

PUBLIC REVIEW COMMENTS
Diazinon and Pesticide-Related Toxicity
Water Quality Attainment Strategy and TMDL

The 45-day public review and comment period ended September 19, 2005. The Water Board received comments from the following ten organizations. Page references refer to the .pdf file containing the compiled documents.

<u>Commenter</u>	<u>Page</u>
U.S. Environmental Protection Agency	2
California Department of Pesticide Regulation	4
Baykeeper, Pesticide Action Network, and Clean Water Action	9
Bay Area Stormwater Management Agencies Association	22
<i>Attachment 1—General and Specific Comments</i>	24
<i>Attachment 2—April 12, 2004 Letter</i>	30
<i>Attachment 3—March 16, 2005 Draft Basin Plan Amendment</i>	36
Alameda Countywide Clean Water Program	54
Santa Clara Valley Urban Runoff Pollution Prevention Program	55
<i>Exhibit A—March 7, 2003 Letter and April 12, 2004 Letter</i>	59
<i>Exhibit B—March 16, 2005 Draft Basin Plan Amendment</i>	71
City of San Jose	89
<i>Attachment—April 12, 2004 Letter</i>	96
California Department of Transportation	107
Big Valley Termite	109
<i>Attachment—September 16, 2005 Letter</i>	110
Caltest Analytical Laboratory	114
<i>Attachment 1—August 30, 2005 Documents</i>	116
<i>Attachment 2—Summer 2005 NorCal SETAC News</i>	119

September 19, 2005

Bill Johnson
San Francisco Bay Regional Water Quality Control Board
1515 Clay St. Suite 1400
Oakland, CA 94612

Dear Mr. Johnson

Thank you for the opportunity to review and comment on the Amendments to The Water Quality Control Plan for the Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks Diazinon TMDL Report dated August 5, 2005. We reviewed the proposed actions to determine whether they are consistent with applicable federal regulations concerning TMDLs. We appreciate the Regional Board's very hard work and careful analyses to develop this report. We commend your work on both the dual numeric targets for both pesticide-related toxicity and diazinon, and on the implementation plan which centers on pollution prevention. This letter provides our comments.

- We support the expression of numeric targets in terms of both as pesticide-related toxicity and diazinon concentration. This is particularly important with the recent phase out of diazinon and the concurrent increase in alternative pesticides trend. In addition, as your report states, "the toxicity target address potential interactions among whatever pesticides and other chemicals may be present in Bay Area urban creeks". This approach is supported by a recent paper addressing pesticide mixtures and their interactions (Lydy et al., 2004).
- We suggest some additional clarification on the paragraph on pesticide-related toxicity that discusses expression of toxicity units (TUs). We support the target being expressed as both an acute and chronic TU based on multi-concentration testing approach to derive the either the no observed effect concentration (NOEC) (for chronic) or a no observed adverse effect concentration (NOAEC) (for acute). We recognize that ambient testing may be employed using a single concentration of 100% water compared to a control. This approach has been utilized in a watershed regime to capture more events and samples for a fraction of the cost of the multi-concentration tests. However, we suggest the following word change, "In cases where an ambient water (100%) is compared to control then the sample should not exhibit an acute or chronic toxic effect (the ambient sample may not be significantly different from the control based on a statistical approach such as using a (t-test)". If this single concentration (100% ambient) sample is statistically significant, then it would be necessary to employ multi-concentration testing to elicit the NOEC. If this single concentration (100% ambient) sample is not statistically significant, then the sample would be achieving the pesticide-

related toxicity target. In addition, we suggest striking the language, “at least 20% greater than observed in control sample should be assumed to have a NOAEC or NOEC 100%.”

First, the single concentration testing approach cannot generate NOAEC or NOEC values. A single concentration compared to a control only informs you of the statistical difference between the two treatments. Secondly, we do not support the additional requirement that it must also be 20% greater than observed in the controls because a site that is frequently statistically significant may elicit toxic responses less than 20% of the time and therefore would not be addressed. This would not achieve aquatic life protection.

- We support expression of the TMDL in concentration units equal to the targets. Expression in concentration units versus mass loading is consistent with the recent TMDLs adopted for the Sacramento, Newport Bay, and San Diego areas.
- We support the implementation strategy that focuses on three areas: regulatory programs, education and outreach, and research and monitoring. We encourage the voluntary actions by the Water Board, USEPA, California, Department of Pesticide Regulation and other entities. We applaud you for your ongoing efforts in these areas such as supporting and funding research efforts to enhance pyrethroid analytical methods, evaluate urban trends, education and communication efforts through the Urban Pesticide Committee. All of these efforts lead to implementing effective strategies. This information will not only be useful for the Bay area, but also for other watersheds in California.
- We recognize the need for more pesticide water quality criteria and, therefore applaud your approach in developing monitoring benchmarks based on appropriate safety factors tiered based on number of data requirements satisfied. This is a reasonable approach and supported by the peer review comments by Dr. Felsot. Please correct one minor error in footnote a, “USEPA water quality criteria guidelines required data for at least eight families (instead of genera) to generate water quality criteria”.

In closing, we commend you for your hard work on the diazinon TMDL. We are committed to working with the State to identify approaches that address our shared goals of accomplishing reductions of pesticide levels in the water bodies while ensuring that legal requirements are met. We would be happy to meet with you to discuss these issues further. If you have any questions or further discussions, please call me at 916-341-5520 or denton.debra@epa.gov.

Sincerely,

Debra Denton, PhD
Environmental Scientist

Reference:

Lydy MJ, Belden JB, Wheelock CE, Hammock BD, Denton, DL. 2004. Challenges in regulating pesticide mixtures. *Ecology and Society*. 9(6):1.



Department of Pesticide Regulation



Mary-Ann Warmerdam
Director

MEMORANDUM

Arnold Schwarzenegger
Governor

TO: Bill Johnson, Environmental Scientist
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

FROM: Douglas Y. Okumura, Assistant Director
Division of Pest Management, Environmental
Monitoring, Enforcement, and Licensing
(916) 445-3984

DATE: September 19, 2005

SUBJECT: COMMENTS ON PROPOSED BASIN PLAN AMENDMENT AND STAFF
REPORT

Thank you for the opportunity to comment on the document titled *Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks*, which includes a proposed amendment to the San Francisco Bay Regional Water Quality Control Board's (Regional Board's) Basin Plan. The Department of Pesticide Regulation's (DPR's) comments are offered below.

Page 29, "Water Boards" section: This section does not appropriately orient the reader for descriptions of Regional Board activities that follow. Given the breadth of authorities and programs that the Regional Board can bring to bear on addressing water quality issues, the selection of the two sections of the California Water Code is puzzling. California Water Code section 13247 was not mentioned again in the report; California Water Code section 13225 is later described (in the report's section 4, *Environmental Impacts and Alternatives Analysis*). Unless the Regional Board is proposing to invoke these statutes, there is no purpose in singling them out. Additionally, this section of the report is too selective and too brief to provide appropriate background for the Implementation Plan and proposed Basin Plan amendment. DPR recommends amending this section so that it provides a concise, objective overview of the Regional Board's mandates and authorities so that subsequent sections of the report and the proposed amendment can be explained in the proper context.

Page 31, paragraph 2, sentence 2: To more correctly paraphrase in Title 3, California Code of Regulations (3CCR) section 6220, DPR recommends you replace "could adversely affect the environment" with "may have caused, or is likely to cause, a significant adverse impact."

Page 30, paragraph 1, sentence 1: DPR regulates the sales and use of pesticides in California, but not the manufacture.



Page 31, second paragraph: Contrary to the implication in the text of the report, 3CCR section 6158, does not help interpret “environmental harm,” nor does it describe DPR’s latitude in defining the term. Title 3CCR section 6158 simply instructs DPR to give special attention during the registration process to specific factors, such as interference with the attainment of applicable environmental standards, and DPR’s requirements and authorities to prevent environmental harm from pesticides. Title 3CCR section 6158 does not specifically link these requirements and authorities with attainment of environmental standards. According to this regulation, DPR is to act if after considering these factors, it anticipates significant adverse effects. DPR recommends amending this section to clarify this point.

Page 39, second paragraph, sentence 3: The statement “. . . all urban creeks are likely impaired . . .” is supported by an underlying assumption that urban watersheds in the San Francisco Bay area have similar land use patterns, hydrology, and pesticide use patterns, resulting in similar pesticide runoff scenarios. It would be useful to specifically state this assumption since some stakeholders are apprehensive about making conclusions about water quality in specific creeks for which no data exist.

Page 40, last paragraph, sentence 1: The author of the San Francisco Estuary Project (2005a) noted several assumptions when she estimated the fraction of pesticide use in California that occurs in urban areas. A more correct representation of the San Francisco Estuary Project (2005a) would be “. . . at least 50% and up to 75% of the pesticide use by weight occurs in urban areas”

Page 42, third bullet: Perhaps this bullet is too declarative given the lack of data. It would be more correct to state, “All urban creeks probably receive pesticide discharges”

Page 45, paragraph 2: Is it customary in total maximum daily loads source assessments to trace the origin of a pollutant all the way back to its manufacture? For trash total maximum daily loads, for example, would trash be considered the result of paper manufacture? In the case of pesticides, such an approach detracts from the importance of the most valid causes of pesticide pollution: uses of specific pesticides in situations where pesticides are most prone to be deposited directly in water and where irrigation or rain runoff transports pesticides to surface waters. We recommend modifying text and Figure 6.2 so that you do not suggest that runoff is the result of manufacturing, formulating, and selling pesticides.

Page 62, paragraph 3: In order to comment on the nature of the proposed diazinon concentration targets, the staff report should more completely describe how the proposed numeric targets were derived. The report should include the no adverse effect concentrations from Moore and Waring (1996) and Scholz et al. (2000). Presumably, these values will support the Regional Board’s selection of water quality criteria for diazinon. If they are higher than the Department

of Fish and Game's (DFG's) recommended acute criterion of 160 ng/l and chronic criterion of 100 ng/l, then the Regional Board should adopt DFG's values.

Page 75, second bullet, sentence 5: The proposed numeric targets would more accurately be described as a departure of the usual application of the U.S. Environmental Protection Agency's (U.S. EPA's) guidance for deriving water quality criteria. The usual application of the guidance—the application used by DFG—uses toxicity data from eight taxonomic categories of aquatic organisms to generate acute and chronic values that are translated into acute and chronic criteria. Instead, the Regional Board proposed values based on diazinon concentrations that elicit behavioral responses in a single taxonomic group. U.S. EPA's guidance specifically supports criteria developed under these circumstances, but it is incorrect to state that the diazinon target is largely based on criteria developed by DFG using U.S. EPA guidelines.

Page 80, Table 10.1: Please provide references for information presented in this table.

Page 81, paragraph 3: DPR recommends that the Regional Board state that the proposed actions are the result of consultations with many stakeholders, including DPR. A cooperative and collaborative approach among stakeholders enables agencies to leverage limited resources in order to improve water quality.

Page 81, paragraph 3, sentence 2: To be consistent with other references in the report and the proposed Basin Plan amendment that relate to recommended actions, “will need to” should be changed to “should.” In addition, this sentence references section 4. As commented on earlier, the incomplete description of Regional Board (and other agencies') mandates and authorities in section 4 does not appropriately prepare the reader to comprehend these proposed implementation actions.

Page 81, paragraph 4, sentence 2: It is not obvious in the implementation plan or proposed Basin Plan amendment how the Regional Board would require those responsible for pesticide use and oversight (e.g., DPR?) to take actions that will reduce pesticide-related water quality threats. More information in the report would be helpful.

Page 82, last paragraph (resumes on page 84), sentence 5: DPR looks forward to cooperating with the Regional Board in researching topics of common interest to the extent our resources allow. However, DPR has not allocated resources to respond to Regional Board requirements or directives to investigate technical factors involving water quality control and hopes there will not be an occasion to invoke California Water Code section 13225(c) with DPR.

Page 90, paragraph 2, sentence 2: The report should avoid the suggestion that DPR is being directed to use its authorities in a particular way. Please change “is to ensure” to “should.”

Page 91, third bullet: Presumably, “must share responsibility” is not meant to be considered in a regulatory context. It would be helpful if the text is made more specific.

Page 97, paragraph 1: This is an appropriate proposed use of monitoring benchmarks.

Page 102, paragraph 3: DPR is also responsible for implementing the Healthy Schools Act of 2000, which requires DPR to promote and facilitate adoption of the integrated pesticide management practices on California school sites.

Page 111, paragraph 3, sentence 4: California Water Code section 13267 apparently limits the Regional Board’s authority to obtain technical and monitoring reports from only dischargers. We recommend that the report should provide more rationale on how reporting requirements may be placed on pesticide registrants or this reference to California Water Code section 13267 should be deleted.

Page 111, paragraph 3, sentence 5: As stated above, DPR hopes that a cooperative relationship between DPR and the Regional Board would obviate the need for the Regional Board to invoke California Water Code section 13225 to obtain information from DPR.

Page 115, paragraph 1: While DPR cannot currently allocate \$675,000 per year as suggested, it is committed to cooperate and collaborate with the Regional Board in implementing the elements of Table 10.4. to the extent that its current resources and authorities allow.

Page S-1, paragraph 4, sentence 3: Pesticide regulatory programs are implemented in conformity with legislative mandates and authorities. It would be more correct to state that incongruities among controlling statutes may result in pesticide regulatory programs that do not always protect water quality standards adopted by the Regional Water Regional Water Quality Control Board (Regional Board).

Page S-2, paragraph 1, sentence 3: See comments on text on Page 45, paragraph 2 in the main body of the report.

Page S-2, paragraph 3, sentence 3: Degradation is usually considered a fate process, not a transport mechanism.

Page S-3, paragraph 2, last sentence: See comments on text on Page 81, paragraph 4, sentence 2 in the main body of the report.

Page A-3, paragraph 4: As comments on page 62, paragraph 3 stated earlier, in order to comment on the nature of the proposed diazinon concentration targets, the staff report should more completely describe how the proposed numeric targets were derived.

Bill Johnson
September 20, 2005
Page 5

Page A-6, last paragraph (resumes on page A-7), last sentence: DPR's interpretation of the Food and Agricultural Code (FAC) is that it is DPR's responsibility to determine when conditions related to pesticide sales and use are environmentally harmful. It is therefore unnecessary for the Regional Board to make such determinations. DPR strongly encourages the Regional Board to delete this sentence.

Page A-7, paragraph 1, sentence 1: This sentence is in reference to DPR's mandate, stated in FAC section 12824, to endeavor to eliminate from use any pesticide that endangers the environment. DPR does not necessarily equate unsubstantiated violations of water quality standards with environmental endangerment. We recommend that you delete from this sentence the phrase that begins with "such as"

Page A-7, paragraph 1, sentence 3: The meaning and context of this sentence is unclear. Did you mean uncontrollable adverse effects? ("Uncontrollable" is a term used in FAC section 12825, which gives DPR the authority to cancel registrations of products that has demonstrated significant uncontrollable adverse effects.)

Page A-8, paragraph 1: DPR supports the implementation strategy's concepts of how the Regional Board and DPR can cooperate during investigations of pesticides that cause violations, or that have a reasonable likelihood of causing future violations, of water quality standards. Please recognize that DPR's ability to fully participate in these investigations will depend on the number and complexity of Regional Board notifications, as well as DPR's available resources.

Thank you for your consideration of our comments. We appreciate the several opportunities you afforded DPR to consult during the development of the staff report and implementation plan. We look forward to continuing our cooperative relationship as we proceed into the implementation phase of this effort. If you have any questions on our comments, please contact Marshall Lee, of my staff, at (916) 324-4269 or <mlee@cdpr.ca.gov> or Nan Singhasemanon, of my staff, at (916) 324-4122 or <nsinghasemanon@cdpr.ca.gov>.

cc: Marshall Lee, DPR Senior Environmental Research Scientist
Nan Singhasemanon, DPR Management Agency Agreement (MAA) Coordinator
Syed Ali, State Water Resources Control Board MAA Coordinator

September 19, 2005

Bill Johnson
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

RE: Proposed Basin Plan Amendment for Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks

Dear Bill:

These comments are respectfully submitted into the record on behalf of Baykeeper, Pesticide Action Network, and Clean Water Action and our thousands of Bay Area members (hereinafter “Baykeeper”) as part of the public comment period for the Diazinon and Pesticide-Related Toxicity TMDL and Basin Plan Amendment for Bay Area Urban Creeks (“BPA”).

I would like to begin by thanking staff for the efforts you have undertaken to develop this BPA. The public process has been a significant improvement over our experience with some of the Regional Board’s past processes. Staff provided draft documents and input opportunities early in the development process, prior to peer review, and Baykeeper participated to the full extent feasible. Staff listened to Baykeeper’s comments, and in some instances, Baykeeper’s recommended suggestions were incorporated. I urge the Regional Board to continue to develop future TMDLs and regulations in a similar manner and suggest that in the future, the development of these regulations also include opportunities for meaningful exchange of ideas and consensus building between the interested parties prior to issuance of a public review draft.

While Baykeeper applauds some parts of this Basin Plan Amendment, the BPA lacks a few critical components that are essential to meaningful implementation and attainment of the no pesticide toxicity targets. Baykeeper urges staff to make at least the following changes before adopting this TMDL and Basin Plan Amendment (these revisions are described in more detail in the following pages and specific language is suggested where possible):

- Explicitly address new evidence of pesticide toxicity in creek sediments
- Require meaningful actions for Urban Runoff Agencies
- Remove shield for Urban Runoff Agencies
- Require compliance with non-stormwater discharge prohibition
- Require specific actions using Water Board authority
- Revise adaptive implementation to be a continuous and interactive process

I. Explicitly address new evidence of pesticide-related toxicity in creek sediments

Diazinon poses a serious threat to water quality, non-target organisms, and human health. In recognition of this threat, US EPA began a gradual phase out, which terminated in a ban on the sale of diazinon-containing products for residential use. The Basin Plan Amendment, if it had focused simply on diazinon impairment of Bay Area urban creeks, would have failed to provide any meaningful control on the next generation of pesticides. Instead, the BPA commendably recognizes the need to stop the pesticide replacement cycle by focusing on pesticide-related toxicity. Baykeeper endorses this approach, as well as the application of the BPA to all Bay Area creeks that have the potential for pesticide-related impairment. Because TMDLs are the very last line of defense to protect our waterways, they must be especially protective. More important, though, is the need for improved control measures so that our waterways do not require state-of-emergency TMDL assistance for every pesticide that replaces diazinon in the future.

Unfortunately, the BPA does not go far enough to end the pesticide replacement cycle. We are already beginning to find diazinon-replacement products, such as pyrethroids, in our Bay Area waters. Researchers at the University of California, Berkeley recently found widespread toxicity in the sediments of East Bay urban creeks. According to the researchers, five of seven creeks sampled were toxic to the amphipod *Hyaella azteca* on at least one occasion. Of the total samples taken, eight of the fifteen were toxic, and in seven of the eight toxic samples, the toxicity could be explained by the presence of pyrethroids. For example, sediments in Kirker Creek in Contra Costa County were toxic and contained pyrethroids on all three occasions sampled. (Amweg, Erin, and Don Weston. "Monitoring for Pyrethroid Pesticides and Sediment Toxicity in Urban Creeks," presentation to the Urban Pesticide Committee, July 19, 2005.)

If we use diazinon as an indicative model for what to expect for pyrethroids, it will take years for U.S. EPA or the California Department of Pesticide Regulation to review the water quality data and additional years for either of these agencies to break through bureaucratic inertia and confront the pesticide manufacturing lobby to adequately implement restrictions. Thus the local agencies and the Water Board will have evidence of toxicity for years, yet under the old model – codified in the Basin Plan Amendment – they will sit by for other agencies to take action while creeks become more toxic and the beneficial uses of the waters are further harmed.

The Basin Plan Amendment only includes an expression of intent to study the problem further, but it fails to include a credible plan to eliminate actual and potential sources of pyrethroids to urban creeks.

Suggested Revision

The language in the BPA should explain how actions in the Basin Plan will eliminate these new sources of toxicity in creeks.

At a minimum, the Basin Plan should specifically require educational materials regarding pyrethroids and water toxicity to be made available in prominent locations at all retail outlets that sell home and garden chemicals. Urban Runoff agencies might also be asked to send residential consumers fliers to make them aware that chemical methods for outdoor pest control are poisoning our waterways and suggesting non-chemical alternatives. Pyrethroid-containing products should be mentioned specifically and new products known to be problematic could be added to the list as they come into use. Retail stores and Urban Runoff agencies can use existing educational materials with alternative pest control strategies, which have already been created by a number of entities, including the Water Boards, Marin County Storm Water Pollution Prevention Project, and DPR.

Additionally, Baykeeper has suggested other revisions that better support Integrated Pest Management (“IPM”) in the sections below, and these revisions could also be used to address our concern regarding the disconnect between the actions in the proposed Basin Plan Amendment and new evidence of toxicity.

II. Require meaningful actions for Urban Runoff Agencies

a. Remove shield

The law requires water quality standards to be met: A stated goal of the Clean Water Act permitting program is to achieve water quality standards by restoring and maintaining the “chemical, physical, and biological integrity” of the nation’s waters. CWA 33 U.S.C. § 1251(a). Congress even went so far as to state “it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited.” *Id.* With regard to the TMDL program, this intent is delineated through 40 CFR § 122.44(d)(1): “Achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality.” Section 122.44(d)(1)(i) describes this requirement in further detail: “Limitations must control all pollutants or pollutant parameters...which...are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.”

Baykeeper also believes that the law requires numeric effluent limits: “When the permitting authority determines...that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of a State numeric criteria within a state water quality standard for an individual pollutant, the permit must contain effluent limits for that pollutant.” 40 CFR § 122.44(d)(1)(iii).

But the Basin Plan Amendment does not require compliance with water quality standards, nor does it contain numeric effluent limits. Instead, the BPA provides a shield for Urban Runoff agencies, allowing one of the largest sources of pesticide toxicity in urban creeks to continue without additional control efforts. Baykeeper opposes such bad policy.

In an earlier draft of this plan, staff included a shield for Urban Runoff which stated “an urban runoff management agency that complies with these permit requirements shall be deemed to be in compliance with receiving water limitations relative to pesticides...” Discussion draft at page A-11. Baykeeper strenuously opposed this language. It is factually untrue to say that dischargers are “in compliance” with water quality standards if water quality limits are in fact not met, no matter what actions the agencies have taken. If water quality limits are not met, then the standards have not been attained and the water body is still impaired. This sentence was modified in the new version of the BPA, but it is no better. The new sentence advances exactly the same illogical policy: “Urban runoff management agencies’ and similar entities’ respective responsibilities for addressing [i.e., meeting] these allocations and targets will be satisfied by complying with the requirements set forth below.” BPA at A-10.

Baykeeper believes the shield is inappropriate in a permit, and it is especially inappropriate in the Basin Plan because it undermines the Regional Board’s ability to adaptively manage. If water quality has not been improved, then Urban Runoff agencies should be required to take additional measures to try to solve the problem. Instead the BPA claims that many of the requirements that are “set forth” are “already in some [NPDES] permits.” BPA at A-5. So the BPA does not require many of the agencies to do anything more than what they are already doing, yet they will be in compliance with the TMDL requirements even though water quality is still impaired.

Best Management Practices, standards, and control measures will change and improve over time. At the very least, the BPA should allow for permits to require an iterative approach to implement new measures until standards are met.

Suggested Revision

The above-mentioned sentence and all similar shields should be removed from the proposed BPA language. Instead Urban Runoff agencies should be required to devise and implement additional new measures until water quality standards are achieved. This TMDL cannot serve as the TMDL for all future pesticide toxicity unless and until it contains real requirements for Urban runoff agencies to take meaningful measures to eliminate pesticide toxicity (see section II (d)(ii) below for examples of what more can be done).

