpetuate the emphasis on permitted point source discharges, and failure to adequately assess other contributions of toxicity in a watershed.

A narrative toxicity objective can facilitate the implementation steps which have been tentatively agreed upon by a majority of the Task Group, which include routine monitoring, accelerated monitoring in the event of a toxicity exceedance, TRE if toxicity is persistent, and a compliance schedule to reduce toxicity. It would be difficult to apply this approach (especially on a watershed basis) if a numeric objective is adopted.

A numeric rather than narrative toxicity objective might be seen as an obstacle to use of toxicity test results in the resolution of water quality problems. Because of the strict liability associated with permit violations, WET tests may not, therefore, be perceived as tools for identifying and resolving toxicity problems in water bodies, but rather as uncompromising permit compliance measures. This was referred to earlier in the discussion as "inflexible"; such usage will probably intensify the emphasis for USEPA to resolve technical concerns with the precision and predictiveness of WET test methods and results before use in numeric limit compliance, rather than using them as a basis for more comprehensive monitoring and control programs.

RATIONALE IN SUPPORT OF 10 B

Two stakeholders (agriculture and Stormwater) believe the second sentence of the objective contained in recommendation #10 A is unnecessary, ambiguous and may be inconsistent with the provisions of the Porter-Cologne Water Quality Control Act.

The language provides no additional protection because aquatic life community structures and functions are reasonably protected within designated beneficial

uses. Accordingly, adding the second sentence is redundant and risks confusion.

Finally, the language may be construed as being absolute and therefore inconsistent with the definition of water quality objectives set forth in Water Code Section 13050(h) which provides for reasonable protection of beneficial uses. See also Water Code Sections 13050 (i) and 13241.

With the above qualification we adopt the rationale given in support of recommendation #10 A, but not recommendation #10 A.

RATIONALE IN OPPOSITION TO #10 A and #10 B (Fish & Wildlife, Regional Boards)

The Department of Fish and Game favors the establishment of a statewide, numeric chronic toxicity objective that would provide adequate, uniform, and consistent protection of aquatic life in California and their beneficial uses that they provide. Unlike chemical specific objectives, toxicity objectives can take into account additive or synergistic effects and better protect fish and wildlife from these effects. Since only a limited number of constituents have chemical specific objectives and many constituents do not, toxicity problems from unregulated pollutants are best addressed by the use of numeric toxicity objectives. In cases where beneficial uses are impaired, it is far easier for the Regional Boards to pursue corrective actions where numeric objectives are in place. Proving a violation of a narrative objective may be more difficult. Therefore, numeric toxicity objectives provide better protection for fish and wildlife.

The adoption of a statewide numeric chronic objective would have several additional benefits. It sets an explicit level where aquatic life and their beneficial uses are affected by pollution. It provides an uniform benchmark on whether a water body is in compliance with the toxicity objective. It would simplify enforcement and compliance procedures and provide guidance for setting toxicity effluent limits. Flexibility could be introduced in implementation of permit limits by the use of average values and/or maximum magnitude levels, by varying the points of application, and by setting compliance procedures to eliminate toxicity. Other incentives could be adopted to encourage dischargers to participate in monitoring programs to identify and reduce toxicity problems in receiving waters. A numeric toxicity objective is also consistent with the chemical objective approach. Protection of California's aquatic resources merit the benefits provided by a numeric objective.