If the Water Board insists on keeping this type of sentence in the BPA, it should be revised to read:

“It is believed that Urban Runoff management agencies and similar entities will be able to address these allocations and targets by complying with the requirements set forth below and as further incorporated in their permits. If these allocations and targets are not met, the Regional Board shall require additional control measures through adaptive implementation until water quality standards are attained.”

b. Require at least status quo, if not more

Baykeeper's main criticism of this proposed Basin Plan Amendment is that it requires *less* than what is already required of the dischargers. For example, Santa Clara developed a pesticide control program in response to Provision C.9(d) of their stormwater permit. The program requires educational outreach, training programs, and IPM use on public property. These are all actions required generally in the BPA. However, the Santa Clara program goes farther by contemplating the inclusion of school districts, the discouragement of pesticide use on new developments, and the recognition of least toxic pest control operators, among other actions. *See* Santa Clara Valley Urban Runoff Pollution Prevention Program, Final Pest Management Performance Standard and Guidance Documents approved February 2002.

The requirements laid out in the BPA do not seem to allow the Urban Runoff agencies to go this far. It may also be noteworthy to point out here that in spite of existing programs, like that of Santa Clara, pesticide toxicity is still occurring. Therefore, what is being done by the most active programs now may turn out to be inadequate to protect water quality, hence the need to remove the shield as described in greater detail above.

If pesticide toxicity is to be curbed, the BPA should at least identify the full range of pesticide control activities currently required of the most active Urban Runoff agencies. Rather than do that, the BPA only identifies municipal maintenance activities, outreach and education, monitoring, and coordination with other entities, completely ignoring other actions many of the agencies are already required and willing to take.

Suggested Revision

One example of requirements that the BPA is missing includes existing requirements in urban runoff permits. An example of these missing requirements would be some of the actions being taken by the Santa Clara program described above. The BPA should at least be revised to include existing pesticide control requirements from the most active stormwater programs. The BPA should also contemplate changing future permits to require written records for why an Urban Runoff agency chose not implement least toxic alternatives in spite of established IPM programs.

Existing permits also require pollutant source control actions for new development and redevelopment projects. The source control measures "shall, as part of their continuous improvement process...summarize source control requirements for projects to limit pollutant generation, discharge, and runoff..." Contra Costa Countywide NPDES Permit Amendment, Order No. R2-2003-0022 (k). The permit specifically includes measures such as "landscaping that minimizes irrigation and runoff, promotes surface infiltration where appropriate, *minimizes the use of pesticides and fertilizers*, and where feasible removes pollutants from stormwater runoff." *Id* (k)(vii) (emphasis added). This requirement and such pesticide toxicity control measures should be codified in this BPA so that future permits uniformly require these types of source control activities on these sites.

The BPA also fails to fully codify activities required in U.S. EPA regulations. The BPA should incorporate at least the minimum pesticide control activities that the U.S. EPA stormwater regulations specifically require urban runoff agencies to include in their management plans. According to the regulations, for example, municipal stormwater permits must include a program to reduce pollutant discharges in storm sewers “associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, *permits, certifications and other measures for commercial applicators and distributors*, and controls for application in public right-of-ways and at municipal facilities.”

40 CFR § 122.26(d)(2)(iv)(A)(6) (emphasis added). Under this language, Urban Runoff agencies could require local agencies such as school districts, to implement Integrated Pest Management (“IPM”) ordinances. Additionally, County Agricultural Commissioners and Pest Control Operators could be required to institute permit or certification programs that would promote IPM for residential use.

These types of revisions would help improve the BPA strategy from the less-than-status-quo approach it is currently taking to an approach that incorporates at least the status quo with regard to urban runoff management.

c. Require enforcement of non-stormwater discharges

The Clean Water Act requires U.S. EPA through the states to set standards to regulate discharges into the nation’s surface waters. Under the Clean Water Act, municipal stormwater permits must effectively prohibit non-stormwater discharges to storm sewers. CWA § 402(p)(3)(B)(ii). Illicit discharges are defined as “any discharge to a municipal separate storm sewer that is not composed entirely of storm water...” 40 CFR § 122.26(b)(2). Permitting regulations for stormwater contain detailed provisions requiring, as part of the application procedure, municipalities to characterize illicit discharges into the storm drain system. 40 CFR 122.26(d)(1)(iv)(D) requires a “field screening analysis” for illicit connections and illegal dumping, including field sampling at least 500 major outfalls. Section 122.26(d)(1)(v)(B) requires permit applications to contain a description of the existing program to identify illicit connections to the municipal system. And the regulations require permit programs to include “inspection procedures and methods for detecting and preventing illicit discharges, and describe areas where this program has been implemented.” Moreover, section 122.26(d)(2)(iv)(B) requires a description of a program involving a schedule to detect and remove illicit discharges and improper disposal into the storm drain.

Urban Runoff agencies should enforce the Clean Water Act’s strict prohibition on non-stormwater discharges to storm drain systems. This CWA prohibition includes the placement of pesticides or other toxic materials on building exteriors, walkways, and other impervious surfaces such that they could be washed or carried by runoff into the storm drain system. Enhanced enforcement of this prohibition has to be part of the BPA implementation strategy, if the BPA is to comply with federal requirements.

Suggested Revision

The BPA should codify the prohibition of non-stormwater discharges, including the application of pesticides to exterior impervious surfaces connected to storm drains, and should require Urban Runoff agencies to develop robust programs to detect and remove illicit discharges and improper disposal into the storm drains.

Educational and outreach programs should be required to include warnings regarding the non-stormwater discharge prohibition, including its applicability to pesticide applications.

Additionally, agencies should be required to develop a plan to enforce the discharge prohibition, with specific attention to pesticide applications.

II. Require specific actions using Water Board authority: Water Board has the authority to regulate pesticides and should do so through NPDES permits and by other means

a. Water Board has authority

Section 11501.1 of the California Food and Agricultural Code has been cited as a barrier to local control and regulation of pesticides. This legislative barrier has prevented local cities from regulating the sale and use of pesticides, even when the applications are resulting in localized effects, such as aquatic toxicity in neighborhood creeks and ponds. While this restriction may have been the result of the California legislature's determination that pesticide use and regulation is an area of state-wide concern, the regulation does not reasonably intend for local agencies to be entirely unable to protect public health or local waterways. Thus the regulation expressly provides that "[n]either this division nor Division 7...is a limitation on the authority of a state agency or department to enforce or administer any law that the agency or department is authorized or required to enforce or administer." Cal. Food & Ag. Code § 11501.1(c).

The State Board "shares authority for implementation of the federal Clean Water Act and the state Porter-Cologne Act with the Regional Boards." Water Quality Control Plan for the San Francisco Bay Basin at 10. The Regional Board is a state agency authorized by federal law and Congress to enforce the Clean Water Act, and therefore the Board is not limited by § 11501.1. Rather the delegation of authority to implement the Clean Water Act requires the Board to fully adopt and implement regulations under the Clean Water Act in order to protect the region's water quality.

The Porter-Cologne Water Quality Control Act of 1969 expressly states the intent that State and Regional Water Boards "shall be the principle state agencies with primary responsibility for the coordination and control of water quality." 7 Cal. Water Code § 13001. Therefore, while the California Food & Ag Code may also vest the Department of Pesticide Regulation ("DPR") with authority to protect water quality, the Water Boards have the primary authority and responsibility to protect water quality under both Federal and California law.

Suggested Revision

A few clear findings in the Basin Plan Amendment would help provide the context for the Water Board's authority, and Baykeeper suggests staff consider incorporating the following findings:

"This TMDL is being promulgated by a state agency pursuant to the federal TMDL program, and the resulting restrictions on stormwater agencies are issued under the federal NPDES program."

"As is evidenced from impairment in Bay Area urban creeks and San Francisco Bay, FIFRA labeling requirements do not protect water quality."

"Based on the findings above, the Water Board has the authority to take specific actions to ensure reversal of toxic impairment due to pesticides in urban creeks."

b. Water Board should not cede this authority

Baykeeper strongly agrees with the BPA language stating that the Water Board "could consider the need to use its own regulatory authorities to control pesticides discharges," if DPR does not act. BPA at A-9. This strategy to restrict the use of potentially harmful pesticides is promising. However, the TMDL is unclear as to the Water Board's plan if DPR is not doing its job.

Failure by the Water Board to fulfill the responsibility to implement and enforce the Clean Water Act would be considered a breach of the federal delegation of authority and, in this case, the NPDES program under section 402. By leaving the primary decision making regarding pesticide toxicity in the watershed up to the California Department of Pesticide Regulation, the BPA inappropriately cedes this federal authority to another state agency. Therefore the bigger question may be whether or not the Water Board has shirked a federally authorized obligation, thereby requiring federal EPA to step in.

Suggested Revision

The BPA should contain an additional paragraph on page A-9 that elaborates on the Water Board's authority and action plan if DPR does not act. This paragraph should answer the following questions: How long is too long to wait for DPR to act? What triggers a decision that DPR is not doing its job? What does the Water Board plan to do upon a determination that DPR is not acting in a sufficient manner to protect and improve water quality in urban creeks?

Additionally, the Water Board should clearly identify interim actions that will be taken after it notifies DPR that water quality is being or has the potential to be impaired by a pesticide. These actions can include raising a warning flag for local agencies, requiring additional control measures specific to the pesticide of concern, researching and suggesting alternatives or categorical controls (e.g., ant control measures), and restricting use of certain pesticides with potential to cause toxicity on local agency and public properties. These types of immediate

interim actions should be delineated in the BPA, and the Water Board should commit to taking these types of steps if toxicity is suspected.

c. Water Board can take concrete actions to use its authority

Staff has generated a list of potential regulatory actions that it can take. Staff Report at 111. As staff recognizes, it may be necessary to implement many or all of these options in order to decrease and prevent pesticide toxicity in Bay Area creeks: “Without regulatory action, however, water quality impairment would likely be a recurring problem for Bay Area urban creeks.” *Id.* But staff stops short by dismissing the Water Board’s ability to fully use its authority by saying that these actions are inefficient, expensive, and unenforceable. *Id.* This policy decision serves to dismiss the Water Board’s ability to fully use its authority, and creates unnecessary and unsubstantiated barriers on protecting water quality.

Baykeeper does not share staff’s belief that employing these options would pose substantial enforcement challenges. If communication between the Water Board and DPR is prioritized, many or all obstacles can be avoided. Additionally, the regulatory actions do not have to be all or nothing, as implied in the Staff Report. The adoption of a few of the programs when necessary, rather than all of them at the same time, could go a long way towards water quality protection, and these actions would undoubtedly pose few obstacles if taken one at a time.

Only aggressive regulation of pesticides and pesticide application will enable water quality objectives to be achieved, therefore the Water Board should be prepared to take action as well as work collaboratively with DPR and all other agencies in addressing pesticide toxicity in creeks.

Suggested Revision

Baykeeper believes it is critical that the Board do as much as possible to gather information about pesticide use and its affects on water quality by initiating water quality evaluations of pesticides and by filling information gaps by requesting such information from all potential sources, including pesticide manufacturers, applicators, and DPR.

In addition to information gathering, however, the Board should be prepared to exercise its regulatory powers at the same time as, or in conjunction with DPR. This would include restricting the use of pesticides that do or may threaten water quality until they are no longer a threat to water quality, placing regulatory/contractual controls on pest control professionals, banning sales or applications of pesticides within the San Francisco Bay area, incorporating best management practices into permits and Waste Discharge Requirements, and requiring local agencies, school districts, County agricultural commissioners and Pest Control Operators to adopt and implement robust IPM ordinances and certification programs.

The Water Board can and should also set aggressive guidelines as to what constitutes IPM. There are too many agencies and applicators who claim to be doing IPM, but because they follow more lax models or automatically claim that pesticide-use is necessary, they do not actually result in meaningful and holistic pest control assessment and least toxic controls. By

setting forth strict guidelines in the Basin Plan Amendment, every local agency, pest control operator, and certification program will be on the same level playing field. This revision could easily be made by modifying Table 10.1 on page 80 of the Staff Report and including this type of table in the BPA with language about how the IPM program should be adaptively managed to ensure up to date control measures and considerations. The Water Board should also include requirements to review and enforce these IPM programs as necessary.

- d. Water Board can and should require NPDES permittees to restrict pesticides where they impact local water quality
 - i. Section 11501.1 does not limit the Water Board, and federal law preempts any limitation on local agencies implementing Water Board requirements pursuant to federal law

In response to a 1984 state Supreme Court decision that upheld a local government's right to regulate pesticides, the California legislature amended the state code to limit local regulation of pesticides. Cal. Food & Ag. Code § 11501.1. A prohibition on local regulation of pesticides that are harming water quality, however, conflicts with the federal Clean Water Act. Therefore, when regulation of pesticides is required by the Water Board to carry out the purposes of the federal Clean Water Act, the Food and Ag. Code allows for the Water Board to do so: "[n]either this division nor Division 7...is a limitation on the authority of a state agency or department to enforce or administer any law that the agency or department is authorized or required to enforce or administer." Cal. Food & Ag. Code § 11501.1(c).

The law of preemption requires the federal Clean Water Act to be prioritized ahead of a California Code provision. Pursuant to the Supremacy Clause of the United States Constitution, art. VI, cl. 2, all state or local laws that interfere with or are contrary to federal law are preempted. *Hillsborough Co. v. Automated Medical Labs, Inc.*, 471 U.S. 707, 713 (1985), *Wisconsin Pub. Intervenor v. Mortier*, 501 U.S. 597, 604 (1991). Preemption of state law can be either express or implied. State laws are impliedly preempted when the federal regulatory scheme is so "pervasive" that it demonstrates Congress' intent to completely occupy a field. *Id.* In the absence of express or implied preemption, a state law will still be invalid to the extent that it "actually conflicts with a . . . federal statute." *Ray v. Atlantic Richfield Co.*, 435 U.S. 151, 158 (1978). Such a conflict will be found when "compliance with both federal and state regulations is a physical impossibility," *Florida Lime & Avocado Growers, Inc. v. Paul*, 373 U.S. 132, 142-143 (1963), or when a state law "stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress." *Hines v. Davidowitz*, 312 U.S. 52 (1941). See also *Hillsborough* 471 U.S. at 713; *Pharm. Research & Mfrs. of Am. v. Walsh*, 538 U.S. 644, 679 (2003) (obstacle preemption turns on whether the goals of the federal statute are frustrated by the effect of the state law).

According to the U.S. Supreme Court, the savings clause of the Clean Water Act demonstrates that Congress did not intend to expressly preempt all state laws affecting water pollution. *Int'l Paper Co. v. Ouellette*, 479 U.S. 481, 492 (1987). Thus, on its face, section 11501.1 is not invalidated simply on the grounds that the Clean Water Act preempts state laws respecting water

pollution. In the absence of express preemption, however, section 11501.1 is invalid if it prevents compliance with the Clean Water Act or if it stands as an obstacle to the execution of the Act's purposes and objectives. *See supra, Hines et al.*

The Clean Water Act gives the Water Board power to condition permits and certifications on conditions necessary to achieve the goals of the Act. *See* § 1342(a)(1), § 1341(a)(2). Thus, if necessary, the Water Boards may condition the issuance of a permit on the permit holder's agreement to regulate uses of a pollutant that are impairing a local water body. If the impairing pollutant is a pesticide, then section 11501.1 would prevent the permit holder from complying with the terms of the permit, thereby creating conflict with compliance of both section 11501 and the Clean Water Act. Prohibiting local regulation of pesticides when those pesticides are impairing local waters, however, frustrates the most fundamental purpose of the Clean Water Act because, in many cases, regulation may be the only way to clean up those waters. Therefore a reading of section 11501.1 to prevent local regulation of pesticides when that regulation is either required by the Water Board or necessary to achieve water quality objectives clearly conflicts with the Clean Water Act and is thus preempted by federal law.

- ii. Federal regulations require Urban Runoff agencies to have authority to pass ordinances to reduce illicit discharges

The Basin Plan Amendment should require NPDES permit language to provide proper authority to local agencies to fulfill federal obligations. "All state programs under this part must have legal authority to implement each of the following provisions and must be administered in conformance with each except that states are not precluded from omitting or modifying any provisions to impose more stringent requirements." 40 CFR § 123.25(9) (storm water discharges). Permittees are required to have legal authority to "prohibit through ordinance, order, or similar means, illicit discharges to the municipal storm sewer system" and permittees must be required to comply with and enforce these conditions. 40 CFR § 122.26(d)(2)(1)(B).

If legal authority is "not sufficient to meet the criteria...the [permittee] shall list additional authorities" that will be needed to meet the criteria and shall include a "schedule and commitment to retain such additional authority." 40 CFR § 122.26(d)(1)(ii).

Suggested Revision

Baykeeper agrees that residential use of pesticides presents a real challenge to the achievement of water quality standards for urban creeks. We also acknowledge the Urban Runoff agencies' fear at challenging the state limitation on local control of pesticides. These challenges and fears, however, should not prevent Water Board and Urban Runoff agencies from taking additional aggressive measures to regulate pesticides.

Under the Food and Ag Code § 11501.1, local agencies' power to regulate pesticide use extends to public property. Urban Runoff agencies can and should be required to regulate the application of pesticides to public land by banning those pesticides that have the potential to threaten water quality and by requiring all of their contracted pesticide applicators to employ IPM. And if it has

not yet done so, all local agencies should adopt strict IPM ordinances for their own public properties.

Additionally, local governments should undertake studies of pesticide use and effects in their jurisdiction and use that information to craft more complete IPM ordinances for the city and to educate citizens. Once residents learn that their City Council is refusing to use a certain toxic chemical on public property, they may think twice about using these chemicals on their own property.

In addition to regulating pesticide use on public land, the Water Board can also require Urban Runoff agencies to take steps to address pesticide use on private land. For example, all commercial landowners who require commercial applications of pesticides on their property could be required under zoning and land use ordinances to implement IPM plans. And both commercial and residential applicators could be required to provide advance notice to the city and to persons who might be affected by the pesticide applications. These types of requirements, which do not prevent the sale or use of pesticides, do not rise to the level of state-wide pesticide regulation and therefore are permissible under California code.

III. Revise adaptive implementation to be a continuous and interactive process

Adaptive Implementation should be revised to allow for continuous improvements, the need for which can be triggered by information gathered or provided by interested parties. Review by the Water Board every five years does not allow for rapid and continuous response to evolving data. The Water Board and local agencies should be able to address and adapt their implementation programs and management plans within a fluid timeframe, and as quickly as necessary to prevent aquatic toxicity.

The Urban Runoff agencies are already committed to continuous improvement of their control actions. This continuous improvement process should be incorporated into the adaptive management strategy of the BPA. If other agencies do not appropriately respond to monitoring data and other evidence provided, NPDES permits should include time sensitive triggers, which require local agencies to take further actions, including implementing additional BMPs and/or source control measures to address harms caused to local water bodies.

Suggested Revision

The language in adaptive implementation should be revised to allow review and revision at the request of an interested party or local agency based on substantial new information.

Additionally, the language should be improved to trigger and require Urban Runoff and other responsible agencies to take interim actions when new information is collected.

IV. Conclusion

Baykeeper believes the changes we have requested herein are reasonable and necessary in light of the spirit and letter of the Clean Water Act. Moreover, we have attempted to provide specific suggestions for revisions where possible, in order to demonstrate that the changes we are requesting are completely feasible and warranted.

If Staff should have questions or be inclined not to incorporate the revisions we have suggested, Baykeeper would appreciate an open dialogue that may include other interested parties to determine how these concerns will be addressed otherwise.

Thank you for this opportunity and for your consideration of Baykeeper's comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'Sejal Choksi', is written over a light blue rectangular background.

Sejal Choksi
Baykeeper
Director, SF Bay Chapter

Susan Kegley, Ph.D.
Senior Scientist/Program Coordinator
Pesticide Action Network

Andria Ventura
Environmental Health Organizer
Clean Water Action

Alameda Countywide
Clean Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Stormwater Pollution
Prevention Program

Santa Clara Valley
Urban Runoff Pollution
Prevention Program

Vallejo
Sanitation and Flood
Control District



B A S M A A

September 19, 2005

Bill Johnson

California Regional Water Quality Control Board

San Francisco Bay Region

1515 Clay Street, Suite 1400

Oakland, CA 94612

Dear Bill:

Subject: Comments on the Diazinon and Pesticide-related Toxicity in Bay Area
Urban Creeks Water Quality Attainment Strategy and TMDL Staff
Report and Proposed Basin Plan Amendment

This letter and the attached comments are submitted by the Bay Area Stormwater Management Agencies Association (BASMAA) on behalf of member Bay Area stormwater management agencies in response to the invitation to submit comments on the subject report ("Report" for ease of reference) dated August 5, 2005. As you know, BASMAA and its member agencies have been intimately involved in the effort to identify and characterize the sources of and develop solutions to the problem of pesticide-related toxicity in Bay Area urban creeks for over ten years. We request that this letter, the attached comments, and all previous documents and communications submitted with respect to this matter be included in this hearing record.

We commend the effort that you and other Regional Water Board staff have invested over many years to deal with this difficult issue. We especially appreciate the recognition that although pesticides may be discharged from municipal storm drain systems, municipalities are by and large not the source of these pesticides. In addition, you have acknowledged that municipalities are expressly prohibited by the Food and Agriculture Code (Section 11505.1) from regulating the registration, sale, transportation, or use of pesticides. The Report also correctly points out that the source of the previously identified pesticide-related toxicity was the application of pesticides in accordance with label directions as authorized by the California Department of Pesticide Regulation.

It is clear from the Report and from our experience that the existing Federal and State pesticide registration processes do not prevent water quality problems from occurring and are very slow to correct problems after they have occurred. While we strongly support the actions proposed in the Report for the U.S. Environmental Protection Agency, Department of Pesticide Regulation, the Structural Pest Control Board, private entities, and others we are concerned that these actions may not be fully implemented and as a consequence municipalities will be required, through NPDES permits, to expend significant resources attempting to mitigate an impact over which they have very little control.

Bay Area

Stormwater Management

Agencies Association

1515 Clay Street

Suite 1400

Oakland, CA 94612

510.622.2326

www.basmaa.org

BASMAA Comments on the Diazinon and Pesticide-related Toxicity in Bay Area Urban Creeks
Water Quality Attainment Strategy and TMDL Staff Report and Proposed Basin Plan Amendment

For this reason and those concerns described in the attachments to this letter, BASMAA requests that the Regional Water Board postpone the adoption of these policies (TMDL and WQAS) and revise the proposed Staff Report and Basin Plan Amendment to adequately address stakeholder concerns.

Thank you again for this opportunity to comment on the Report. We look forward to continuing to work with you on this issue. Please contact me at (925) 313-2373, Jim Scanlin (510) 670-6548, or Geoff Brosseau (510) 622-2326 if you have any questions regarding the comments or suggested changes.

Sincerely,

A handwritten signature in black ink, appearing to read "Donald P. Freitas". The signature is fluid and cursive, with a large loop at the end.

Donald P. Freitas
BASMAA Executive Board Chair

Attachments: Additional BASMAA comments

cc: Jim Scanlin, ACCWP / CEP Diazinon Work Group
Geoff Brosseau, BASMAA
Arleen Feng, BASMAA Monitoring Committee / CEP Technical Committee
BASMAA Executive Board

General Comments:

1) Clearly separate the TMDL from the Water Quality Attainment Strategy

BASMAA has commented on this issue in its letter of April 12, 2004 (attached) and submitted a markup of a previous draft of the proposed Basin Plan amendment (dated 3/16/2005, attached) that addressed this issue. The Report combines the TMDL and the pesticide-related toxicity water quality attainment strategy (WQAS). In addition, the TMDL is for both diazinon and pesticide-related activity. In the Bay Area, 37 urban creeks appear on the Clean Water Act §303(d) list due to pesticide-related toxicity attributed to diazinon. This listing does not apply to all pesticide-related activity, but specifically to pesticide-related activity attributed to diazinon. Insufficient data has been presented to apply the TMDL to all pesticide-related toxicity. Intermingling of the TMDL and WQAS leads to unnecessary ambiguity, particularly in the implementation section where it is not clear which activities relate to the TMDL versus the WQAS. It also leads to inappropriate assumptions. Some of the implementation actions, for example, only assigning an allocation to stormwater dischargers, appear to be based on the assumption that the sources and pathways of future pesticide-related toxicity in urban streams will be similar to the sources and pathways of diazinon related toxicity. This assumption is not supported by evidence in the Board record and is therefore improper. As you know, new pesticides are constantly being brought to market and gaining market share while others are losing market share. We cannot predict what the pesticide market will look like in ten or twenty years, what the physical properties of those pesticides will be, or which applications may be causing water quality impacts. We therefore recommend and request that the TMDL apply only to diazinon and that the TMDL and the WQAS be developed as two separate policies.

2) Separate the Implementation Plan from the TMDL

Neither the Clean Water Act nor the U.S. Environmental Protection Agency's (USEPA) regulations require the State Water Board or the Regional Water Boards to seek USEPA approval of TMDL implementation plans. TMDL implementation is instead largely a function of state law. By combining the TMDL and the Implementation Plan, the Report blurs this distinction, and thereby will likely undermine the State's authority and flexibility with regard to TMDL implementation. The Regional Water Board should instead, separate the establishment of the "technical" TMDL (*i.e.*, the calculation of acceptable loading and allocations) from the development of TMDL implementation policies, actions, and schedules.

Stormwater agencies have generally been supportive of linking implementation planning with TMDL development, however by formally mixing the process of establishing (developing and approving) TMDLs with the process of developing TMDL implementation plans in one Basin Plan amendment process, the Regional Water Board effectively risks ceding substantial State authority and discretion to the federal government. Therefore, in order to maintain the flexibility and independence for the Regional Water Board to implement the TMDL in accordance with the considerations required by the Porter Cologne Act, the Regional Water Board should separate the process into two parallel stages and

documents, developing the “technical” TMDL and submitting it to USEPA for approval, and developing the TMDL implementation plan in a separate step of the process in which USEPA approval is not required. Separating the “technical” TMDL from the implementation plan would also help to eliminate some of the ambiguity discussed above in comment number one.

Specific Comments on Proposed Basin Plan Amendment

3) Page A-1, paragraph 3: Replace “Compliance with the objective” with “Achievement of” or “Maintenance of” the objective.

As the objectives govern the concentration of pollutants “in the main water mass,” “achievement” or “maintenance” of the objective is more appropriate. Further, we believe that it is inappropriate to discuss compliance determinations in Chapter 3 of the Basin Plan as that chapter addresses standards and water quality objectives. Chapter 4 of the Basin Plan addresses implementation, which is more directly relevant to compliance determinations. All compliance related language should be included in Chapter 4.

4) Page A-2, paragraph 1, last sentence: After “to all San Francisco Bay Region urban creeks,” add “listed in the Basin Plan.”

The Regional Water Board is planning to update the list of creeks in the Basin Plan. Once updated, the Basin Plan list should be the appropriate list of creeks for the WQAS. This will avoid confusion regarding the application of the WQAS.

5) Page A-3, Diazinon section: Diazinon target should be consistent with the State’s 303(d) Listing Policy.

That is, the determination of impairment should consider the number of samples analyzed. The previous draft of the Basin Plan amendment contained the language that the concentration shall not exceed the target “more that once every three years.” This “once ever three year” flexibility should be included as it allows for possible sampling errors or non-representative occurrences.

6) Page A-4, Allocations:

Allocations should be to all potential sources including non-point sources. Also, the first sentence should be revised to read “urban storm runoff” rather than “urban storm drains.” It is possible that there will be a non-point source discharger (for example, a nursery) within an urban area, and this allocation should apply to that source as well. The State Water Board in its adoption of Resolution No. 2005-0060 with respect to the mercury TMDL has clearly indicated that the Regional Water Board should be addressing 303(d) listed pollutants in an integrated and comprehensive manner. Thus, addressing all sources is essential in order to address all discharges and be consistent with State Water Board policy.

7) Page A-4, Implementation, 1st paragraph:

Insert “Diazinon TMDL implementation will occur automatically as a function of the 2004 USEPA phase-out of urban diazinon applications. Since diazinon will no longer be available for purchase in urban areas, existing stocks will be depleted within a relatively short period of time and further use will be terminated.”

8) Page A-5, Implementation, 2nd full paragraph:

- a) We support the recognition that many entities share responsibility for pesticide related toxicity.
- b) 2nd sentence: Again, replace “urban storm drain” with “urban runoff.”
- c) 2nd to last sentence: Insert “and by other regulatory actions as necessary” after “incorporated into all applicable NPDES permits when the permits are reissued.”

9) Page A-5, Water Board Actions:

We appreciate and support the proposed actions of the Regional Water Board.

10) Page A-6 & 7, California Department of Regulation Actions:

We appreciate and support the requirements for the California Department of Pesticide Regulation. As we mentioned in our cover letter, the success of this WQAS depends upon the cooperation of the California DPR.

11) Page A-8, 1st set of bulleted items:

Insert 5th bullet “Select pesticides for further evaluation based on their chemical and physical properties, toxicological properties, and sites of use, and convey this information to the California Department of Pesticide Regulation.” This would further encourage an integrated and well-coordinated effort among the State agencies.

12) Page A-10, University of California Actions:

We support the inclusion of these actions.

13) Page A-10 to 12: Insert a “Mosquito Abatement Districts / Vector Control Districts” section

Mosquito abatement and vector control districts do not come under the authority of municipalities. These districts routinely apply pesticides throughout the urban environment, often directly into storm drains. Due to the threat of West Nile Virus, mosquito abatement and vector control districts are conducting widespread applications of pyrethroids in some parts of the Bay Area. In spite of the politically sensitive nature of regulating mosquito

abatement and vector control districts, they should be included in the WQAS. Therefore, we recommend inserting the following section:

“Mosquito Abatement Districts / Vector Control Districts Actions

Mosquito Abatement Districts / Vector Control Districts are public health agencies that protect the public health by preventing the transmission of diseases. To fulfill this mission, these agencies may need to apply pesticides, either directly to surface waters or indirectly to areas adjacent to or that discharge to surface waters. Mosquito Abatement Districts / Vector Control Districts should implement the following actions:

- Continue to apply aquatic pesticides for vector control in accordance with applicable NPDES permit(s);
- Continue to use integrated pest management and less-toxic pest control – consistent with protecting public health;
- Continue to report pesticide uses as required by the California Department of Pesticide Regulation’s pesticide use reporting (PUR) process; and
- For pesticide(s) determined by the Water Board to be of water quality concern, work with the California Department of Pesticide Regulation to provide on a regular basis to the Water Board, compiled reports of use of the pesticide(s) of water quality concern, including: agency, date(s), location(s), amounts, pesticide(s), and active ingredient(s).”

14) Page A-10 & 11, Urban Runoff Management Agencies and Similar Entities Actions:

- a) 1st paragraph should include a definition of “similar entities.” Table 10-9 in the Staff Report indicates that this includes, but is not limited to, industrial facilities, construction related activities, California Department of Transportation and large institutions such as universities and military installations. This language from the table should be included in the Basin Plan amendment.
- b) 1st paragraph, 3rd sentence: the MEP standard should only apply to municipal dischargers (see Defenders of Wildlife case) as different standards apply to other dischargers such as industrial facilities.
- c) Insert at end of first paragraph: “These actions and those of the other entities included in this strategy will ensure the attainment of the allocations and targets.” This was in the previous version and should be included. The concept of other regulatory actions (i.e., section 13267 requests) should be added as such direction may be necessary for dischargers without NPDES permits.
- d) Page A-11, Monitoring Requirement, 1st bullet: Add “discharged in urban stormwater runoff” after “Monitor diazinon and other pesticides...”
- e) Page A-11, Monitoring Requirement, 3rd bullet: Conducting basic research studies to address critical data needs should be the responsibility of the pesticide industry, USEPA,

and California DPR, not the urban runoff management agencies. Add “directly related to pesticides in urban stormwater runoff discharges” after “...critical data needs...”

- f) Page A-12, 2nd full paragraph: Insert at end of sentence “and will include pesticide monitoring requirements as appropriate.” Caltrans and many industrial sites apply pesticides. These sites should include analysis of pesticides in their NPDES permits.

15) Page A-13, Monitoring Requirements:

- a) 1st set of bullets, 3rd bullet: Delete “any” and “or something else.”
- b) 1st set of bullets, 5th bullet: Delete “any.”

16) Page A-14, Monitoring Benchmarks:

This section and the concepts embodied therein were characterized in previous drafts as “provisional pesticide values”. In this draft, the values are being called “monitoring benchmarks”. Under either name, the Regional Water Board is attempting to develop and define water quality objectives, in every way but in name, when as the draft states “water quality criteria do not exist for most pesticides.” Setting aside the legal issues and regulatory standing of the Regional Water Board’s proposal, BASMAA is very concerned that this section includes measures that may be used in compliance determinations. This concept is premature and needs more time for discussion before it is included in a BPA. The monitoring benchmarks are not supported by sufficient facts in the record and are not legally appropriate. This approach is currently and will continue to receive considerable examination in other State Water Board proceedings relating to standards setting and quantifiable measures of compliance. If this section remains in the BPA, BASMAA strongly requests that the following language be added to the last paragraph in the section: “Nothing in the design, definition, development, or implementation of this section shall result in the determination that monitoring benchmarks are appropriate for use in determinations of compliance with NPDES permits for urban runoff management agencies.

17) Page A-15, Adaptive Implementation

As noted in the September 19, 2005 cover letter transmitting these comments, it is clear from the Report and from our experience that the Federal and State existing pesticide registration processes do not prevent water quality problems from occurring and are very slow to correct problems after they have occurred. While we strongly support the actions proposed in the Report for those Federal and State agencies responsible for pesticide regulation and enforcement, BASMAA remains very concerned that these actions may not be fully implemented and as a consequence municipalities will be required, through NPDES permits, to expend significant resources attempting to mitigate an impact over which they have very little control. Therefore, we request that the following paragraph be added at the bottom of section “Periodic Review”, just before Additional Sources”:

“Although the implementation plan is intended to achieve the water quality standards, conceivably, after exhausting all practicable measures, discharges may not meet the

allocations. After sufficient time has passed to develop and implement all practicable control measures and to assess their effects, a discharger could prepare a thorough account of actions taken for Water Board consideration and provide an explicit rationale for why additional measures to control pesticide discharges would be either impracticable or ineffective. The discharger could also identify potential actions that others must take to meet the water quality standards.”

18) Peer review Comments:

We did not receive the peer review comments on the Report and staff response until September 13. This material may be relevant to our comments and definitely is an important part of the hearing record. We have not had sufficient time to review this document and therefore request further time to submit comments on the peer review comments and staff response.



B A S M A A

Alameda Countywide
Clean Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Stormwater Pollution
Prevention Program

Santa Clara Valley
Urban Runoff Pollution
Prevention Program

Vallejo
Sanitation and Flood
Control District

April 12, 2004

Bill Johnson
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Comments on the Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks: Water Quality Attainment Strategy and Total Maximum Daily Load (TMDL) - Final Project Report

Dear Bill:

This letter is submitted on behalf of the Bay Area Stormwater Management Agencies Association (BASMAA) in response to the invitation to submit comments on the subject report (Report). We first want to commend you and the other Regional Water Board staff members for all the work that has gone into drafting the Report and we appreciate the opportunity to provide comments. As you know, BASMAA has been intimately involved in the effort to identify and characterize the sources of and develop solutions to the problem of pesticide-related toxicity in Bay Area urban creeks for over ten years. We are submitting these comments in part because of concerns we have regarding the impact of subsequent related Basin Plan amendments may have on our programs and agencies but primarily because, like the Regional Water Board, we are interested in eliminating pesticide-related toxicity in our creeks.

BASMAA has three general comments on the Report:

- (1) the distinction between the water quality attainment strategy and the TMDL should be much more clearly delineated;
- (2) the implementation plan for the TMDL should be developed and adopted through a separate process from the development and adoption of the TMDL; and
- (3) all potential sources of diazinon and pesticide-related toxicity in urban creeks should be separately addressed.

These items are explained in detail below. We also have included additional recommendations for specific revisions as an attachment.

1. Clearly separate the TMDL from the Water Quality Attainment Strategy

The Report is an improvement over the Preliminary Project Report (dated September 2002) in that it explicitly states that the TMDL is for diazinon only and does not include pesticide-related toxicity. However, the Report continues to treat the diazinon TMDL and the pesticide-related toxicity water quality attainment strategy (WQAS) as if they were one in the same. This intermingling leads to unnecessary ambiguity, particularly in three sections of the report:

Bay Area

Stormwater Management

Agencies Association

1515 Clay Street

Suite 1400

Oakland, CA 94612

510.622.2326

www.basmaa.org

- 1) **Numeric Targets** – pesticide-related toxicity is inappropriately addressed under the TMDL through the development of generic toxicity targets that are not specific to diazinon and therefore are beyond the scope of the diazinon TMDL;
- 2) **Allocations** – the recommended wasteload allocations for urban runoff reference the generic toxicity targets which are not specific to diazinon and therefore are beyond the scope of the diazinon TMDL; and,
- 3) **Implementation Plan** – it is not clear which activities relate to the TMDL versus the WQAS.

Additionally, the mixing of the WQAS for pesticide-related toxicity and the diazinon TMDL has lead to inappropriate assumptions. For example, some of the implementation actions appear to be based on the assumption that the sources and pathways of future pesticide-related toxicity in urban streams will be similar to the sources and pathways of diazinon related toxicity. We should not make that assumption. As you know, new pesticides are constantly being brought to market and gaining market share while others are losing market share. We cannot predict what the pesticide market will look like in ten or twenty years, what the physical properties of those pesticides will be, or which applications may be causing water quality impacts.

We recommend that the Report be revised so the diazinon TMDL, including recommended targets, allocations, and implementation actions, can be clearly separated from the WQAS for pesticide-related toxicity. This can be done by revising the Report to include separate sections for the diazinon TMDL and the WQAS for pesticide-related toxicity, or by developing two separate reports.

2. Separate the Implementation Plan from the TMDL

Neither the Clean Water Act nor the U.S. Environmental Protection Agency's (USEPA) regulations require the State Water Resources Control Board or the Regional Water Boards to seek USEPA approval of TMDL implementation plans. TMDL implementation is instead largely a function of state law. By combining the TMDL and the Implementation Plan, the Report blurs this distinction, and thereby will likely undermine the State's authority and flexibility with regard to TMDL implementation. The Regional Board should instead, separate the establishment of the "technical" TMDL (*i.e.*, the calculation of acceptable loading and allocations) from the development of TMDL implementation policies, actions, and schedules.

Sections 13241 and 13242 of the Porter Cologne Act, governs the implementation of TMDLs. The Porter Cologne Act requires Regional Water Boards to consider factors in addition to the considerations mandated by the CWA. When developing implementation plans for TMDLs, the Regional Water Board must take into account beneficial uses of the impaired waters, environmental characteristics of the hydrographic unit under consideration, reasonable limitations on water quality conditions, economic considerations, the need for developing housing, and the need to develop and use recycled water. (Water Code § 13241.) In contrast, USEPA is not required to consider all the factors identified by the Porter Cologne Act.

Stormwater agencies have generally been supportive of linking implementation planning with TMDL development, however by mixing the process of establishing (developing and approving) TMDLs with the process of developing TMDL implementation plans, the Regional Board effectively risks ceding substantial State authority and discretion to the federal government.

Therefore, in order to maintain the flexibility and independence for the Regional Water Board to implement the TMDL in accordance with the considerations required by the Porter Cologne Act, the Regional Water Board should separate the process into two parallel stages and documents, developing the “technical” TMDL and submitting it to USEPA for approval, and developing the TMDL implementation plan in a separate step of the process in which USEPA approval is not required. Separating the “technical” TMDL from the implementation plan would also help to eliminate some of the ambiguity discussed above in item one.

3. Develop Allocations for all Sources of Diazinon and Separately Identify all Sources of Pesticide-Related Toxicity

The diazinon TMDL and the WQAS for pesticide-related toxicity do not address sources other than municipal storm drain systems. The Report states that “the only source of pesticides in Bay Area urban creeks is essentially urban runoff from storm drains.” As the use of the word “essentially” indicates, there are other sources, and in the future these other sources may be as or more significant than discharges from municipal storm drain systems. The fact that these other sources have not as yet been identified as causing significant problems does not mean that they will not be identified in the future. Many or most urban creeks in the Bay Area have their headwaters in rural areas. Some of these rural areas have extensive agricultural activity occurring in them. We may find that pesticide applications on these agricultural lands are causing toxicity problems downstream in “urban” creeks. Many of these “urban” creeks also have water supply reservoirs upstream. These reservoirs are often treated with pesticides to control algal growth and there have been instances where these pesticides have been detected downstream in significant concentrations. In addition, the Report states that diazinon is not conveyed through groundwater due to its relatively low solubility and the anticipated replacement pesticides are even less soluble. However, imidacloprid is currently registered for use for injection into the soil for termite control as well as for lawn and garden use. Imidacloprid is far more soluble than diazinon and is on the California Department of Pesticide Regulation’s Groundwater Contaminant List. If imidacloprid gains significant market share, groundwater conveyance could be a significant source of pesticide-related toxicity.

In addition to these potential future scenarios, there may be current sources of diazinon in Bay Area urban creeks other than those conveyed by urban runoff. The Report states that “Some agricultural pesticide use does occur within the Water Board’s jurisdiction, but it is a negligible contributor”, and notes that “...less than 2% of all the reported and unreported diazinon use in the Bay Area that year” [2000] was for agricultural purposes in the nine Bay Area counties. Normally, less than 2% might be negligible, but given the research that shows it takes less than a fluid ounce of active ingredient to cause toxicity in urban creeks, no source can be considered negligible or insignificant. Given the miniscule amounts of diazinon it takes to cause an impact, using the approach toward sources described in the Report, it is very possible that all sources of diazinon to urban runoff could be eliminated and there would still be diazinon in urban creeks. After December 2004, the following uses of diazinon will still be allowed: use for food crops, fruit trees, ornamental nurseries, cut flowers, cattle, and squirrels.

We therefore recommend that all potential point and non-point dischargers to urban creeks: (1) be assigned equivalent concentration-based allocations in the diazinon TMDL; and, (2) be separately addressed in the WQAS for pesticide-related toxicity.

Thank you again for this opportunity to comment on the Report. We look forward to continuing to work with you on this issue. Please contact me at (925) 313-2373, Jim Scanlin (510) 670-6548, or Geoff Brosseau (510) 622-2326 if you have any questions regarding the comments or suggested changes.

Sincerely,

A handwritten signature in black ink, appearing to read "Donald P. Freitas". The signature is fluid and cursive, with a large, stylized 'D' and 'F'.

Donald P. Freitas
BASMAA Executive Board Chair

Attachment: Additional BASMAA comments

cc: Jim Scanlin, ACCWP / CEP Diazinon Work Group
Geoff Brosseau, BASMAA
Arleen Feng, BASMAA Monitoring Committee / CEP Technical Committee
BASMAA Executive Board
Robert Hale, ACCWP
Kevin Cullen, FSURMP
Liz Lewis, MCSTOPPP
Bob Davidson, SMCSTOPPP
Adam Olivieri, SCVURPPP
Emily Dean, SCWA
Jack Betourne, VSFCD
BASMAA Monitoring Committee Representatives
Tom Mumley, SFBRWQCB
Bruce Wolfe, SFBRWQCB
Dale Bowyer, SFBRWQCB
Andy Gunther, Clean Estuary Partnership

These specific comments are in addition to the general comments in the April 12, 2004 BASMAA comment letter.

1) Clearly distinguish the TMDL scope from the WQAS scope

BASMAA recommends that these scopes be clearly stated, for example as graphic or a simple set of bullets:

WQAS is larger scope and includes the TMDL scope

- for all Bay Area urban creeks
- pesticide-related toxicity

TMDL

- 37 Bay Area urban creeks
- diazinon

2) Determine what the goals or focus of the WQAS, TMDL, and as needed the individual parts (e.g., Implementation Plan, Monitoring and Adaptive Implementation) are; and then use consistent terminology and phraseology to describe them.

The use of different terms and phrases will lead to misinterpretations and misunderstandings now and over the long course of implementation. Examples of inconsistent use of terms and phrases are (within each set of colored text, different terms and phrases are being used to make what appear to be the same statement):

Summary

(p. S-1) ...a strategy to **eliminate** **pesticide-related toxicity** from **Bay Area urban creeks**.

(p. S-1) The water quality attainment strategy **addresses** **water quality threats posed by pesticides** discharged to **urban creeks**.

(p. S-1) ...the overarching water quality attainment strategy that **addresses** **general water quality threats posed by pesticides**.

Summary – Implementation Plan

(p. S-3) The over-arching strategy for **reducing** **pesticide-related toxicity** in **urban runoff** is to avoid the use of conventional pesticides that threaten water quality.

Implementation Plan

(p. 77) The strategy is intended to **prevent** **pesticide discharges that impair** **water quality**.

Monitoring and Adaptive Implementation

(p. 91) Analytical... tests will focus on **pesticides that pose substantial water quality risks** and for which commercially viable analytical methods are available).

Attachment: Additional BASMAA comments on the Diazinon TMDL and Pesticide-Related Toxicity WQAS in Bay Area Urban Creeks Final Project Report

BASMAA recommends the following terms be used throughout the TMDL and WQAS documents, and that these sentences and other similar ones be revised to use these terms:

implement (or attain) the applicable water quality standard (this phraseology is from the CWA and the CEP MOU)

pesticide-related toxicity

Bay Area urban creeks

PROPOSED BASIN PLAN AMENDMENT

The following changes, shown in double underline/strikeout, apply to the section titled "TOXICITY" in Chapter 3.

Toxicity

All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms. Detrimental responses include, but are not limited to, decreased growth rate and decreased reproductive success of resident or indicator species. There shall be no acute toxicity in ambient waters. ~~AI~~n the context of municipal and industrial wastewater discharges, acute toxicity is defined as a median of less than 90 percent survival, and less than 70 percent survival, 10 percent of the time, or of test organisms in a 96-hour static or continuous flow test.

There shall be no chronic toxicity in ambient waters. Chronic toxicity is a detrimental biological effect on growth rate, reproduction, fertilization success, larval development, population abundance, community composition, or any other relevant measure of the health of an organism, population, or community. Chronic toxicity generally results from exposures to pollutants exceeding 96 hours. However, chronic toxicity may also be detected through short-term exposure of critical life stages of organisms.

~~As Compliance with Attainment of~~ this objective will be evaluated on the basis of available information. Such information may include numeric criteria and guidelines for toxic substances such as those developed by other California agencies, the U.S. Environmental Protection Agency, and the National Academy of Sciences. In the context of municipal and industrial wastewater discharges, at a minimum, compliance will be evaluated using the bioassay requirements contained in Chapter IV.

The health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ significantly from those for the same waters in areas unaffected by controllable water quality factors.

The following text, in its entirety, is to be inserted in Chapter 4, immediately after the introduction of the section titled “TOXIC POLLUTANT MANAGEMENT IN THE LARGER SAN FRANCISCO BAY ESTUARY SYSTEM.” For clarity, it is not shown with double underline.

Water Quality Attainment Strategy for Pesticide-Related Toxicity and TMDL for Diazinon ~~and Pesticide-Related Toxicity~~ in Urban Creeks

The following sections establish a water quality attainment strategy for pesticide-related toxicity (strategy) and a TMDL for diazinon ~~and pesticide-related toxicity~~ (TMDL) in the Region’s urban creeks, including actions and monitoring necessary to implement the strategy and TMDL. “Pesticides” are substances (or mixtures of substances) intended for defoliating plants, regulating plant growth, or preventing, destroying, repelling, or mitigating pests that may infest or be detrimental to vegetation, humans, animals, or households, or be present in any agricultural or nonagricultural environment. “Urban creeks” are ~~portions of~~ creeks that flow through urban areas, including incorporated cities and towns and unincorporated areas with similar land use intensities. This strategy applies to all San Francisco Bay Region urban creeks, including but not limited to those named in Table 4.z.

The numeric targets, allocations, strategy goals and implementation plan described below will ensure that urban creeks attain applicable water quality standards established to protect and support beneficial uses. This strategy and the TMDL will also reduce pesticide discharges to the Bay from urban creeks. The effectiveness of the implementation actions, the monitoring undertaken to track progress toward targets and strategy goals, and the most current scientific understanding pertaining to pesticide-related toxicity will be periodically reviewed, and the strategy and, if appropriate, TMDL, will be adapted as necessary to reflect changing conditions and information.

Problem Statement

In 1998, a number of the Region’s urban creeks were placed on the 303(d) list of impaired waters due to toxicity attributed to diazinon. In the early 1990s, many of the Region’s urban creek water samples were toxic to aquatic organisms. Studies found that pesticides, particularly diazinon, caused the toxicity. When pesticide-related toxicity occurs in urban creek water or sediment, creeks do not meet the narrative toxicity objective. When pesticide-related toxicity occurs in sediment, the creeks also do not meet the narrative sediment objective. Urban creek waters that fail to meet these objectives are not protective of cold and warm freshwater habitats.

Although, the U.S. Environmental Protection Agency phased out urban diazinon applications at the end of 2004, other pesticides may also pose potential water quality and sediment quality concerns because current gaps in pesticide registration ~~regulatory~~ programs could, in the absence of appropriate consideration, allow pesticides to be used in ways that threaten water quality.

**TABLE 4.z
Urban Creeks**

County	Creek		
<i>Alameda County</i>	Alameda Creek*	Codornices Creek	San Lorenzo Creek*
	Arroyo de la Laguna*	Crandall Creek	Sausal Creek
	Arroyo de las Positas*	Dry Creek	Strawberry Creek
	Arroyo del Valle*	Laguna Creek	Sulphur Creek
	Arroyo Mocho*	Peralta Creek	Temescal Creek
	Arroyo Viejo	San Leandro Creek*	Ward Creek
<i>Contra Costa County</i>	Baxter Creek	Pine Creek*	Rodeo Creek*
	Cerrito Creek	Pinole Creek*	San Pablo Creek*
	Garrity Creek	Refugio Creek	Walnut Creek*
	Mount Diablo Creek*	Rheem Creek	Wildcat Creek*
<i>Marin County</i>	Arroyo Corte Madera del Presidio*	Coyote Creek*	Novato Creek*
	Corte Madera Creek*	Gallinas Creek*	San Antonio Creek*
		Miller Creek*	San Rafael Creek*
<i>San Mateo County</i>	Belmont Creek	Laurel Creek	San Bruno Creek
	Colma Creek	Mill Creek	Sanchez Creek
	Cordilleras Creek	Pulgas Creek	San Mateo Creek*
<i>Santa Clara County</i>	Calabazas Creek*	Matadero Creek*	San Francisquito Creek*
	Coyote Creek*	Permanente Creek*	Saratoga Creek*
	Guadalupe River*	San Felipe Creek*	Stevens Creek*
	Los Gatos Creek*		
<i>Solano County</i>	Laurel Creek*	Ledgewood Creek*	Suisun Slough*
<i>Sonoma County</i>	Petaluma River*†		

* Creek designated as impaired pursuant to Clean Water Act §303(d) due to toxicity attributed to diazinon.

† ~~Many of the creeks listed, including the Petaluma River, drains substantial agricultural and other non-urban areas; therefore, the TMDL may not fully address all its pesticide sources. However, the strategy does apply to the urban portion of the Petaluma River to address its urban sources.~~ [NOTE: MAY NOT WANT TO SUGGEST TO EPA THAT TMDL DOESN'T ADDRESS ALL SOURCES.]

Numeric Targets and Strategy Goals

The numeric targets and strategy goals below translate the narrative toxicity and sediment objectives into quantitatively measurable water quality parameters. Meeting these pesticide-related toxicity goals and diazinon concentration targets will protect cold and warm freshwater habitats. These As indicated above, pursuant to the TMDL and the strategy, the diazinon targets shall be met-addressed at all urban creek locations, including those near storm drain outfalls where urban runoff enters receiving waters.

Toxicity

The toxicity targets-goals are expressed in terms of acute toxic units (TU_a) and chronic toxic units (TU_c). The goals of the strategy are that pPesticide-related acute and chronic toxicity in urban creek water and sediment, as determined through standard toxicity tests, shall not exceed 1.0 TU_a or 1.0 TU_c, where TU_a = 100/NOAEC and TU_c = 100/NOEC. “NOAEC” is the no observed adverse effect concentration, which is the highest tested

concentration of a sample that causes no observable adverse effect (i.e., mortality) to exposed organisms during an acute toxicity test. “NOEC” is the no observable effect concentration, which is the highest tested concentration of a sample that causes no observable effect to exposed organisms during a chronic toxicity test. NOAEC and NOEC are both expressed as the percentage of a sample in a test container (e.g., an undiluted sample has a concentration of 100%). In both cases, an observable effect must be statistically significant and at least 20% greater than observed in control samples. These numeric toxicity ~~targets~~ goals and related methodologies do not limit the Water Board’s authority to evaluate ~~compliance with~~ attainment of the narrative objectives through other appropriate means.

The above definitions of TU_a and TU_c apply only to ambient conditions in the context of this ~~diazinon TMDL and~~ pesticide-related toxicity strategy. They do not necessarily apply to Table 4-6, which relates to wastewater effluent.

Diazinon

The numeric target for the TMDL is that d~~d~~iazinon concentrations in urban creeks shall not exceed 100 ng/l during any one-hour period more than once every three years.

Sources

Pesticides, including diazinon, enter urban creeks ~~primarily~~ through urban runoff discharged from storm drains. ~~Urban R~~unoff contains pesticides as a result of pesticides being manufactured, formulated into products, and sold through distributors and retailers to businesses and individuals who apply them for structural pest control, landscape maintenance, agricultural, and other pest management purposes. Factors that affect pesticide concentrations in urban creeks include the amount used, the chemical and physical properties of the pesticide as formulated into a product, the sites of use (e.g., landscaping, turf, or paved surfaces), and irrigation practices and precipitation. In the San Francisco Bay Region, ants are the most common pest problem for which pesticides are used. Pesticide use by structural pest control professionals and use of products sold over-the-counter can be among the greatest contributors to ~~urban~~ pesticides in urban runoff.

Total Maximum Daily Load and Related Aspects of the Strategy

The assimilative capacity of San Francisco Bay Region urban creeks for diazinon ~~and pesticide-related toxicity~~ is the amount of diazinon ~~and pesticide-related toxicity~~ they can receive without violating water quality standards. For the urban creeks to assimilate diazinon ~~and other pesticide discharges~~ and meet water quality standards, the targets must be met. Similarly, for urban creeks to assimilate other pesticide discharges and meet applicable water quality standards, the strategy goals will need to be addressed.

Rather than establish a mass-based TMDL to attain the targets, the TMDL for diazinon is expressed in concentration units, i.e., “diazinon concentrations in urban creeks shall not exceed 100 ng/l during any one-hour period more than once every three years.” Thus, because concentration units (rather than mass) is being used, the TMDL concentration units is equal to the targets.— The targets rely on a conservative approach that provides

an implicit margin of safety to account for any lack of knowledge concerning the relationship between the allocations and water quality. Weather and seasons affect creek flows and pesticide loads, concentrations, and toxicity. By expressing the strategy goals and targets in terms of toxicity and diazinon concentrations respectively, the inherent pesticide and diazinon mass loads automatically reflects seasonal and other critical conditions as creek conditions change.

Allocations and Related Aspects of the Strategy

The TMDL is allocated to all urban storm drains and to [insert list of other point and non-point sources to which the diazinon concentration limit should be applied, e.g., landscape operators, pesticide applicators, vineyards, Caltrans, etc.] [NOTE: Since this is concentration, not mass-based, applying the TMDL to more sources should not be a big deal or require a division of the allocation according to equitable factors, etc.]. The allocations are ~~are~~ expressed in terms ~~of toxic units and~~ diazinon concentrations, and are the same as the numeric targets and the TMDL. Progress towards or attainment of the allocation/target/TMDL will be demonstrated in receiving waters. Similarly, the strategy goals are expressed in terms of toxicity units that are the same as the goals themselves, and progress towards addressing the strategy goals will be evaluated in receiving waters as well.

TMDL and Strategy Implementation

The cornerstone of ~~this the TMDL and the~~ strategy is pollution prevention. Pesticide-related toxicity in San Francisco Bay Region urban creeks is to be eliminated for diazinon and prevented with respect to other pesticides by using pest management alternatives that protect water quality and not using pesticides that threaten water quality. This Currently, it appears that this can best be accomplished through the rigorous application of integrated pest management techniques and the use of ~~least-less~~ toxic pest control methods. “Integrated pest management” refers to a process that meets the following conditions:

- Pest control practices focus on long-term pest prevention through a combination of techniques, such as biological control, habitat manipulation, and modification of cultural practices;
- Pesticides are used only after monitoring indicates that they are needed;
- Treatments are made with the goal of removing only the target pest; and
- Pesticides are selected to minimize risks to human health, beneficial and non-target organisms, and the environment, including risks to aquatic habitats associated with pesticide discharges.

“~~Least-Less~~ toxic pest control” refers to the use of pesticides selected to minimize the potential for pesticide-related toxicity in water and sediment.

TMDL implementation will occur automatically as a function of the 2004 U.S. Environmental Protection Agency phase-out of urban diazinon applications. Since diazinon will no longer be available for purchase in urbanized areas, existing stocks will

quickly be depleted within a reasonably short time and further use will be terminated. However, since other pesticides will likely be developed as substitutes for diazinon, s

Strategy implementation will focus on three areas: (1) regulatory programs, (2) education and outreach, and (3) research and monitoring. Regulatory programs will prevent pollution by using existing regulatory tools to ensure that pesticides are not applied in a manner that results in discharges that threaten urban creek uses. Education and outreach programs will focus on decreasing demand for pesticides that threaten water quality, while increasing awareness of alternatives that pose less risk to water quality. Research will fill existing information gaps, and monitoring will be used to measure implementation progress and success. The actions ~~proposed-discussed~~ below are intended to address these strategic ~~goals~~objectives.

Many entities share responsibility for potential pesticide-related toxicity, and many entities share potential responsibility for implementing actions to ensure that pesticide-related toxicity does not threaten water quality. Although the ~~allocation strategy goals applies-apply~~ to all urban storm drains, responsibility for attaining the ~~allocations-strategy goals~~ is not the sole responsibility of urban runoff management agencies, whose authority to regulate pesticide use is constrained. Actions to be implemented by regulatory agencies, urban runoff management agencies, and other entities are listed below. Many entities are already implementing these actions. The remaining actions will be phased in as soon as possible. Actions that can be required through NPDES permits are already in some permits and shall be incorporated into all applicable NPDES permits when the permits are reissued. In addition, other regulatory and non-regulatory actions will be used as Voluntary-voluntary actions should commence immediately, and inter-agency coordination is already underway.

Regulatory Agencies

The agencies with the broadest authorities to oversee pesticide use and pesticide discharges include the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and the Water Board. Regulatory and non-regulatory actions are needed to ensure that pesticide use does not result in discharges that cause or contribute to toxicity in urban creeks.

Water Board Actions

The role of the Water Board is to encourage, monitor, and enforce implementation actions, and to lead by example. The Water Board will implement the following actions related to regulatory programs:

- Track U.S. Environmental Protection Agency pesticide evaluation and registration activities as they relate to surface water quality and share monitoring and research data;
- When necessary, request that the U.S. Environmental Protection Agency coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the Clean Water Act;

- Encourage the U.S. Environmental Protection Agency to accommodate water quality concerns within its pesticide registration process;
- Work with the California Department of Pesticide Regulation and Structural Pest Control Board to ensure, through the use of licensing and registration (e.g., pest control operators) as well as other (e.g., education) mechanisms, that pesticide applications result in discharges that comply with the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act; ~~and~~
- Interpret water quality standards for the California Department of Pesticide Regulation and assemble available information (such as monitoring data) to assist the California Department of Pesticide Regulation and County Agricultural Commissioners to take actions necessary to protect water quality;-
- Work with County Agricultural Commissioners to use and/or adopt local pest control regulations, as necessary, to avoid toxicity in urban creeks; and
- Use permitting mechanisms (e.g., Industrial General Permit, Construction General Permit) to require implementation of best management practices and control measures to reduce pesticide-related toxicity in urban creeks.

The Water Board will implement the following actions related to outreach and education:

- Encourage integrated pest management and least toxic pest management practices;
- Encourage grant funding for activities likely to reduce pesticide discharges, promote least toxic pest management practices, or otherwise further the goals of this implementation plan; and
- Encourage pilot demonstration projects that show promise for reducing pesticide discharges throughout the Region.

The Water Board will implement the following actions related to research, monitoring, and overall program coordination:

- Promote and support studies to address critical data needs (see Adaptive Implementation, below); and
- Assist municipalities and others implementing the strategy by convening stakeholder forums to coordinate implementation.

U.S. Environmental Protection Agency Actions

The U.S. Environmental Protection Agency is responsible for implementing the Federal Insecticide, Fungicide, and Rodenticide Act and the Clean Water Act. The U.S. Environmental Protection Agency is therefore responsible for ensuring that both federal pesticide laws and water quality laws are implemented. The U.S. Environmental Protection Agency should exercise its authorities to ensure that foreseeable pesticide applications do not cause or contribute to water column or sediment toxicity in the Region's waters. Because some pesticides pose water quality risks, the U.S. Environmental Protection Agency should implement the following actions:

- Continue internal coordination efforts to ensure that pesticide applications comply with water quality standards and avoid water quality impairment (i.e., restrict uses or application practices to manage risks);
- Continue and enhance education and outreach programs to encourage integrated pest management and least toxic pest control; and
- Complete studies to address critical data needs (see Adaptive Implementation, below).

California Department of Pesticide Regulation Actions

The California Department of Pesticide Regulation regulates pesticide product sales and use within California pursuant to the California Food and Agricultural Code, which vests it with the authority to regulate pesticides to protect water quality. Specifically, the California Department of Pesticide Regulation is to prohibit or regulate environmentally harmful materials, which can include those with potential for environmental damage, including interference with attainment of water quality objectives. Confirmed and likely (based on available information) pesticide-related violations of water quality standards (i.e., water or sediment toxicity) meet the regulatory thresholds for California Department of Pesticide Regulation action specified in the California Food and Agricultural Code and Title 3 of the California Code of Regulations. Specifically, confirmed and likely pesticide-related violations of water quality standards may result in serious uncontrolled adverse effects on the environment. Pesticides used such that their runoff violates or poses a reasonable potential to violate water quality standards are environmentally harmful materials that require protective measures.

To be effective, this strategy relies on the California Department of Pesticide Regulation to use its authorities. Consistent with its authorities, the California Department of Pesticide Regulation should implement the following actions:

- Work with the Water Board to identify pesticides potentially applied in urban areas in a manner such that runoff could cause or contribute to violations of water quality standards;
- Use authorities to prevent potential pesticide-related surface water impairment before it occurs;
- Continue and enhance education and outreach programs to encourage integrated pest management and least toxic pest control; and
- Complete studies to address critical data needs (see Adaptive Implementation, below).

Collaboration within the California Environmental Protection Agency

As sister agencies within the California Environmental Protection Agency, the Water Board and the California Department of Pesticide Regulation should coordinate pesticide and water quality regulation in the Region. In 1997, the California Department of Pesticide Regulation and the State Water Resources Control Board entered into a management agency agreement. The California Department of Pesticide Regulation agreed to ensure that compliance with numeric and narrative water quality objectives is

achieved. The State and Regional Water Boards retained responsibility for interpreting compliance with narrative water quality objectives. In light of the agreement, the Water Board and the California Department of Pesticide Regulation should work together to prevent runoff that exceeds water quality standards before water quality standards are exceeded.

The need to act should not depend solely on surface water monitoring data because such an approach would not prevent pollution before it occurs. In consultation with the California Department of Pesticide Regulation, the Water Board will implement the following actions:

- Review pesticide sales and use data to determine pesticides most commonly used in urban areas and most likely to run off and cause or contribute to violations of water quality criteria; and
- Select pesticides for further evaluation based on their chemical and physical properties, toxicological properties, and sites of use, and convey this information to the California Department of Pesticide Regulation.

In consultation with the Water Board, the California Department of Pesticide Regulation should implement the following actions:

- Initiate pest management assessments on common pests for which pesticides of concern identified by the Water Board are used;
- Use re-evaluation authorities to obtain necessary information concerning pesticides of concern identified by the Water Board, and if information gaps remain, make conservative (i.e., protective) assumptions to fill them;
- Estimate foreseeable water and sediment pesticide concentrations and compare them with water quality objectives, criteria, or provisional values (see Adaptive Implementation, below); and
- Use authorities to restrict pesticide applications sufficiently to ensure that foreseeable water and sediment concentrations are below water quality objectives and criteria (i.e., adopt regulations, direct registrants to mitigate potential water quality concerns, designate certain pesticides as restricted materials subject to permit conditions, or refuse or cancel registrations as necessary).

Urban Runoff Management Agencies

NPDES permits for urban runoff management agencies shall require implementation of best management practices and control measures. These actions and those of the other entities included in this strategy will result in attainment of the allocations, and targets, and strategy goals. Requirements in each NPDES permit issued or reissued and applicable for the term of the permit shall be based on an updated assessment of control measures intended to reduce pesticides in urban runoff to the maximum extent practicable and remain consistent with the section of this chapter titled “Surface Water Protection and Management—Point Source Control - Stormwater Discharges.” Permit requirements shall focus on (1) support for pesticide regulatory actions that protect water quality, (2) adoption and implementation of integrated pest management and less ~~least~~ toxic

management practices within municipal operations and promotion of such practices within the local and regional communities, and (3) characterization and assessment of conditions within urban creeks receiving pesticide runoff.

The following general requirements shall be incorporated into NPDES permits issued or reissued for storm drain discharges:

1. Reduce reliance on pesticides that threaten water quality by adopting and implementing policies, procedures, or ordinances that minimize the use of pesticides that threaten water quality in municipal operations and on municipal property;
2. Track progress by periodically reviewing municipal pesticide use and pesticide use by hired contractors;
3. Train municipal employees to use integrated pest management techniques and require that they rigorously adhere to integrated pest management practices;
4. Require municipal contractors to practice integrated pest management;
5. ~~Require pest-resistant landscaping at new development and re-development sites, minimize impervious surfaces at these sites, and encourage landscape designs that tend to delay runoff entering nearby creeks~~ Encourage (a) the use of appropriate landscaping at new development and redevelopment sites, (b) the minimization of impervious surface at these sites, and (c) the use of landscape designs that tend to delay runoff from entering nearby creeks; and
6. Study the effectiveness of ~~all~~ control measures implemented, evaluate attainment of the targets and progress in addressing the strategy goals, identify effective actions to be taken in the future, and report conclusions to the Water Board.

The following education and outreach requirements shall be incorporated into NPDES permits issued or reissued for storm drain discharges:

1. Undertake targeted outreach programs to encourage communities to reduce their reliance on pesticides that threaten water quality. Educate municipal employees ~~(whether or not they apply pesticides as part of their work responsibilities)~~, local businesses (e.g., restaurants), structural and landscape pest control professionals, and the public at large. Focus efforts on audiences most likely to use pesticides that threaten water quality; and
2. Facilitate appropriate pesticide waste disposal, and conduct education and outreach to promote appropriate disposal.

The following research and monitoring requirements shall be incorporated into NPDES permits:

1. Monitor diazinon ~~and toxicity in urban creeks~~, and other pesticides as needed; ~~monitor~~ investigate toxicity in both water and sediment; and implement alternative monitoring mechanisms, if appropriate, to indirectly evaluate water quality; and
2. Submit disseminate monitoring ~~and research~~ data ~~with to appropriate~~ regulatory agencies (e.g., the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation); and

3. ~~Track U.S. Environmental Protection Agency pesticide evaluation and registration activities as they relate to surface water quality and, when necessary, request that the U.S. Environmental Protection Agency coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the Federal Clean Water Act; encourage the U.S. Environmental Protection Agency to accommodate water quality concerns within its pesticide registration process.~~

The following requirements related to regulatory programs shall be incorporated into NPDES permits:

1. Participate/support efforts which encourage the U.S. Environmental Protection Agency to coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act with the Federal Clean Water Act, and to otherwise accommodate water quality concerns within its pesticide registration process.
- ~~1.2.~~ Participate/support efforts (potentially including the submission of information such as monitoring data) which encourage the ~~Assemble and submit information (such as monitoring data) as needed to assist the~~ California Department of Pesticide Regulation ~~in to ensuring ensure~~ that pesticide applications within the Region comply with both the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act;
- ~~2.3.~~ Report violations of pesticide regulations (e.g., illicit discharges, inappropriate handling) to County Agricultural Commissioners; and
- ~~3.4.~~ Work with County Agricultural Commissioners to adopt local pest control regulations, as necessary, to prevent toxicity in urban creeks.

An urban runoff management agency that complies with these permit requirements shall be deemed to be in compliance with receiving water limitations relative to pesticides, including, but not limited to, diazinon, and pesticide-related toxicity registered for use by the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation. Once the Water Board accepts that a requirement has been completed by an urban runoff management agency, it need not be included in subsequent permits for that agency discharger. These requirements also apply to municipalities covered by the statewide municipal stormwater general permit (issued by the State Water Resources Control Board) five years after the effective date of this strategy.

Other Entities

Government Entities

County Agricultural Commissioners provide local enforcement of applicable pesticide laws and can adopt regulations that govern the conduct of pest control operations and the records and reports of those operations. County Agricultural Commissioners should implement and report to the Water Board on the the following actions:

- Continue and enhance enforcement related to overuse and misuse of pesticides, including pesticides sold over-the-counter;

- Continue to enforce the phase out of diazinon products and any new regulations affecting pesticide applications and their water quality risks;
- Work with urban runoff management agencies and the Water Board to adopt local pest control regulations, as necessary, to avoid toxicity in urban creeks; and
- Continue to coordinate with and contribute to education and outreach efforts undertaken by urban runoff management agencies and others.

The Structural Pest Control Board is responsible for licensing structural pest control professionals. The Structural Pest Control Board requires training and examinations to maintain a license to practice structural pest control, and regulates the advertising practices of structural pest control businesses. The Structural Pest Control Board should implement [and report to the Water Board on](#) the following actions:

- Work to develop a mechanism through which consumers can determine which structural pest control providers offer services most likely to protect water quality; and
- Work to enhance initial and continuing integrated pest management training for structural pest control licensees.

The University of California Statewide Integrated Pest Management Program promotes pest management education and outreach throughout California. The University of California should implement the following actions:

- Continue and enhance educational efforts targeting urban pesticide users to promote integrated pest management and least toxic pest management practices; and
- Continue to encourage and support efforts to identify and improve new less toxic pest management strategies for the urban environment.

[\[Insert needed regarding Caltrans\]](#)

Private Entities

Most pesticides do not occur naturally in the environment; they are manufactured. Pesticide manufacturers and formulators sell products to distributors and retailers, who sell them to the pesticide users who apply them. All these private entities should implement the following actions to prevent pesticide-related toxicity in urban creeks:

- Pesticide manufacturers and formulators should minimize potential pesticide discharges by developing and marketing products designed to avoid discharges that exceed water quality objectives. Many manufacturers successfully market such products. They should also undertake studies to address critical data needs (see Adaptive Implementation, below);
- Distributors and retailers should offer point-of-sale information on least toxic alternatives. They should also offer and promote least toxic alternatives to customers;
- Pest control advisors should recommend integrated pest management strategies so pesticides that could threaten water quality are used only as a last resort; and

- Pesticide users including [insert list of examples of the users being addressed, e.g., commercial pesticide applicators, landscapers, etc.] should adopt integrated pest management and least toxic pest control techniques so pesticide applications do not contribute to pesticide runoff and toxicity in urban creeks.

Monitoring

Monitoring is needed to demonstrate target attainment and to track and evaluate the effectiveness of the strategy. Diazinon monitoring needs to demonstrate that diazinon concentrations meet the target. When the concentrations consistently drop below the target, such monitoring ~~may will~~ no longer be needed. However, because other pesticides will continue to be applied in urban areas, the need to monitor for water and sediment toxicity—and sometimes specific chemicals—will likely remain well after achieving the diazinon concentration target.

A number of programs monitor pesticide concentrations and toxicity in the Region's waters, including the Water Board's Surface Water Ambient Monitoring Program, the California Department of Pesticide Regulation's Surface Water Protection Program, and the Regional Monitoring Program. Municipal stormwater NPDES permits also often require dischargers to characterize their discharges and receiving waters. This generally can involves monitoring toxicity and specific pollutants, like diazinon, in storm drains and urban creeks.

Pursuant to NPDES permits, urban runoff management agencies shall lead-undertake and encourage/support monitoring efforts related to pesticides and toxicity. They shall be responsible for designing and implementing a monitoring program ~~with a goal of~~ answer-answering the following monitoring questions:

- Is the diazinon concentration target being met?
- Are the toxicity targets-strategy goals being ~~met~~ addressed?
- If not, is urban runoff the source of diazinon or toxicity?
- If urban runoff is the source of toxicity, is the toxicity pesticide related? pesticide-related toxicity a problem in urban creeks (i.e., is the toxicity caused by a pesticide or something else)?
- If the toxicity target is not met because of a pesticide, how do the toxicity and the concentrations of the toxic pesticide vary in time and magnitude across urban watersheds?
- Are actions being taken to reduce pesticide discharges sufficiently improving creek conditions to meet targets and strategy goals?

The monitoring program may be developed by individual urban runoff management agencies, jointly by two or more local agencies acting in concert, or cooperatively through a regional approach (for example, SWAMP or the Regional Monitoring Program). Designing the program shall involve characterizing watersheds, selecting representative creeks, identifying sample locations, developing sampling plans, and selecting appropriate analytical tests of water and sediment. ~~Chemical and toxicity tests~~

~~shall be conducted on urban creek water and sediment.~~ At a minimum, tests shall be used to measure the following:

- Water column toxicity;
- Sediment toxicity;
- Diazinon concentrations in water (until the diazinon concentration target is met consistently); and
- Chemical concentrations of other pesticides in water or sediment, as appropriate and feasible.

~~Sampling shall occur during at least two flow regimes: during storms that produce substantial runoff to urban creeks (ideally including the “first flush”) and during the dry season. The Sampling frequency, timing and~~ number of samples shall be adequate to answer the monitoring questions above and any others set forth for the monitoring program.

Additional types of monitoring tools may be used to support and optimize conventional water quality monitoring. For example, monitoring in storm drains or near application sites may be useful in selecting creek sampling strategies because pesticide concentrations are easier to detect nearer to the pesticide application site. Efforts to monitor parameters that can serve as surrogates or indicators of pesticide-related water quality conditions may moderate the need for more comprehensive water quality monitoring. While some toxicity and pollutant monitoring will usually-always be necessary, extensive monitoring will be less important if other information is collected that indicates the potential for toxicity or specific pollutants to occur in water. Alternative monitoring information can also help focus water quality monitoring efforts and mitigation actions. Such monitoring could include reviewing pesticide sales and use data for the Region, pesticide fate and transport data, and public attitudes regarding pesticides and water quality. Such monitoring could seek to answer the following questions:

- What pesticides pose the greatest water quality risks?
- How is the use of such pesticides changing?
- Are existing actions effective in reducing toxic pesticide discharges that threaten water quality?

ADAPTIVE IMPLEMENTATION

Adaptive implementation entails applying the scientific method to decision-making (i.e., taking immediate actions commensurate with available information, reviewing new information as it becomes available, and modifying actions as necessary based on the new information). Taking immediate action allows progress to occur while more and better information is collected and the effectiveness of current actions is evaluated.

Periodic Review

The Water Board will review this [TMDL and](#) strategy approximately every five years. The reviews will be coordinated through the Water Board's continuing planning program and will provide opportunities for stakeholder participation. If any modifications are needed, they will be incorporated into the Basin Plan. At a minimum, the following focusing questions will be used to conduct the reviews. Additional focusing questions will be developed in collaboration with stakeholders during each review.

1. Are urban creeks progressing toward the targets [and goals](#) as expected?
2. If it is unclear whether there is progress, how should monitoring efforts be modified to detect trends?
3. If there has not been adequate progress, how might the implementation actions or allocations be modified?
4. Is there new information that suggests the need to modify the targets, allocations, [strategy goals](#), or implementation actions?
5. If so, how should the strategy be modified?

During the periodic reviews, the Water Board will consider newly available information regarding such topics as market trends, monitoring results, tools for risk evaluation, outreach effectiveness, and regulatory actions.

Although the implementation plan is intended to achieve the water quality standards, conceivably, after exhausting all practicable measures, discharges may not meet the allocations [or fully address the strategy goals](#). After sufficient time has passed to develop and implement all practicable control measures and to assess their effects, a discharger could prepare a thorough account of actions taken for Water Board consideration and provide an explicit rationale for why additional measures to control pesticide discharges would be either impracticable or ineffective. The discharger could also identify potential actions that others must take to meet the water quality standards.

New Sources

As the strategy is implemented, new sources of pesticide-related toxicity may emerge, either as the result of a new source being discovered or a new pesticide being applied. The Water Board will consider establishing a [TMDL and](#) allocation for a new source if necessary [or otherwise refine the strategy](#). The Water Board may also consider establishing new targets [and/or goals](#) to address specific pesticides likely to cause or contribute to pesticide-related toxicity.

Critical Data Needs

Various types of information and tools are needed to adequately evaluate the risks associated with pesticide runoff. To the extent possible, the pesticide industry should shoulder the burden of collecting this information and developing appropriate tools. At times, however, the citizens of the Region (as represented by the Water Boards and the urban runoff management agencies) should lead by example. Therefore, the pesticide industry should undertake and regulatory agencies should support and promote the following actions:

- Develop publicly available and commercially viable analytical methods to detect ecologically relevant concentrations of pesticides that pose water quality risks;
- Develop Toxicity Identification Evaluation procedures that can be used to identify potential toxicity in water and sediment;
- Complete publicly available studies that characterize the fate and transport of pesticides applied in urban areas;
- Develop and adopt evaluation methods (e.g., quantitative fate and transport models) for urban pesticide applications, including applications to impervious surfaces; and
- Complete publicly available studies to support the development of water quality criteria for pesticides in water and sediment.

For most pesticides, numerical water quality criteria have not been developed. The Water Board will work with appropriate regulatory agencies to develop and implement guidance for developing provisional pesticide values that can be applied to receiving water bodies for the protection of aquatic life. Calculation of a provisional value does not eliminate the need to obtain data sufficient to develop water quality criteria. ~~In the absence of water quality criteria, a provisional value may be calculated as follows. Where valid tests have determined 96-hour LC₅₀ values for aquatic organisms (the concentration that kills one half of the test organisms in 96 hours), a provisional value for the protection of aquatic life may be calculated by dividing the 96-hour LC₅₀ for the most sensitive species tested by ten. Preferably, data should be available for the toxicity test organisms listed in Table 4-5 or at least one of the following three genera in the family Daphnidae—Ceriodaphnia sp., Daphnia sp., or Simocephalus sp. Other available information regarding the pesticide (such as but not limited to NOAECs and NOECs) may also be considered in light of the waters and the organisms involved to determine if lower concentrations are needed to ensure attainment of the narrative objectives. Calculation of a provisional value does not eliminate the need to obtain data sufficient to develop water quality criteria.~~

~~[NOTE TO REVIEWERS: The preceding paragraph (based on USEPA's *Technical Support Document for Water Quality-Based Toxics Control*) allows a NOEC/NOAEC to be estimated from a LC₅₀; however, it does not ensure that the available LC₅₀ is sufficiently sensitive that the resulting value is necessarily protective. The paragraph below is an alternative based on 40 CFR Part 132, Appendix A (applicable to the Great Lakes Region).]~~

~~Where valid tests have determined 96-hour LC₅₀ values for aquatic organisms (the concentration that kills one half of the test organisms in 96 hours), a provisional acute value for the protection of aquatic life may be calculated by dividing the lowest genus mean acute value (geometric mean of species mean acute values for a genus) by the factor in Table 4-x corresponding to the number of genus mean acute values available. A genus mean acute value should be available for at least one of the following three genera in the family Daphnidae—Ceriodaphnia sp., Daphnia sp., or Simocephalus sp. A provisional chronic value may be calculated by dividing the provisional acute value by 9.~~

TABLE 4.x
Factors for Calculating Provisional Values

<i>Number of Genus Mean Acute Values</i>	<i>Factor</i>
1	43.8
2	26.0
3	16.0
4	14.0
5	12.2
6	10.4
7	8.6

The following changes, shown in double underline/strikeout, apply to the section titled "CONTINUING PLANNING" in Chapter 4.

REGIONAL BOARD RESOURCE ALLOCATION

The items indicated below have been identified in this review as specific areas for which Water Board planning resources should be allocated. The items are divided into categories and each item is followed by an estimate of the frequency at which the item will be reviewed or the staff time and/or contract dollars needed to complete the item. Resolution of these items may result in future Basin Plan amendments.

TOTAL MAXIMUM DAILY LOAD	
<u>Review the Water Quality Attainment Strategy for Pesticide-Related Toxicity and TMDL for Diazinon and Pesticide-Related Toxicity in Urban Creeks, and evaluate new and relevant information from monitoring, special studies, and scientific literature. Determine if modifications to the targets, allocations, strategy goals or implementation plan are necessary.</u>	<u>Every 5 years</u>



Alameda Countywide Clean Water Program

A Consortium of Local Agencies

951 Turner Court, Hayward CA 94545-2698
(510) 670-5543 FAX (510) 670-5262

September 19, 2005

**Member
Agencies:**

Alameda

Albany

Berkeley

Dublin

Emeryville

Fremont

Hayward

Livermore

Newark

Oakland

Piedmont

Pleasanton

San Leandro

Union City

Alameda
County

Alameda
County
Flood Control
and Water
Conservation
District

Zone 7 of
the Alameda
County
Flood Control
District

Bill Johnson
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Bill:

**SUBJECT: COMMENTS ON THE DIAZINON AND PESTICIDE-RELATED TOXICITY
IN BAY AREA URBAN CREEKS WATER QUALITY ATTAINMENT
STRATEGY AND TMDL STAFF REPORT AND PROPOSED BASIN PLAN
AMENDMENT**

This letter is submitted by the Alameda Countywide Clean Water Program on behalf of its seventeen member agencies in response to the invitation to submit comments on the subject report (Report) dated August 5, 2005. ACCWP supports the comments on the Report submitted by BASMAA (letter dated September 19, 2005) on behalf of its member agencies and incorporates those comments by reference.

We strongly support the Report's emphasis on pollution prevention and believe that, if we are to be successful, consideration of water quality impacts must be more fully integrated into the federal and State pesticide registration process. As the Report points out, the source of the previously identified diazinon-related toxicity was the application of diazinon in accordance with label directions as authorized by the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation. If we are to avoid an endless cycle of responding to new pesticide-related water quality impacts, the potential impacts of urban pesticide use must be addressed before pesticides are registered for urban use.

We appreciate the effort that you and other Water Board staff have invested over many years to address pesticide-related toxicity in urban creeks. Thank you for your consideration of our comments.

Sincerely,

James Scanlin
Program Manager



**Santa Clara Valley
Urban Runoff
Pollution Prevention Program**

Campbell • Cupertino • Los Altos • Los Altos Hills • Los Gatos • Milpitas • Monte Sereno • Mountain View • Palo Alto
San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

Via Email and Hand Delivered

September 19, 2005

Mr. Bill Johnson
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks - Water Quality Attainment Strategy and Total Maximum Daily Load TMDL Proposed Basin Plan Amendment and Staff Report

Dear Mr. Johnson:

This letter is submitted on behalf of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) regarding the *Proposed Basin Plan Amendment (BPA) and Staff Report (Staff Report) for the Water Quality Attainment Strategy and TMDL for Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks*, dated August 5, 2005.¹ The SCVURPPP would like to thank you for this opportunity to comment on the Report and commend you for your hard work.

Over the past three years, staff persons on behalf of the SCVURPPP and/or the Bay Area Stormwater Management Agencies Association (BASMAA) have attended meetings and met directly with Water Board staff to discuss the implications of the proposed BPA on San Francisco Bay Area municipal urban runoff management agencies and suggest practical improvements to the BPA². The issues raised below, accompanied by constructive suggestions have previously been submitted by SCVURPPP and the Bay Area Stormwater Management Agencies Association (BASMAA) to the Water Board staff in comments submitted concerning each of the following documents related to the BPA (see Exhibit A for copies of previously submitted comments):

- **TMDL Preliminary Project Report** for Diazinon and Pesticide-Related Toxicity in San Francisco Bay Area Urban Creeks (dated September 2002);
- **Diazinon and Pesticide Related Toxicity in Bay Area Urban Creeks: Water quality Attainment Strategy and TMDL – Final Project Report** (dated March 2004);

¹ We request that this letter, the attached comments, and all previous documents and communications submitted with respect to this matter be included in this hearing record.

² During this process we have stressed the importance of providing safe harbor for Santa Clara municipalities, which are not the true sources of pesticides in that they do not regulate, manufacture, purchase and/or apply pesticides in significant amounts.

- **Draft Basin Plan Amendment Language** for Diazinon/Pesticide-Related Toxicity Urban Runoff (dated September 2, 2004).

Unfortunately, most of our previously-submitted recommendations appear to have been cast aside. On the major issues raised by SCVURPPP and BASMAA, a clear and meaningful response also has not been given, either directly or by means of revisions to the Staff Report or BPA. These issues include, but are not limited to:

Establishing a Clear Separation of the Diazinon TMDL and Pesticide-Related WQAS, and Developing Allocations for all Sources of Diazinon and Pesticide-Related Toxicity

The Staff Report and BPA continue to treat the diazinon TMDL and the pesticide-related toxicity water quality attainment strategy (WQAS) as if they were one in the same. While it is understandable to want to address both diazinon and the potential for other pesticide-related toxicity in one regulatory action, it is important that the action taken recognize and address the differences involved. The Clean Water Act section 303(d) listing of diazinon is based on existing facts and provides a federal mandate for the establishment of a TMDL to address it. No such federal mandate exists to justify a TMDL to address the *potential* for toxicity related to other pesticides, even if they may replace diazinon use in the future. Instead, concerns about toxicity related to the potential future use of pesticides other than diazinon is a State-led concern that needs to be addressed through the adoption of a non-TMDL provision (i.e., a WQAS) to the Basin Plan in accordance with the Water Code. The current intermingling between the diazinon TMDL and pesticide toxicity WQAS is a concern that has repeatedly been raised by SCVURPPP and BASMAA but which remains insufficiently addressed. In addition to being legally improper, this intermingling leads to unnecessary ambiguity and confusion, particularly in following four sections of the Staff Report and BPA. (Specific recommendations on how to address our concerns and increase the clarity of the TMDL and WQAS in the process have previously been submitted and are also provided below).

1) **Problem Statement**

Before establishing a WQAS, the Water Board should first identify what pesticides (if any, beyond diazinon) are currently impairing beneficial uses in urban creeks, and then identify the specific "upstream" sources of those pollutants. Without such an analysis, it will be impossible to effectively regulate the "true" sources (i.e., applicators of pesticides) of future pesticide-related toxicity in urban creeks, much less determine how municipal stormwater dischargers can help reduce pesticide-related toxicity. These impact and source assessments are especially important in this case, given the complex regulatory framework governing pesticides.

2) **Numeric Targets**

San Francisco Bay Area urban creeks have been listed on the 303(d) list for toxicity *attributable to diazinon*, which (in this case) necessitated the development of a TMDL for diazinon in urban creeks. As part of the TMDL process, numeric targets for diazinon (concentrations) have been developed and proposed in the Staff Report and BPA. Additionally, the Water Board staff has proposed generic toxicity targets that are not specific to diazinon. According to previous Water Board staff comments³, these generic toxicity targets are proposed for two reasons:

- a) The Water Board staff believes the proposed diazinon concentration targets alone do not address potential interactions between diazinon and other chemicals that may contribute to toxicity; and,

³ Water Board staff response to comments regarding ***Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks - Water Quality Attainment Strategy and Total Maximum Daily Load TMDL Final Project Report***, dated December 16, 2004.

- b) The proposed diazinon concentration targets alone do not address the potential for the pesticides replacing diazinon to threaten water quality.

Relative to (a) above, the proposed diazinon concentration targets (chronic and acute) are the most sensitive criterion currently developed (see Staff Report, page 61) and therefore take into account an implicit margin of safety that will be protective of water quality even if interactions occur with other chemicals.

Relative to (b) above, the potential for future, non-diazinon pesticide-related toxicity is a legitimate Regional Board concern that SCVURPPP and BASMAA understand should be addressed. However, the TMDL for diazinon in San Francisco Bay Area Urban Creeks is not the appropriate vehicle to address this concern. While toxicity related to diazinon replacement pesticides that may be registered in the future exists in other areas, because addressing this via a TMDL is not part of the federal statute's mandate, U.S. EPA did not, for example, go beyond the section 303(d) listings of chlorpyrifos, diazinon, and delineated organochlorine pesticides when it developed *and approved* a TMDL in Newport Bay.⁴ Rather than continue its current objectionable approach that goes beyond the Clean Water Act's authorization for TMDLs, the Water Board staff should look towards the existing Basin Plan narrative water quality objective for toxicity and development of a water quality attainment strategy for non-diazinon-related pesticide toxicity consistent with the California Water Code.⁵

3) Allocations

Allocations for diazinon and pesticide-related toxicity in urban creeks are assigned to "storm drains," which are mostly owned and operated by Bay Area municipalities in the urbanized areas. Not only are "allocations" for non-diazinon pesticide related toxicity beyond the scope of the Clean Water Act and, hence, inappropriate,, even as applied to diazinon alone, the allocation disregards the "true" sources of diazinon - the applicators themselves. Consistent with EPA TMDL Guidance⁶ allocations for diazinon should be expressed by pollutant discharge process (i.e., urban storm runoff), rather than discharge location (i.e., storm drains) because of the diffuse nature of stormwater runoff and lack of regulatory oversight municipalities have in prohibiting the use of pesticides⁷. Once the allocation is assigned to "urban storm runoff", all "true" sources of diazinon (e.g., pest control operators) should be identified and assigned allocations.

4) Implementation Plan

Intermingling between the WQAS and TMDL results in confusion in the implementation plan language and impedes our ability to fully analyze its potential consequences. It is currently not clear which activities relate to the TMDL versus the WQAS. Additionally, the mixing of the WQAS for pesticide-related toxicity and the diazinon TMDL has lead to inappropriate assumptions regarding future pesticide sources. Some of the implementation actions appear to be based on the assumption that the sources and pathways of future pesticide-related toxicity in urban streams will be similar to the sources and pathways of diazinon related toxicity. That assumption is not necessarily realistic and should not be made absent evidence. As you know, new pesticides are constantly being brought to market and gaining market share while others are losing market share. We cannot predict what the pesticide market will look like in ten or twenty

⁴ <http://www.epa.gov/Region9/water/tmdl/nbay/summary0602.pdf>; <http://www.epa.gov/Region9/water/tmdl/nbay/tsdc0602.pdf>; <http://www.epa.gov/Region9/water/tmdl/nbay/tsdi0602.pdf>

⁵ Among other things, the WQAS must comply with California Water Code, Section 13241.

⁶ *Guidance for developing TMDLs in California*, EPA Region 9, January 7, 2000.

⁷ Food and Agriculture Code (Section 11505.1) prohibits local municipalities from regulating the registration, sale or use of pesticides.

years, what the physical properties of those pesticides will be, or which applications may be causing water quality impacts.

Recommendations – Again, we request that the Report and BPA language be revised so the diazinon TMDL, including recommended targets, allocations, and implementation actions, can be clearly separated from the WQAS for pesticide-related toxicity. This can be done by revising the Report to include separate sections for the diazinon TMDL and the WQAS for pesticide-related toxicity, or by developing two separate reports. The TMDL is for 37 Bay Area creeks listed on the 303(d) list due to toxicity attributable to diazinon. This listing does not apply to all pesticide-related toxicity, which, if present, should be covered under a separate WQAS for this broader potential issue.

These unresolved issues are further discussed in our previously submitted comments, which are attached as Exhibit A. Additionally, recommended revisions to the proposed BPA language are also included in a previously submitted “redline strikethrough” version of the BPA attached as Exhibit B.

SCVURPPP believes that not revising the Staff Report and BPA to incorporate these recommended improvements will most definitely place an undue burden on public agencies in the Bay Area by requiring resource consuming implementation actions that are misdirected. If our recommendations are not presented to the Board and adopted, we recommend that the Executive Officer postpone consideration of the BPA at this time and instead work with Bay Area stakeholders to substantially revise the Staff Report and BPA.

The SCVURPPP is in support and incorporates by reference the comments submitted by the BASMAA and the City of San Jose. Please contact me at (510) 832-2852 if you have any questions regarding the comments or suggested changes.

Sincerely,

Adam W. Olivieri, Dr.PH, P.E.
SCVURPPP Program Manager

CC: Bruce Wolfe
Tom Mumley
Dorothy Dickie
SCVURPPP Management Committee
SCVURPPP Legal Steering Group
BASMAA Executive Board

EXHIBIT “A”

March 7, 2003

Ms. Loretta Barsamian
Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Comments on the Total Maximum Daily Load (TMDL) Preliminary Project Report for Diazinon and Pesticide-Related Toxicity in San Francisco Bay Area Urban Creeks, dated September 2002.

Dear Ms. Barsamian:

The following comments are being submitted by BASMAA on behalf of its member stormwater programs throughout the Bay Area. We thank you for the opportunity to provide preliminary comments on the *Total Maximum Daily Load (TMDL) Preliminary Project Report for Diazinon and Pesticide-Related Toxicity in San Francisco Bay Area Urban Creeks (Preliminary Project Report)*, dated September 2002. BASMAA appreciates the time and resources the San Francisco Bay Regional Water Quality Control Board (Board) staff has dedicated to developing the preliminary project report.

While BASMAA supports a proactive cost-effective approach to controlling diazinon and other pesticide pollutants through municipal stormwater permits, we believe it is critically important for the Regional Board to recognize that municipal storm sewers are not the source of pesticide-related toxicity impairment in Bay Area creeks. Rather, like the creeks themselves, municipal storm sewers are recipients of pesticide pollutant residues generated from other sources, and, accordingly, the Regional Board must utilize its regulatory authorities to address such “upstream” sources, particularly in a TMDL.¹

The information presented in the *1998 Clean Water Act Section 303(d) List of Water Quality Limited Segments* indicates that diazinon is causing water quality problems in thirty-five (35)

¹This is not to say that municipal storm sewer systems do not have a role to play in addressing these issues. As you know, BASMAA and a number of its members have developed and/or contributed to a variety of activities over the past ten years aimed at characterizing and eliminating pesticide-related toxicity in stormwater. These efforts have and currently include: significant outreach efforts to residents, businesses, and municipal staff to achieve behavior changes related to pesticide use; development and implementation of monitoring studies to characterize concentrations of priority pesticides (e.g., diazinon) and toxicity in urban runoff; and participation in regional organizations (e.g., Clean Estuary Partnership and RMP) addressing pesticide-related issues. These efforts demonstrate the BASMAA member stormwater program commitment to reduce water quality impacts related to pesticides and, in particular, diazinon.

San Francisco Bay Area urban creeks. Accordingly, we acknowledge that the Clean Water Act requires development of a TMDL to address this 303(d) listing. BASMAA is concerned, however, with the language and content of the Preliminary Project Report and its expanded scope. The following paragraphs describe these concerns in detail and offer suggestions on how to improve the language/content of the preliminary project report in preparation for proposing a TMDL and, possibly, a related Basin Plan Amendment. Our specific concerns with the report are regarding the following points:

- The expansion of the TMDL for diazinon in 35 (or based on the State's more recent 303(d) listing, 37) Bay Area urban creeks to include "pesticide-related toxicity" goes beyond the requirements of the Clean Water Act and the basis for these 303(d) listings;
- The proposed numeric toxicity targets go beyond diazinon and, hence, are inconsistent with and go beyond the 303(d) listing;
- The proposed allocation scheme ignores the real sources of diazinon discharges, fails to assign load allocations to these point and non-point sources, and unfairly seeks to place the entire burden for regulating these sources on municipal storm water programs. It also ignores the potential use of the Regional Board's own substantial authorities to regulate these true sources of the problem.
- The implementation plan ignores the fact that the U.S. EPA phase-out of diazinon's registration will address the appropriate share of diazinon loadings assigned to municipal storm water programs. In so doing, it proposes to waste scarce municipal resources on a problem whose solution (in terms of municipal storm water programs' responsibilities is already scheduled to be implemented.)

The expansion of the TMDL for diazinon in San Francisco Bay Area urban creeks to include "pesticide-related toxicity" goes beyond the basis for the 303(d) listing

In the 1999, the State Water Resources Control Board (SWRCB) designated 35 urban creeks in the San Francisco Bay Area impaired by the organophosphate pesticide diazinon pursuant to Section 303(d) of the Federal Clean Water Act. More recently, the SWRCB increased the number of urban creeks impaired by diazinon to 37. These "303(d)" listings were specific to "urban creeks" and specific to impairment by the organophosphate pesticide "diazinon." TMDLs must be consistent with those water body segments and associated pollutants identified by the State (See 40 C.F.R. 130.7(c)(1)). Therefore, the development of a TMDL that includes "pesticide-related toxicity" in urban creeks appears to be overreaching and inconsistent with the Federal Clean Water Act. Furthermore, to our knowledge, pesticide-related toxicity (aside from diazinon) in Bay Area urban creeks has not been established, nor has a proposed listing via Section 303(d) been subject to public comment or approved by the State and/or EPA. Accordingly, the preliminary project report should not contain language regarding "pesticide-related toxicity" or attempt to incorporate all pesticides under the proposed diazinon TMDL.

In providing the preceding comment, it is important to note that the BASMAA members share the Regional Board's concern that toxicity related to pesticides other than diazinon may occur in

the future. Of particular interest are those pesticides that have a high probability of gaining market share with a phase-out of urban uses of diazinon, and have a high potential to cause adverse water quality impacts. As mentioned at the outset of this letter, significant municipal resources are currently being spent on these concerns. The BASMAA members are currently implementing a variety of management actions in our Pesticide Management Plan that are aimed at minimizing the use and reducing the amount of pesticides in stormwater runoff to the maximum extent practicable. Based on these efforts, we believe ongoing programs are currently in place to address emerging pesticides that may replace diazinon. These programs need not be and should not be encumbered by the additional regulatory overlay and burdens of a TMDL.

The proposed numeric toxicity targets for diazinon in Bay Area urban creeks goes beyond the basis for the 303(d) listing

Developing a numeric target(s) is an integral part of the TMDL process. The preliminary project report proposes four (4) numeric targets. Two diazinon concentration targets (acute and chronic) and two targets (acute and chronic) based on toxicity units. However, as previously discussed, the Preliminary Project Report, including its numeric targets, should be limited to the pollutant identified on the Clean Water Act 303(d) list as causing the impairment (i.e., diazinon). Using toxicity targets in addition to the two diazinon concentration targets is inconsistent with guidance from the United States Environmental Protection Agency (U.S. EPA 2000), which states “...targets should identify the specific instream goals or endpoints for the TMDL, which equate to attainment of the water quality standard” (i.e., the water quality objective for diazinon itself). While the BASMAA members are also concerned about the possibility that new pesticides could become a problem in the future, it is beyond the scope of the State’s 303(d) listing to address this issue and, accordingly, the numeric criteria based on toxicity units should be removed from any proposed diazinon TMDL for urban creeks.

The proposed allocation scheme ignores the real sources of diazinon discharges

The preliminary project report proposes a single load allocation for “storm drains” and then inconsistently states that “...many parties bear responsibility for pesticide discharges through storm drains.” The report goes on to identify structural pest control operators, professional landscapers, and agriculture (along with residential consumer users of diazinon) as sources of diazinon discharges, and it lists the U.S. EPA and the California Environmental Protection Agency (including the SWRCB, RWQCB, and California Department of Pesticide Regulation) as agencies with significant implementation roles. However, the report does not assign any waste load or load allocations to any of the business entities it identifies as sources, and it excludes the California Department of Transportation (CalTrans) and other entities covered under the SWRCB’s General Storm Water permits for construction or industrial activities. The Preliminary Project Report’s failure to assign waste load and load allocations to all of these identified sources and to instead attempt to place 100% of responsibility on the very municipalities that have committed to and are financing and undertaking early implementation actions is both inconsistent with the Clean Water Act and bad public policy. Furthermore, such an allocation strategy makes no sense. As the Preliminary Project Report already recognizes

municipal stormwater programs do not have the authority to oversee pesticide applications and accordingly the proposed allocation “would pose a significant compliance liability for municipalities with stormwater permits, wherein the municipalities are accountable for the presence of the pesticides in their discharges but do not have the authority to regulate pesticide applications.” Accordingly, we recommend substantially reducing the allocation currently proposed for municipal storm water permittees and that instead other entities such as structural pest control operators, professional landscapers, and agriculture, as well as businesses covered under the SWRCB’s general permits for construction and/or industrial activities and CalTrans be specifically assigned waste load and load allocations (i.e., depending on whether they are technically classified as point or non-point sources) and included in the overall allocation scheme and implementation plan. This would help relieve the grossly disproportionate burden that has otherwise been placed on stormwater programs.)

The Proposed Implementation Plan ignores the effects of U.S. EPA’s schedule phase-out of diazinon’s registration

Although not discussed in the preliminary project report, water quality-based effluent limits (WQBELs) arising from the diazinon TMDL for urban creeks are of particular interest to BASMAA member programs. Stormwater discharges are highly variable in frequency and duration and are not easily characterized, making it difficult to determine with precision or certainty actual and projected loadings. Additionally, public agencies have limited authority and resources that can be directed towards pesticide reduction and a reasonable balance between monitoring, public outreach/education, and management activities must be achieved. In particular, monitoring efforts associated with reducing uncertainty to the point where compliance with numeric targets can be determined may be extremely costly and potentially reduce resources available for management and public outreach/education efforts. This is especially true with costly water/sediment toxicity tests and associated toxicity identification evaluations. For these and other reasons, 33 U.S.C. §1342(p)(3)(B)(iii) does not authorize the application of WQBELs to municipal separate storm sewer programs. *See Defenders of Wildlife v. Browner* (9th Cir. 1999) (rejecting the application of WQBELs to MS4’s and instead recognizing section 402(p)(3)(B)(iii)’s maximum extent practicable standard, including “such” additional MEP controls as may be imposed at the discretion of U.S. EPA or a state.

U.S. EPA recommends and BASMAA strongly supports that where TMDLs suggest some allocation to municipal storm water programs, the implementation measures addressing them be expressed as best management practices (BMPs), not numeric limits. As you know, the BASMAA members are currently implementing a variety of management actions as described in our Pesticide Management Work Plan. These actions are aimed at minimizing the use and reducing the amount of pesticides in stormwater runoff to the maximum extent practicable. In light of the extensive pesticide reduction activities being implemented and U.S. EPA’s scheduled phase-out of diazinon, we strongly recommend that the current BMPs being implemented as part of the BASMAA members Pesticide Management Plans serve as the proposed TMDL implementation plan for the Bay Area stormwater programs. Once allocations are developed and assigned to the real sources of these pollutants (i.e., sources other than homeowners who use

pesticides), appropriate implementation measures, potentially including NPDES permits or Waste Discharge Requirement, with numeric effluent limitations and/or BMP should be identified for them.

* * * * *

In summary, BASMAA believes that prior to RWQCB consideration of approval of the draft TMDL report and the potential adoption of a Basin Plan amendment the Preliminary Project Report needs to first be revised to address the above issues. We thank you for the opportunity to provide preliminary comments. We look forward to receiving and discussing your responses and to working with your staff to develop an approvable TMDL for diazinon in urban creeks in the Bay Area.

Sincerely,

Originally Signed by

Donald P. Frietas
BASMAA Chairperson

cc: BASMAA Executive Directors



B A S M A A

Alameda Countywide
Clean Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Stormwater Pollution
Prevention Program

Santa Clara Valley
Urban Runoff Pollution
Prevention Program

Vallejo
Sanitation and Flood
Control District

April 12, 2004

Bill Johnson
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subject: Comments on the Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks: Water Quality Attainment Strategy and Total Maximum Daily Load (TMDL) - Final Project Report

Dear Bill:

This letter is submitted on behalf of the Bay Area Stormwater Management Agencies Association (BASMAA) in response to the invitation to submit comments on the subject report (Report). We first want to commend you and the other Regional Water Board staff members for all the work that has gone into drafting the Report and we appreciate the opportunity to provide comments. As you know, BASMAA has been intimately involved in the effort to identify and characterize the sources of and develop solutions to the problem of pesticide-related toxicity in Bay Area urban creeks for over ten years. We are submitting these comments in part because of concerns we have regarding the impact of subsequent related Basin Plan amendments may have on our programs and agencies but primarily because, like the Regional Water Board, we are interested in eliminating pesticide-related toxicity in our creeks.

BASMAA has three general comments on the Report:

- (1) the distinction between the water quality attainment strategy and the TMDL should be much more clearly delineated;
- (2) the implementation plan for the TMDL should be developed and adopted through a separate process from the development and adoption of the TMDL; and
- (3) all potential sources of diazinon and pesticide-related toxicity in urban creeks should be separately addressed.

These items are explained in detail below. We also have included additional recommendations for specific revisions as an attachment.

1. Clearly separate the TMDL from the Water Quality Attainment Strategy

The Report is an improvement over the Preliminary Project Report (dated September 2002) in that it explicitly states that the TMDL is for diazinon only and does not include pesticide-related toxicity. However, the Report continues to treat the diazinon TMDL and the pesticide-related toxicity water quality attainment strategy (WQAS) as if they were one in the same. This intermingling leads to unnecessary ambiguity, particularly in three sections of the report:

Bay Area

Stormwater Management

Agencies Association

1515 Clay Street

Suite 1400

Oakland, CA 94612

510.622.2326

www.basmaa.org

- 1) **Numeric Targets** – pesticide-related toxicity is inappropriately addressed under the TMDL through the development of generic toxicity targets that are not specific to diazinon and therefore are beyond the scope of the diazinon TMDL;
- 2) **Allocations** – the recommended wasteload allocations for urban runoff reference the generic toxicity targets which are not specific to diazinon and therefore are beyond the scope of the diazinon TMDL; and,
- 3) **Implementation Plan** – it is not clear which activities relate to the TMDL versus the WQAS.

Additionally, the mixing of the WQAS for pesticide-related toxicity and the diazinon TMDL has lead to inappropriate assumptions. For example, some of the implementation actions appear to be based on the assumption that the sources and pathways of future pesticide-related toxicity in urban streams will be similar to the sources and pathways of diazinon related toxicity. We should not make that assumption. As you know, new pesticides are constantly being brought to market and gaining market share while others are losing market share. We cannot predict what the pesticide market will look like in ten or twenty years, what the physical properties of those pesticides will be, or which applications may be causing water quality impacts.

We recommend that the Report be revised so the diazinon TMDL, including recommended targets, allocations, and implementation actions, can be clearly separated from the WQAS for pesticide-related toxicity. This can be done by revising the Report to include separate sections for the diazinon TMDL and the WQAS for pesticide-related toxicity, or by developing two separate reports.

2. Separate the Implementation Plan from the TMDL

Neither the Clean Water Act nor the U.S. Environmental Protection Agency's (USEPA) regulations require the State Water Resources Control Board or the Regional Water Boards to seek USEPA approval of TMDL implementation plans. TMDL implementation is instead largely a function of state law. By combining the TMDL and the Implementation Plan, the Report blurs this distinction, and thereby will likely undermine the State's authority and flexibility with regard to TMDL implementation. The Regional Board should instead, separate the establishment of the "technical" TMDL (*i.e.*, the calculation of acceptable loading and allocations) from the development of TMDL implementation policies, actions, and schedules.

Sections 13241 and 13242 of the Porter Cologne Act, governs the implementation of TMDLs. The Porter Cologne Act requires Regional Water Boards to consider factors in addition to the considerations mandated by the CWA. When developing implementation plans for TMDLs, the Regional Water Board must take into account beneficial uses of the impaired waters, environmental characteristics of the hydrographic unit under consideration, reasonable limitations on water quality conditions, economic considerations, the need for developing housing, and the need to develop and use recycled water. (Water Code § 13241.) In contrast, USEPA is not required to consider all the factors identified by the Porter Cologne Act.

Stormwater agencies have generally been supportive of linking implementation planning with TMDL development, however by mixing the process of establishing (developing and approving) TMDLs with the process of developing TMDL implementation plans, the Regional Board effectively risks ceding substantial State authority and discretion to the federal government.

Therefore, in order to maintain the flexibility and independence for the Regional Water Board to implement the TMDL in accordance with the considerations required by the Porter Cologne Act, the Regional Water Board should separate the process into two parallel stages and documents, developing the “technical” TMDL and submitting it to USEPA for approval, and developing the TMDL implementation plan in a separate step of the process in which USEPA approval is not required. Separating the “technical” TMDL from the implementation plan would also help to eliminate some of the ambiguity discussed above in item one.

3. Develop Allocations for all Sources of Diazinon and Separately Identify all Sources of Pesticide-Related Toxicity

The diazinon TMDL and the WQAS for pesticide-related toxicity do not address sources other than municipal storm drain systems. The Report states that “the only source of pesticides in Bay Area urban creeks is essentially urban runoff from storm drains.” As the use of the word “essentially” indicates, there are other sources, and in the future these other sources may be as or more significant than discharges from municipal storm drain systems. The fact that these other sources have not as yet been identified as causing significant problems does not mean that they will not be identified in the future. Many or most urban creeks in the Bay Area have their headwaters in rural areas. Some of these rural areas have extensive agricultural activity occurring in them. We may find that pesticide applications on these agricultural lands are causing toxicity problems downstream in “urban” creeks. Many of these “urban” creeks also have water supply reservoirs upstream. These reservoirs are often treated with pesticides to control algal growth and there have been instances where these pesticides have been detected downstream in significant concentrations. In addition, the Report states that diazinon is not conveyed through groundwater due to its relatively low solubility and the anticipated replacement pesticides are even less soluble. However, imidacloprid is currently registered for use for injection into the soil for termite control as well as for lawn and garden use. Imidacloprid is far more soluble than diazinon and is on the California Department of Pesticide Regulation’s Groundwater Contaminant List. If imidacloprid gains significant market share, groundwater conveyance could be a significant source of pesticide-related toxicity.

In addition to these potential future scenarios, there may be current sources of diazinon in Bay Area urban creeks other than those conveyed by urban runoff. The Report states that “Some agricultural pesticide use does occur within the Water Board’s jurisdiction, but it is a negligible contributor”, and notes that “...less than 2% of all the reported and unreported diazinon use in the Bay Area that year” [2000] was for agricultural purposes in the nine Bay Area counties. Normally, less than 2% might be negligible, but given the research that shows it takes less than a fluid ounce of active ingredient to cause toxicity in urban creeks, no source can be considered negligible or insignificant. Given the miniscule amounts of diazinon it takes to cause an impact, using the approach toward sources described in the Report, it is very possible that all sources of diazinon to urban runoff could be eliminated and there would still be diazinon in urban creeks. After December 2004, the following uses of diazinon will still be allowed: use for food crops, fruit trees, ornamental nurseries, cut flowers, cattle, and squirrels.

We therefore recommend that all potential point and non-point dischargers to urban creeks: (1) be assigned equivalent concentration-based allocations in the diazinon TMDL; and, (2) be separately addressed in the WQAS for pesticide-related toxicity.

Thank you again for this opportunity to comment on the Report. We look forward to continuing to work with you on this issue. Please contact me at (925) 313-2373, Jim Scanlin (510) 670-6548, or Geoff Brosseau (510) 622-2326 if you have any questions regarding the comments or suggested changes.

Sincerely,

A handwritten signature in black ink, appearing to read "Donald P. Freitas". The signature is fluid and cursive, with a large, stylized 'F' and 'D'.

Donald P. Freitas
BASMAA Executive Board Chair

Attachment: Additional BASMAA comments

cc: Jim Scanlin, ACCWP / CEP Diazinon Work Group
Geoff Brosseau, BASMAA
Arleen Feng, BASMAA Monitoring Committee / CEP Technical Committee
BASMAA Executive Board
Robert Hale, ACCWP
Kevin Cullen, FSURMP
Liz Lewis, MCSTOPPP
Bob Davidson, SMCSTOPPP
Adam Olivieri, SCVURPPP
Emily Dean, SCWA
Jack Betourne, VSFCD
BASMAA Monitoring Committee Representatives
Tom Mumley, SFBRWQCB
Bruce Wolfe, SFBRWQCB
Dale Bowyer, SFBRWQCB
Andy Gunther, Clean Estuary Partnership

These specific comments are in addition to the general comments in the April 12, 2004 BASMAA comment letter.

1) Clearly distinguish the TMDL scope from the WQAS scope

BASMAA recommends that these scopes be clearly stated, for example as graphic or a simple set of bullets:

WQAS is larger scope and includes the TMDL scope

- for all Bay Area urban creeks
- pesticide-related toxicity

TMDL

- 37 Bay Area urban creeks
- diazinon

2) Determine what the goals or focus of the WQAS, TMDL, and as needed the individual parts (e.g., Implementation Plan, Monitoring and Adaptive Implementation) are; and then use consistent terminology and phraseology to describe them.

The use of different terms and phrases will lead to misinterpretations and misunderstandings now and over the long course of implementation. Examples of inconsistent use of terms and phrases are (within each set of colored text, different terms and phrases are being used to make what appear to be the same statement):

Summary

(p. S-1) ...a strategy to **eliminate** **pesticide-related toxicity** from **Bay Area urban creeks**.

(p. S-1) The water quality attainment strategy **addresses** **water quality threats posed by pesticides** discharged to **urban creeks**.

(p. S-1) ...the overarching water quality attainment strategy that **addresses** **general water quality threats posed by pesticides**.

Summary – Implementation Plan

(p. S-3) The over-arching strategy for **reducing** **pesticide-related toxicity** in **urban runoff** is to avoid the use of conventional pesticides that threaten water quality.

Implementation Plan

(p. 77) The strategy is intended to **prevent** **pesticide discharges that impair** **water quality**.

Monitoring and Adaptive Implementation

(p. 91) Analytical... tests will focus on **pesticides that pose substantial water quality risks** and for which commercially viable analytical methods are available).

Attachment: Additional BASMAA comments on the Diazinon TMDL and Pesticide-Related Toxicity WQAS in Bay Area Urban Creeks Final Project Report

BASMAA recommends the following terms be used throughout the TMDL and WQAS documents, and that these sentences and other similar ones be revised to use these terms:

implement (or attain) the applicable water quality standard (this phraseology is from the CWA and the CEP MOU)

pesticide-related toxicity

Bay Area urban creeks

EXHIBIT “B”

PROPOSED BASIN PLAN AMENDMENT

The following changes, shown in double underline/strikeout, apply to the section titled "TOXICITY" in Chapter 3.

Toxicity

All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms. Detrimental responses include, but are not limited to, decreased growth rate and decreased reproductive success of resident or indicator species. There shall be no acute toxicity in ambient waters. ~~As~~ In the context of municipal and industrial wastewater discharges, acute toxicity is defined as a median of less than 90 percent survival, and less than 70 percent survival, 10 percent of the time, or of test organisms in a 96-hour static or continuous flow test.

There shall be no chronic toxicity in ambient waters. Chronic toxicity is a detrimental biological effect on growth rate, reproduction, fertilization success, larval development, population abundance, community composition, or any other relevant measure of the health of an organism, population, or community. Chronic toxicity generally results from exposures to pollutants exceeding 96 hours. However, chronic toxicity may also be detected through short-term exposure of critical life stages of organisms.

~~As~~ Attainment of this objective will be evaluated on the basis of available information. Such information may include numeric criteria and guidelines for toxic substances such as those developed by other California agencies, the U.S. Environmental Protection Agency, and the National Academy of Sciences. In the context of municipal and industrial wastewater discharges, at a minimum, compliance will be evaluated using the bioassay requirements contained in Chapter IV.

Deleted: Compliance with

The health and life history characteristics of aquatic organisms in waters affected by controllable water quality factors shall not differ significantly from those for the same waters in areas unaffected by controllable water quality factors.

The following text, in its entirety, is to be inserted in Chapter 4, immediately after the introduction of the section titled "TOXIC POLLUTANT MANAGEMENT IN THE LARGER SAN FRANCISCO BAY ESTUARY SYSTEM." For clarity, it is not shown with double underline.

Water Quality Attainment Strategy for Pesticide-Related Toxicity and TMDL for Diazinon in Urban Creeks

The following sections establish a water quality attainment strategy for pesticide-related toxicity (strategy) and a TMDL for diazinon, (TMDL) in the Region's urban creeks, including actions and monitoring necessary to implement the strategy and TMDL. "Pesticides" are substances (or mixtures of substances) intended for defoliating plants, regulating plant growth, or preventing, destroying, repelling, or mitigating pests that may infest or be detrimental to vegetation, humans, animals, or households, or be present in any agricultural or nonagricultural environment. "Urban creeks" are creeks that flow through urban areas, including incorporated cities and towns and unincorporated areas with similar land use intensities. This strategy applies to all San Francisco Bay Region urban creeks, including but not limited to those named in Table 4.z.

Deleted: and Pesticide-Related Toxicity

Deleted: and pesticide-related toxicity

Deleted: portions of

The numeric targets, allocations, strategy goals and implementation plan described below will ensure that urban creeks attain applicable water quality standards established to protect and support beneficial uses. This strategy and the TMDL will also reduce pesticide discharges to the Bay from urban creeks. The effectiveness of the implementation actions, the monitoring undertaken to track progress toward targets and strategy goals, and the most current scientific understanding pertaining to pesticide-related toxicity will be periodically reviewed, and the strategy and, if appropriate, TMDL, will be adapted as necessary to reflect changing conditions and information.

Problem Statement

In 1998, a number of the Region's urban creeks were placed on the 303(d) list of impaired waters due to toxicity attributed to diazinon. In the early 1990s, many of the Region's urban creek water samples were toxic to aquatic organisms. Studies found that pesticides, particularly diazinon, caused the toxicity. When pesticide-related toxicity occurs in urban creek water or sediment, creeks do not meet the narrative toxicity objective. When pesticide-related toxicity occurs in sediment, the creeks also do not meet the narrative sediment objective. Urban creek waters that fail to meet these objectives are not protective of cold and warm freshwater habitats.

Although, the U.S. Environmental Protection Agency phased out urban diazinon applications at the end of 2004, other pesticides may also pose potential water quality and sediment quality concerns because current gaps in pesticide registration, programs could, in the absence of appropriate consideration, allow pesticides to be used in ways that threaten water quality.

Deleted: ulatory

TABLE 4.z
Urban Creeks

County	Creek		
<i>Alameda County</i>	Alameda Creek*	Codornices Creek	San Lorenzo Creek*
	Arroyo de la Laguna*	Crandall Creek	Sausal Creek
	Arroyo de las Positas*	Dry Creek	Strawberry Creek
	Arroyo del Valle*	Laguna Creek	Sulphur Creek
	Arroyo Mocho*	Peralta Creek	Temescal Creek
	Arroyo Viejo	San Leandro Creek*	Ward Creek
<i>Contra Costa County</i>	Baxter Creek	Pine Creek*	Rodeo Creek*
	Cerrito Creek	Pinole Creek*	San Pablo Creek*
	Garrity Creek	Refugio Creek	Walnut Creek*
	Mount Diablo Creek*	Rheem Creek	Wildcat Creek*
<i>Marin County</i>	Arroyo Corte Madera del Presidio*	Coyote Creek*	Novato Creek*
		Gallinas Creek*	San Antonio Creek*
	Corte Madera Creek*	Miller Creek*	San Rafael Creek*
<i>San Mateo County</i>	Belmont Creek	Laurel Creek	San Bruno Creek
	Colma Creek	Mill Creek	Sanchez Creek
	Cordilleras Creek	Pulgas Creek	San Mateo Creek*
<i>Santa Clara County</i>	Calabazas Creek*	Matadero Creek*	San Francisquito Creek*
	Coyote Creek*	Permanente Creek*	Saratoga Creek*
	Guadalupe River*	San Felipe Creek*	Stevens Creek*
	Los Gatos Creek*		
<i>Solano County</i>	Laurel Creek*	Ledgewood Creek*	Suisun Slough*
<i>Sonoma County</i>	Petaluma River* [†]		

* Creek designated as impaired pursuant to Clean Water Act §303(d) due to toxicity attributed to diazinon.

[†] Many of the creeks listed, including, Petaluma River, drain substantial agricultural and other non-urban areas. [NOTE: MAY NOT WANT TO SUGGEST TO EPA THAT TMDL DOESN'T ADDRESS ALL SOURCES.]

Deleted: The

Deleted: s

Deleted: ; therefore, the TMDL may not fully address all its pesticides sources

Deleted: However, the strategy does apply to the urban portion of the Petaluma River to address its urban sources.

Numeric Targets and Strategy Goals

The numeric targets and strategy goals below translate the narrative toxicity and sediment objectives into quantitatively measurable water quality parameters. Meeting these pesticide-related toxicity goals and diazinon concentration targets will protect cold and warm freshwater habitats. As indicated above, pursuant to the TMDL and the strategy, the diazinon target shall be addressed at all urban creek locations, including those near storm drain outfalls where urban runoff enters receiving waters.

Deleted: These

Deleted: s

Deleted: met

Toxicity

The toxicity goals are expressed in terms of acute toxic units (TU_a) and chronic toxic units (TU_c). The goals of the strategy are that pesticide-related acute and chronic toxicity in urban creek water and sediment, as determined through standard toxicity tests, shall not exceed 1.0 TU_a or 1.0 TU_c, where TU_a = 100/NOAEC and TU_c = 100/NOEC. "NOAEC" is the no observed adverse effect concentration, which is the highest tested concentration of a sample that causes no observable adverse effect (i.e., mortality) to

Deleted: targets

Deleted: P

exposed organisms during an acute toxicity test. “NOEC” is the no observable effect concentration, which is the highest tested concentration of a sample that causes no observable effect to exposed organisms during a chronic toxicity test. NOAEC and NOEC are both expressed as the percentage of a sample in a test container (e.g., an undiluted sample has a concentration of 100%). In both cases, an observable effect must be statistically significant and at least 20% greater than observed in control samples.

These numeric toxicity goals and related methodologies do not limit the Water Board’s authority to evaluate attainment of the narrative objectives through other appropriate means.

Deleted: targets

Deleted: compliance with

The above definitions of TU_a and TU_c apply only to ambient conditions in the context of this pesticide-related toxicity strategy. They do not necessarily apply to Table 4-6, which relates to wastewater effluent.

Deleted: diazinon TMDL and

Inserted: TMDL

Diazinon

The numeric target for the TMDL is that diazinon concentrations in urban creeks shall not exceed 100 ng/l during any one-hour period more than once every three years.

Deleted: D

Sources

Pesticides, including diazinon, enter urban creeks through urban runoff discharged from storm drains. Urban runoff contains pesticides as a result of pesticides being manufactured, formulated into products, and sold through distributors and retailers to businesses and individuals who apply them for structural pest control, landscape maintenance, agricultural, and other pest management purposes. Factors that affect pesticide concentrations in urban creeks include the amount used, the chemical and physical properties of the pesticide as formulated into a product, the sites of use (e.g., landscaping, turf, or paved surfaces), and irrigation practices and precipitation. In the San Francisco Bay Region, ants are the most common pest problem for which pesticides are used. Pesticide use by structural pest control professionals and use of products sold over-the-counter can be among the greatest contributors to pesticides in urban runoff.

Deleted: primarily

Deleted: R

Deleted: urban

Total Maximum Daily Load and Related Aspects of the Strategy

The assimilative capacity of San Francisco Bay Region urban creeks for diazinon is the amount of diazinon they can receive without violating water quality standards. For the urban creeks to assimilate diazinon and meet water quality standards, the targets must be met. Similarly, for urban creeks to assimilate other pesticide discharges and meet applicable water quality standards, the strategy goals will need to be addressed.

Deleted: and pesticide-related toxicity

Deleted: and pesticide-related toxicity

Deleted: and other pesticide discharges

Rather than establish a mass-based TMDL to attain the targets, the TMDL is expressed in concentration units, i.e., “diazinon concentrations in urban creeks shall not exceed 100 ng/l during any one-hour period more than once every three years.” Thus, because concentration unit (rather than mass) is being used, the TMDL is equal to the targets.

Deleted: for diazinon

Inserted: for diazinon

Deleted: s

Deleted: concentration units

Inserted: concentration units

Deleted:

The targets rely on a conservative approach that provides an implicit margin of safety to account for any lack of knowledge concerning the relationship between the allocations and water quality. Weather and seasons affect creek flows and pesticide loads,

concentrations, and toxicity. By expressing the strategy goals and targets in terms of toxicity and diazinon concentrations respectively, the inherent pesticide and diazinon mass loads automatically reflect seasonal and other critical conditions as creek conditions change.

Deleted: s

Allocations and Related Aspects of the Strategy

The TMDL is allocated to all urban storm drains and to [insert list of other point and non-point sources to which the diazinon concentration limit should be applied, e.g., landscape operators, pesticide applicators, vineyards, Caltrans, etc.] [NOTE: Since this is concentration, not mass-based, applying the TMDL to more sources should not be a big deal or require a division of the allocation according to equitable factors, etc.]. The allocations are expressed in terms diazinon concentrations, and are the same as the numeric targets and the TMDL. Progress towards or attainment of the allocation/target/TMDL will be demonstrated in receiving waters. Similarly, the strategy goals are expressed in terms of toxicity units that are the same as the goals themselves, and progress towards addressing the strategy goals will be evaluated in receiving waters as well.

Deleted: are

Deleted: of toxic units

Deleted: and

TMDL and Strategy Implementation

The cornerstone of the TMDL and the strategy is pollution prevention. Pesticide-related toxicity in San Francisco Bay Region urban creeks is to be eliminated for diazinon and prevented with respect to other pesticides by using pest management alternatives that protect water quality and not using pesticides that threaten water quality. Currently, it appears that this can best be accomplished through the rigorous application of integrated pest management techniques and the use of less toxic pest control methods. "Integrated pest management" refers to a process that meets the following conditions:

Deleted: this

Deleted: This

Deleted: least

- Pest control practices focus on long-term pest prevention through a combination of techniques, such as biological control, habitat manipulation, and modification of cultural practices;
- Pesticides are used only after monitoring indicates that they are needed;
- Treatments are made with the goal of removing only the target pest; and
- Pesticides are selected to minimize risks to human health, beneficial and non-target organisms, and the environment, including risks to aquatic habitats associated with pesticide discharges.

"Less toxic pest control" refers to the use of pesticides selected to minimize the potential for pesticide-related toxicity in water and sediment.

Deleted: Least

TMDL implementation will occur automatically as a function of the 2004 U.S. Environmental Protection Agency phase-out of urban diazinon applications. Since diazinon will no longer be available for purchase in urbanized areas, existing stocks will quickly be depleted within a reasonably short time and further use will be terminated. However, since other pesticides will likely be developed as substitutes for diazinon, strategy implementation will focus on three areas: (1) regulatory programs, (2) education and outreach, and (3) research and monitoring. Regulatory programs will prevent

Deleted: ¶
¶
S

pollution by using existing regulatory tools to ensure that pesticides are not applied in a manner that results in discharges that threaten urban creek uses. Education and outreach programs will focus on decreasing demand for pesticides that threaten water quality, while increasing awareness of alternatives that pose less risk to water quality. Research will fill existing information gaps, and monitoring will be used to measure implementation progress and success. The actions discussed below are intended to address these strategic objectives.

Deleted: proposed

Deleted: goals

Many entities share responsibility for potential pesticide-related toxicity, and many entities share potential responsibility for implementing actions to ensure that pesticide-related toxicity does not threaten water quality. Although the strategy goals apply to all urban storm drains, responsibility for attaining the strategy goals is not the sole responsibility of urban runoff management agencies, whose authority to regulate pesticide use is constrained. Actions to be implemented by regulatory agencies, urban runoff management agencies, and other entities are listed below. Many entities are already implementing these actions. The remaining actions will be phased in as soon as possible. Actions that can be required through NPDES permits are already in some permits and shall be incorporated into all applicable NPDES permits when the permits are reissued. In addition, other regulatory and non-regulatory actions will be used as voluntary actions should commence immediately, and inter-agency coordination is already underway.

Comment: Urban runoff programs strongly support the concept represented in this paragraph.

Deleted: allocation

Deleted: applies

Deleted: allocations

Deleted: Voluntary

Regulatory Agencies

The agencies with the broadest authorities to oversee pesticide use and pesticide discharges include the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and the Water Board. Regulatory and non-regulatory actions are needed to ensure that pesticide use does not result in discharges that cause or contribute to toxicity in urban creeks.

Water Board Actions

The role of the Water Board is to encourage, monitor, and enforce implementation actions, and to lead by example. The Water Board will implement the following actions related to regulatory programs:

- Track U.S. Environmental Protection Agency pesticide evaluation and registration activities as they relate to surface water quality and share monitoring and research data;
- When necessary, request that the U.S. Environmental Protection Agency coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the Clean Water Act;
- Encourage the U.S. Environmental Protection Agency to accommodate water quality concerns within its pesticide registration process;
- Work with the California Department of Pesticide Regulation and Structural Pest Control Board to ensure through the use of licensing and registration (e.g., pest control operators) as well as other (e.g., education) mechanisms, that pesticide

applications result in discharges that comply with the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act;

Deleted: and

- Interpret water quality standards for the California Department of Pesticide Regulation and assemble available information (such as monitoring data) to assist the California Department of Pesticide Regulation and County Agricultural Commissioners to take actions necessary to protect water quality;
- Work with County Agricultural Commissioners to use and/or adopt local pest control regulations, as necessary, to avoid toxicity in urban creeks; and
- Use permitting mechanisms (e.g., Industrial General Permit, Construction General Permit) to require implementation of best management practices and control measures to reduce pesticide-related toxicity in urban creeks.

Deleted: .

Formatted: Bullets and Numbering

The Water Board will implement the following actions related to outreach and education:

- Encourage integrated pest management and least toxic pest management practices;
- Encourage grant funding for activities likely to reduce pesticide discharges, promote least toxic pest management practices, or otherwise further the goals of this implementation plan; and
- Encourage pilot demonstration projects that show promise for reducing pesticide discharges throughout the Region.

The Water Board will implement the following actions related to research, monitoring, and overall program coordination:

- Promote and support studies to address critical data needs (see Adaptive Implementation, below); and
- Assist municipalities and others implementing the strategy by convening stakeholder forums to coordinate implementation.

U.S. Environmental Protection Agency Actions

The U.S. Environmental Protection Agency is responsible for implementing the Federal Insecticide, Fungicide, and Rodenticide Act and the Clean Water Act. The U.S. Environmental Protection Agency is therefore responsible for ensuring that both federal pesticide laws and water quality laws are implemented. The U.S. Environmental Protection Agency should exercise its authorities to ensure that foreseeable pesticide applications do not cause or contribute to water column or sediment toxicity in the Region's waters. Because some pesticides pose water quality risks, the U.S. Environmental Protection Agency should implement the following actions:

- Continue internal coordination efforts to ensure that pesticide applications comply with water quality standards and avoid water quality impairment (i.e., restrict uses or application practices to manage risks);
- Continue and enhance education and outreach programs to encourage integrated pest management and least toxic pest control; and

- Complete studies to address critical data needs (see Adaptive Implementation, below).

California Department of Pesticide Regulation Actions

The California Department of Pesticide Regulation regulates pesticide product sales and use within California pursuant to the California Food and Agricultural Code, which vests it with the authority to regulate pesticides to protect water quality. Specifically, the California Department of Pesticide Regulation is to prohibit or regulate environmentally harmful materials, which can include those with potential for environmental damage, including interference with attainment of water quality objectives. Confirmed and likely (based on available information) pesticide-related violations of water quality standards (i.e., water or sediment toxicity) meet the regulatory thresholds for California Department of Pesticide Regulation action specified in the California Food and Agricultural Code and Title 3 of the California Code of Regulations. Specifically, confirmed and likely pesticide-related violations of water quality standards may result in serious uncontrolled adverse effects on the environment. Pesticides used such that their runoff violates or poses a reasonable potential to violate water quality standards are environmentally harmful materials that require protective measures.

To be effective, this strategy relies on the California Department of Pesticide Regulation to use its authorities. Consistent with its authorities, the California Department of Pesticide Regulation should implement the following actions:

- Work with the Water Board to identify pesticides potentially applied in urban areas in a manner such that runoff could cause or contribute to violations of water quality standards;
- Use authorities to prevent potential pesticide-related surface water impairment before it occurs;
- Continue and enhance education and outreach programs to encourage integrated pest management and least toxic pest control; and
- Complete studies to address critical data needs (see Adaptive Implementation, below).

Collaboration within the California Environmental Protection Agency

As sister agencies within the California Environmental Protection Agency, the Water Board and the California Department of Pesticide Regulation should coordinate pesticide and water quality regulation in the Region. In 1997, the California Department of Pesticide Regulation and the State Water Resources Control Board entered into a management agency agreement. The California Department of Pesticide Regulation agreed to ensure that compliance with numeric and narrative water quality objectives is achieved. The State and Regional Water Boards retained responsibility for interpreting compliance with narrative water quality objectives. In light of the agreement, the Water Board and the California Department of Pesticide Regulation should work together to prevent runoff that exceeds water quality standards before water quality standards are exceeded.

The need to act should not depend solely on surface water monitoring data because such an approach would not prevent pollution before it occurs. In consultation with the California Department of Pesticide Regulation, the Water Board will implement the following actions:

- Review pesticide sales and use data to determine pesticides most commonly used in urban areas and most likely to run off and cause or contribute to violations of water quality criteria; and
- Select pesticides for further evaluation based on their chemical and physical properties, toxicological properties, and sites of use, and convey this information to the California Department of Pesticide Regulation.

In consultation with the Water Board, the California Department of Pesticide Regulation should implement the following actions:

- Initiate pest management assessments on common pests for which pesticides of concern identified by the Water Board are used;
- Use re-evaluation authorities to obtain necessary information concerning pesticides of concern identified by the Water Board, and if information gaps remain, make conservative (i.e., protective) assumptions to fill them;
- Estimate foreseeable water and sediment pesticide concentrations and compare them with water quality objectives, criteria, or provisional values (see Adaptive Implementation, below); and
- Use authorities to restrict pesticide applications sufficiently to ensure that foreseeable water and sediment concentrations are below water quality objectives and criteria (i.e., adopt regulations, direct registrants to mitigate potential water quality concerns, designate certain pesticides as restricted materials subject to permit conditions, or refuse or cancel registrations as necessary).

Formatted: Bullets and Numbering

Urban Runoff Management Agencies

NPDES permits for urban runoff management agencies shall require implementation of best management practices and control measures. These actions and those of the other entities included in this strategy will result in attainment of the allocations, targets, and strategy goals. Requirements in each NPDES permit issued or reissued and applicable for the term of the permit shall be based on an updated assessment of control measures intended to reduce pesticides in urban runoff to the maximum extent practicable and remain consistent with the section of this chapter titled "Surface Water Protection and Management—Point Source Control - Stormwater Discharges." Permit requirements shall focus on (1) support for pesticide regulatory actions that protect water quality, (2) adoption and implementation of integrated pest management and less toxic management practices within municipal operations and promotion of such practices within the local and regional communities, and (3) characterization and assessment of conditions within urban creeks receiving pesticide runoff.

Deleted: and

Deleted: least

The following general requirements shall be incorporated into NPDES permits issued or reissued for storm drain discharges:

1. Reduce reliance on pesticides that threaten water quality by adopting and implementing policies, procedures, or ordinances that minimize the use of pesticides that threaten water quality in municipal operations and on municipal property;
2. Track progress by periodically reviewing municipal pesticide use and pesticide use by hired contractors;
3. Train municipal employees to use integrated pest management techniques and require that they rigorously adhere to integrated pest management practices;
4. Require municipal contractors to practice integrated pest management;
5. Encourage (a) the use of appropriate landscaping at new development and redevelopment sites, (b) the minimization of impervious surface at these sites, and (c) the use of landscape designs that tend to delay runoff from entering nearby creeks; and
6. Study the effectiveness of control measures implemented, evaluate attainment of the targets and progress in addressing the strategy goals, identify effective actions to be taken in the future, and report conclusions to the Water Board.

Deleted: Require pest-resistant landscaping at new development and redevelopment sites, minimize impervious surfaces at these sites, and encourage landscape designs that tend to delay runoff entering nearby creeks

Deleted: all

The following education and outreach requirements shall be incorporated into NPDES permits issued or reissued for storm drain discharges:

1. Undertake targeted outreach programs to encourage communities to reduce their reliance on pesticides that threaten water quality. Educate municipal employees, local businesses (e.g., restaurants), structural and landscape pest control professionals, and the public at large. Focus efforts on audiences most likely to use pesticides that threaten water quality; and
2. Facilitate appropriate pesticide waste disposal, and conduct education and outreach to promote appropriate disposal.

Deleted: (whether or not they apply pesticides as part of their work responsibilities)

The following research and monitoring requirements shall be incorporated into NPDES permits:

1. Monitor diazinon and other pesticides as needed; monitor toxicity in both water and sediment; and implement alternative monitoring mechanisms, if appropriate, to indirectly evaluate water quality; and
2. Submit/disseminate monitoring data to appropriate regulatory agencies (e.g., the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation).
3.

Deleted: and toxicity in urban creeks,

Deleted: investigate

Deleted: and research

Deleted: with

Deleted: ;

Deleted: and

Deleted: Track U.S. Environmental Protection Agency pesticide evaluation and registration activities as they relate to surface water quality and, when necessary, request that the U.S. Environmental Protection Agency coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the Federal Clean Water Act; encourage the U.S. Environmental Protection Agency to accommodate water quality concerns within its pesticide registration process.

Formatted: Bullets and Numbering

The following requirements related to regulatory programs shall be incorporated into NPDES permits:

1. Participate/support efforts which encourage the U.S. Environmental Protection Agency to coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act with the Federal Clean Water Act, and to otherwise accommodate water quality concerns within its pesticide registration process.

2. Participate/support efforts (potentially including the submission of information such as monitoring data) which encourage the California Department of Pesticide Regulation to ensure that pesticide applications within the Region comply with both the Federal Clean Water Act and the Porter-Cologne Water Quality Control Act;
3. Report violations of pesticide regulations (e.g., illicit discharges, inappropriate handling) to County Agricultural Commissioners; and
4. Work with County Agricultural Commissioners to adopt local pest control regulations, as necessary, to prevent toxicity in urban creeks.

Formatted: Bullets and Numbering

Deleted: Assemble and submit information (such as monitoring data) as needed to assist the

Deleted: in

Deleted: ensuring

An urban runoff management agency that complies with these permit requirements shall be deemed to be in compliance with receiving water limitations relative to pesticides, including, but not limited to, diazinon, and pesticide-related toxicity. Once the Water Board accepts that a requirement has been completed by an urban runoff management agency, it need not be included in subsequent permits for that discharger. These requirements also apply to municipalities covered by the statewide municipal stormwater general permit (issued by the State Water Resources Control Board) five years after the effective date of this strategy.

Deleted: registered for use by the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation

Deleted: agency

Other Entities

Government Entities

County Agricultural Commissioners provide local enforcement of applicable pesticide laws and can adopt regulations that govern the conduct of pest control operations and the records and reports of those operations. County Agricultural Commissioners should implement and report to the Water Board on the following actions:

Deleted: the

- Continue and enhance enforcement related to overuse and misuse of pesticides, including pesticides sold over-the-counter;
- Continue to enforce the phase out of diazinon products and any new regulations affecting pesticide applications and their water quality risks;
- Work with urban runoff management agencies and the Water Board to adopt local pest control regulations, as necessary, to avoid toxicity in urban creeks; and
- Continue to coordinate with and contribute to education and outreach efforts undertaken by urban runoff management agencies and others.

The Structural Pest Control Board is responsible for licensing structural pest control professionals. The Structural Pest Control Board requires training and examinations to maintain a license to practice structural pest control, and regulates the advertising practices of structural pest control businesses. The Structural Pest Control Board should implement and report to the Water Board on the following actions:

- Work to develop a mechanism through which consumers can determine which structural pest control providers offer services most likely to protect water quality; and

- Work to enhance initial and continuing integrated pest management training for structural pest control licensees.

The University of California Statewide Integrated Pest Management Program promotes pest management education and outreach throughout California. The University of California should implement the following actions:

- Continue and enhance educational efforts targeting urban pesticide users to promote integrated pest management and least toxic pest management practices; and
- Continue to encourage and support efforts to identify and improve new less toxic pest management strategies for the urban environment.

[\[Insert needed regarding Caltrans\]](#)

Private Entities

Most pesticides do not occur naturally in the environment; they are manufactured. Pesticide manufacturers and formulators sell products to distributors and retailers, who sell them to the pesticide users who apply them. All these private entities should implement the following actions to prevent pesticide-related toxicity in urban creeks:

- Pesticide manufacturers and formulators should minimize potential pesticide discharges by developing and marketing products designed to avoid discharges that exceed water quality objectives. Many manufacturers successfully market such products. They should also undertake studies to address critical data needs (see Adaptive Implementation, below);
- Distributors and retailers should offer point-of-sale information on least toxic alternatives. They should also offer and promote least toxic alternatives to customers;
- Pest control advisors should recommend integrated pest management strategies so pesticides that could threaten water quality are used only as a last resort; and
- Pesticide users [including \[insert list of examples of the users being addressed, e.g., commercial pesticide applicators, landscapers, etc.\]](#) should adopt integrated pest management and least toxic pest control techniques so pesticide applications do not contribute to pesticide runoff and toxicity in urban creeks.

Monitoring

Monitoring is needed to demonstrate target attainment and to track and evaluate the effectiveness of the strategy. Diazinon monitoring needs to demonstrate that diazinon concentrations meet the target. When the concentrations consistently drop below the target, such monitoring [will](#) no longer be needed. However, because other pesticides will continue to be applied in urban areas, the need to monitor for water and sediment toxicity—and sometimes specific chemicals—will [likely](#) remain well after achieving the diazinon concentration target.

Deleted: may

A number of programs monitor pesticide concentrations and toxicity in the Region's waters, including the Water Board's Surface Water Ambient Monitoring Program, the

California Department of Pesticide Regulation's Surface Water Protection Program, and the Regional Monitoring Program. Municipal stormwater NPDES permits also often require dischargers to characterize their discharges and receiving waters. This can involve monitoring toxicity and specific pollutants, like diazinon, in storm drains and urban creeks.

Deleted: generally

Deleted: s

Pursuant to NPDES permits, urban runoff management agencies shall undertake and encourage/support monitoring efforts related to pesticides and toxicity. They shall be responsible for designing and implementing a monitoring program with a goal of answering the following monitoring questions:

Deleted: lead

Deleted: t

Deleted: o

Deleted: answer

- Is the diazinon concentration target being met?
- Are the toxicity strategy goals being addressed?
- If not, is urban runoff the source of diazinon or toxicity?
- If urban runoff is the source of toxicity, is the toxicity pesticide related? pesticide-related toxicity a problem in urban creeks (i.e., is the toxicity caused by a pesticide or something else)?
- If the toxicity target is not met because of a pesticide, how do the toxicity and the concentrations of the toxic pesticide vary in time and magnitude across urban watersheds?
- Are actions being taken to reduce pesticide discharges sufficiently improving creek conditions to meet targets and strategy goals?

Deleted: targets

Deleted: met

Formatted: Bullets and Numbering

The monitoring program may be developed by individual urban runoff management agencies, jointly by two or more local agencies acting in concert, or cooperatively through a regional approach (for example, SWAMP or the Regional Monitoring Program). Designing the program shall involve characterizing watersheds, selecting representative creeks, identifying sample locations, developing sampling plans, and selecting appropriate analytical tests of water and sediment. At a minimum, tests shall be used to measure the following:

Deleted: Chemical and toxicity tests shall be conducted on urban creek water and sediment.

- Water column toxicity;
- Sediment toxicity;
- Diazinon concentrations in water (until the diazinon concentration target is met consistently); and
- Chemical concentrations of other pesticides in water or sediment, as appropriate and feasible.

Sampling frequency, timing and number of samples shall be adequate to answer the monitoring questions above and any others set forth for the monitoring program.

Deleted: Sampling shall occur during at least two flow regimes: during storms that produce substantial runoff to urban creeks (ideally including the "first flush") and during the dry season. The

Additional types of monitoring tools may be used to support and optimize conventional water quality monitoring. For example, monitoring in storm drains or near application sites may be useful in selecting creek sampling strategies because pesticide concentrations are easier to detect nearer to the pesticide application site. Efforts to monitor parameters that can serve as surrogates or indicators of pesticide-related water

quality conditions may moderate the need for more comprehensive water quality monitoring. While some toxicity and pollutant monitoring will usually be necessary, extensive monitoring will be less important if other information is collected that indicates the potential for toxicity or specific pollutants to occur in water. Alternative monitoring information can also help focus water quality monitoring efforts and mitigation actions. Such monitoring could include reviewing pesticide sales and use data for the Region, pesticide fate and transport data, and public attitudes regarding pesticides and water quality. Such monitoring could seek to answer the following questions:

Deleted: always

- What pesticides pose the greatest water quality risks?
- How is the use of such pesticides changing?
- Are existing actions effective in reducing toxic pesticide discharges that threaten water quality?

ADAPTIVE IMPLEMENTATION

Adaptive implementation entails applying the scientific method to decision-making (i.e., taking immediate actions commensurate with available information, reviewing new information as it becomes available, and modifying actions as necessary based on the new information). Taking immediate action allows progress to occur while more and better information is collected and the effectiveness of current actions is evaluated.

Periodic Review

The Water Board will review this TMDL and strategy approximately every five years. The reviews will be coordinated through the Water Board's continuing planning program and will provide opportunities for stakeholder participation. If any modifications are needed, they will be incorporated into the Basin Plan. At a minimum, the following focusing questions will be used to conduct the reviews. Additional focusing questions will be developed in collaboration with stakeholders during each review.

1. Are urban creeks progressing toward the targets and goals as expected?
2. If it is unclear whether there is progress, how should monitoring efforts be modified to detect trends?
3. If there has not been adequate progress, how might the implementation actions or allocations be modified?
4. Is there new information that suggests the need to modify the targets, allocations, strategy goals, or implementation actions?
5. If so, how should the strategy be modified?

During the periodic reviews, the Water Board will consider newly available information regarding such topics as market trends, monitoring results, tools for risk evaluation, outreach effectiveness, and regulatory actions.

Although the implementation plan is intended to achieve the water quality standards, conceivably, after exhausting all practicable measures, discharges may not meet the allocations or fully address the strategy goals. After sufficient time has passed to develop and implement all practicable control measures and to assess their effects, a discharger

could prepare a thorough account of actions taken for Water Board consideration and provide an explicit rationale for why additional measures to control pesticide discharges would be either impracticable or ineffective. The discharger could also identify potential actions that others must take to meet the water quality standards.

New Sources

As the strategy is implemented, new sources of pesticide-related toxicity may emerge, either as the result of a new source being discovered or a new pesticide being applied. The Water Board will consider establishing a TMDL and allocation for a new source if necessary or otherwise refine the strategy. The Water Board may also consider establishing new targets and/or goals to address specific pesticides likely to cause or contribute to pesticide-related toxicity.

Critical Data Needs

Various types of information and tools are needed to adequately evaluate the risks associated with pesticide runoff. To the extent possible, the pesticide industry should shoulder the burden of collecting this information and developing appropriate tools. At times, however, the citizens of the Region (as represented by the Water Boards and the urban runoff management agencies) should lead by example. Therefore, the pesticide industry should undertake and regulatory agencies should support and promote the following actions:

- Develop publicly available and commercially viable analytical methods to detect ecologically relevant concentrations of pesticides that pose water quality risks;
- Develop Toxicity Identification Evaluation procedures that can be used to identify potential toxicity in water and sediment;
- Complete publicly available studies that characterize the fate and transport of pesticides applied in urban areas;
- Develop and adopt evaluation methods (e.g., quantitative fate and transport models) for urban pesticide applications, including applications to impervious surfaces; and
- Complete publicly available studies to support the development of water quality criteria for pesticides in water and sediment.

For most pesticides, numerical water quality criteria have not been developed. The Water Board will work with appropriate regulatory agencies to develop and implement guidance for developing provisional pesticide values that can be applied to receiving water bodies for the protection of aquatic life. Calculation of a provisional value does not eliminate the need to obtain data sufficient to develop water quality criteria.

Deleted: n

Deleted: In the absence of water quality criteria, a provisional value may be calculated as follows. Where valid tests have determined 96-hour LC_{50} values for aquatic organisms (the concentration that kills one half of the test organisms in 96 hours), a provisional value for the protection of aquatic life may be calculated by dividing the 96-hour LC_{50} for the most sensitive species tested by ten. Preferably, data should be available for the toxicity test organisms listed in Table 4-5 or at least one of the following three genera in the family Daphniidae—*Ceriodaphnia* sp., *Daphnia* sp., or *Simocephalus* sp. Other available information regarding the pesticide (such as but not limited to NOAECs and NOECs) may also be considered in light of the waters and the organisms involved to determine if lower concentrations are needed to ensure attainment of the narrative objectives. Calculation of a provisional value does not eliminate the need to obtain data sufficient to develop water quality criteria. ¶

¶ [NOTE TO REVIEWERS: The preceding paragraph (based on USEPA's *Technical Support Document for Water Quality-Based Toxics Control*) allows a NOEC/NOAEC to be estimated from a LC_{50} ; however, it does not ensure that the available LC_{50} is sufficiently sensitive that the resulting value is necessarily protective. The paragraph below is an alternative based on 40 CFR Part 132, Appendix A (applicable to the Great Lakes Region).]¶

¶ Where valid tests have determined 96-hour LC_{50} values for aquatic organisms (the concentration that kills one half of the test organisms in 96 hours), a provisional acute value for the protection of aquatic life may be calculated by dividing the lowest genus mean acute value (geometric mean of species mean acute values for a genus) by the factor in Table 4-x corresponding to the number of genus mean acute values available. A genus mean acute value should be available for at least one of the following three genera in the family Daphniidae—*Ceriodaphnia* sp., *Daphnia* sp., or *Simocephalus* sp. A provisional chronic value may be calculated by dividing the provisional acute value by 9.¶

¶

TABLE 4.x¶

Factors for Calculating Provisional Values¶

Number of Genus Mean Acute Values ... [1]

The following changes, shown in double underline/strikeout, apply to the section titled "CONTINUING PLANNING" in Chapter 4.

REGIONAL BOARD RESOURCE ALLOCATION

The items indicated below have been identified in this review as specific areas for which Water Board planning resources should be allocated. The items are divided into categories and each item is followed by an estimate of the frequency at which the item will be reviewed or the staff time and/or contract dollars needed to complete the item. Resolution of these items may result in future Basin Plan amendments.

TOTAL MAXIMUM DAILY LOAD	
<u>Review the Water Quality Attainment Strategy for Pesticide-Related Toxicity and TMDL for Diazinon in Urban Creeks, and evaluate new and relevant information from monitoring, special studies, and scientific literature. Determine if modifications to the targets, allocations, strategy goals or implementation plan are necessary.</u>	<u>Every 5 years</u>

Deleted: and Pesticide-Related Toxicity

In the absence of water quality criteria, a provisional value may be calculated as follows. Where valid tests have determined 96-hour LC₅₀ values for aquatic organisms (the concentration that kills one half of the test organisms in 96 hours), a provisional value for the protection of aquatic life may be calculated by dividing the 96-hour LC₅₀ for the most sensitive species tested by ten. Preferably, data should be available for the toxicity test organisms listed in Table 4-5 or at least one of the following three genera in the family Daphnidae—*Ceriodaphnia* sp., *Daphnia* sp., or *Simocephalus* sp. Other available information regarding the pesticide (such as but not limited to NOAECs and NOECs) may also be considered in light of the waters and the organisms involved to determine if lower concentrations are needed to ensure attainment of the narrative objectives. Calculation of a provisional value does not eliminate the need to obtain data sufficient to develop water quality criteria.

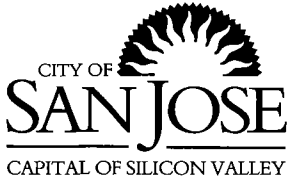
[NOTE TO REVIEWERS: The preceding paragraph (based on USEPA's *Technical Support Document for Water Quality-Based Toxics Control*) allows a NOEC/NOAEC to be estimated from a LC₅₀; however, it does not ensure that the available LC₅₀ is sufficiently sensitive that the resulting value is necessarily protective. The paragraph below is an alternative based on 40 CFR Part 132, Appendix A (applicable to the Great Lakes Region).]

*Where valid tests have determined 96-hour LC₅₀ values for aquatic organisms (the concentration that kills one half of the test organisms in 96 hours), a provisional acute value for the protection of aquatic life may be calculated by dividing the lowest genus mean acute value (geometric mean of species mean acute values for a genus) by the factor in Table 4-x corresponding to the number of genus mean acute values available. A genus mean acute value should be available for at least one of the following three genera in the family Daphnidae—*Ceriodaphnia* sp., *Daphnia* sp., or *Simocephalus* sp. A provisional chronic value may be calculated by dividing the provisional acute value by 9.*

TABLE 4.x

Factors for Calculating Provisional Values

<i>Number of Genus Mean Acute Values</i>	<i>Factor</i>
1	43.8
2	26.0
3	16.0
4	14.0
5	12.2
6	10.4
7	8.6



CITY OF SAN JOSE, CALIFORNIA
ENVIRONMENTAL SERVICES DEPARTMENT

Watershed Protection
3099 N. First Street • San José, California 95134
Telephone: (408) 945-3000/(408) 382-8800 • Fax: (408) 382-8888

September 19, 2005

Bill Johnson
San Francisco Bay Regional Water Quality Control Board
1515 Clay St., Suite 1400
Phone: (510) 622-2354
E-mail: bjj@rb2.swrcb.ca.gov

SUBJECT: Comments on the Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks Water Quality Attainment Strategy (WQAS) and Total Maximum Daily Load (TMDL) Proposed Basin Plan Amendment and Staff Report.

Dear Mr. Johnson:

The City of San José (City) appreciates the opportunity to submit comments on the August 2005 Proposed Basin Plan Amendment and Staff Report, *Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks Water Quality Attainment Strategy and Total Maximum Daily Load*.

The City recognizes the role of municipal storm sewer systems in addressing the issue of pesticides. The City has developed or contributed to a variety of activities over the past ten years aimed at characterizing and eliminating pesticide related toxicity in stormwater. The City of San Jose is clearly committed to reducing water quality impacts related to pesticides and, in particular, diazinon. The City's efforts include outreach to residents, businesses, and municipal staff to change pesticide use behaviors; monitoring studies; and participation in regional organizations aimed at characterizing and eliminating pesticide related toxicity in stormwater.

In order to have a defensible Total Maximum Daily Load (TMDL), the Regional Water Board should first identify the pesticides (if any, beyond diazinon) impairing beneficial uses in local creeks, and then identify the specific "upstream" controllable sources of those pollutants. Without such an analysis, it will be impossible to effectively regulate the sources of toxicity in urban creeks, much less determine how municipal stormwater dischargers can help reduce pesticide-related toxicity.

A scientifically sound, defensible TMDL is especially important in this case, given the complex regulatory framework governing pesticides. The report acknowledges this complexity by identifying the discrepancy that exists between regulations under the Clean Water Act versus those of the U.S. EPA Office of Pesticide Programs. The City does not regulate the use of pesticides. Therefore, attainability of any limitation of pesticides in urban runoff, where the same pesticides continue to be sold and used, is unrealistic.

The City would first like to reiterate some significant concerns made on behalf of the City, the Bay Area Stormwater Management Agencies Association (BASMAA), and/or the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) as public comment on the Final Project Report for Diazinon and Pesticide-Related Toxicity in San Francisco Bay Area Urban Creeks, dated March 2004.

- **Pesticide Registration** – U.S EPA Office of Water and Office of Pesticide Programs need to organize the pesticide registration process so that water quality criteria development is integrated into pesticide approval.
- **Separating the TMDL, the Implementation Plan, and the Water Quality Attainment Strategy (WQAS)**– combining the TMDL and the Implementation Plan will likely undermine the State’s authority and flexibility with regard to TMDL implementation. Furthermore, the WQAS and TMDL should be developed and adopted as separate policies. The TMDL, which is a federal requirement, should be specific to toxicity attributed to the pesticide diazinon. The WQAS is a broader policy governing toxicity attributed to pesticides in general.
- **Proposed/Future Allocations** – the Regional Water Board should not assume that future pesticide-related toxicity may result from sources and pathways similar to those of diazinon. The WQAS should include methods to identify new sources and procedures for assigning allocations to these sources.
- **Numeric Targets** – using toxicity targets in addition to the two diazinon concentration targets is inconsistent with guidance from the U.S. EPA (U.S. EPA 2000) which states “...targets should identify the specific instream goals or endpoints for the TMDL, which equate to attainment of the water quality standard” (i.e. the water quality objective for diazinon itself).

The following comments address the City’s specific policy and technical concerns with the August 2005 Proposed Basin Plan Amendment and Staff Report, with particular concern on the topic of monitoring benchmarks.

- **Page 8, Table 2.2 – Footnotes c & d Concerning Diazinon Concentrations < or > 100 ng/L.**

Comment: 100 ng/L is the draft EPA acute and chronic criteria for diazinon. This endpoint is twice as sensitive as the most sensitive species (*Gammarus fasciatus*) in EPA and/or CDFG databases and represents the theoretical 5th percentile most sensitive species. The acute sensitivity of *Ceriodaphnia dubia* is 377 ng/L (EPA) or 440 ng/L (CDFG). In the draft EPA diazinon criteria document (2000e), the Species Mean Acute Value of 377 ng/L was derived from 14 acute tests whose results ranged from 250 to 590 ng/L.

Recommendation: The Report should avoid inference or direct statement that the diazinon TMDL target of 100 ng/L and toxicity to *Ceriodaphnia dubia* are equivalent and

should report the correct, published sensitivity of *Ceriodaphnia dubia* (377 ng/L) to diazinon, along with the TMDL target of 100 ng/L in the Table 2.2 footnotes.

- **Page 11, Table 2.3 –**

Comment: The legends for range of means and medians are missing.

Recommendation: Include the legends for range of means and medians to Table 2.3. It may improve clarity to represent each of the means with a symbol and/or report the total number of sample means (n) for each sampling period.

- **Page 22, last paragraph –** “The California Department of Fish and Game has developed acute (one-hour exposure) water quality criteria for two pyrethroids, cypermethrin (2 ng/l) and permethrin (30 ng/l) (CDFG 2000a). These concentrations are lower than the equivalent diazinon criterion, 160 ng/l (CDFG 2000b; CDFG 2004).”

Comment: The references cite two different acute values.

Recommendation: Delete the reference to CDFG 2000b since it shows the acute value at 80 ng/L.

- **Page 22; last paragraph –** “These concentrations are comparable to the diazinon concentrations toxic to *Ceriodaphnia dubia* (SFBRWQCB 2003a).”

Comment: It is unclear which diazinon concentrations are toxic (causing 50% mortality) to *Ceriodaphnia dubia*.

Recommendation: Please add the range of diazinon EC50 values for *Ceriodaphnia dubia* in order to compare it to the range of values given for pyrethroids tested (70-700 ng/L). The draft EPA diazinon criteria document (2000e) reports diazinon EC50 values for *Ceriodaphnia dubia* ranging from 250 to 590 ng/L.

- **Page 62, Paragraph 3 –** The staff report discusses studies done by Moore and Waring (1996) and Scholz et al. (2000). Concerning the Scholz et al. study, the staff report concludes the following. “These adverse effects were not observed at 100 ng/L. Therefore, to provide an added measure of protection beyond the California Department of Fish and Game criteria of 160 ng/L, the proposed target reflects this no observed effects level:

The one-hour average concentration of diazinon in freshwater shall not exceed 100 ng/L.”

Comment: Both studies cited in the staff report were apparently designed to show effects at the parts-per-billion ($\mu\text{g/L}$) level and included a 100 ng/L exposure by design. However, no concentration was tested between 100 and 1000 ng/L. For both studies, the NOEC and LOEC values were 100 and 1000 ng/L, respectively. The chronic value (geometric mean of NOEC and LOEC) for these two tests (not reported in the studies) is 316 ng/L. The diazinon exposures were for two hours.

It is not appropriate to report a NOEC and compare it to a point estimate derived from acute tests. Comparing the chronic value or the effect of diazinon on alarm response, to the acute criterion makes the appropriate evaluation of sensitivity. In this case, the acute criterion of 160 ng/L is lower (more protective) than the chronic value of 316 ng/L. The CDFG chronic criterion of 100 ng/L is the most sensitive criterion overall.

Recommendation: Please change the “one-hour average” diazinon target to 160 ng/L or change the target of 100 ng/L to a 4-day average. The discussion of a “one-hour average” of 100 ng/L in the staff report is not sound and the reference to the study NOEC rather than the Chronic Value is misleading.

- **Page 62, Paragraph 3** – “Though generally protective, the U.S. Environmental Protection Agency’s guidance for developing water quality criteria does not necessarily account for all types of toxicity. Research concerning sublethal effects of diazinon on salmon indicates that short-term exposures to diazinon concentrations of 300 ng/L can reduce levels of reproductive steroids in some fish (e.g., salmon) (Moore and Waring 1996).

Comment: The U.S. EPA (2000e) draft diazinon criteria document lists Moore and Waring (1996) under unused studies that “exposed plasma, enzymes, excised or homogenized tissue, tissue extracts, or cell cultures.”

Recommendation: If U.S. EPA “does not necessarily account for all types of toxicity,” the staff report should explain why U.S. EPA deliberately did not use the referenced data (e.g. were there data quality or type of exposure concerns?).

- **Page 63, first full paragraph** – “The diazinon concentration target is intended to protect all species and is derived from toxicity data for many different species. Therefore, it is lower than the LC50 for *Ceriodaphnia dubia*.”

Comment: The statement should clarify the magnitude of the difference between the diazinon target and toxicity to *Ceriodaphnia dubia*. The diazinon target of 100 ng/L is also lower than the chronic NOEC for *Ceriodaphnia dubia* of 220 ng/L reported by U.S. EPA (2000e).

Recommendation: Please revise the sentence to indicate that the target of 100 ng/L is lower than the acute values for *Ceriodaphnia dubia* of 377 and 440 ng/L respectively, reported by U.S. EPA (2000e) and CDFG (2000b), and the chronic value of 339 (or NOEC of 220) ng/L reported by U.S. EPA (2000e).

- **Page 63, first full paragraph, last sentence** – “Water containing only diazinon (not a mixture of toxic substances) can exceed the diazinon concentration target without exceeding the toxicity targets.”

Comment: This is an appropriate qualifier (for other sections as well).

Recommendation: Place this qualifier into Table 2.2 or its footnotes.

- **Page 95 - 97, Monitoring Benchmarks**

Comment: The discussion of Safety Factors for calculating Monitoring Benchmarks that are “analogous to an acute criterion” does not address cases (e.g. permethrin) where sufficient data exist but where the State has not established Water Quality Standards. This includes cases where U.S. EPA or perhaps the California Department of Fish & Game has not promulgated criteria due to budgetary constraints or other reasons. If all eight data requirements (test endpoints for specific families of animals) are available, will Monitoring Benchmarks be determined using the EPA (1985) criteria development guidelines (regression approach)?

Recommendation: Discuss the approach that will be used to determine Monitoring Benchmarks for pesticides for which sufficient EPA data requirements (test endpoints) exist but have not yet been officially established or promulgated as standards or criteria. Please discuss the approach that will be used to determine Monitoring Benchmarks for pesticides for which all 8 data requirements may become available in the future. For example, if a given pesticide has 7 data requirements available, a FAV is calculated using a Safety Factor of 4.3. If the 8th data requirement becomes available, will the EPA regression approach be used to determine the FAV and hence the Monitoring Benchmark by dividing the FAV by 2? Or, will the Monitoring Benchmark continue to be based on the Safety factor of 4.3 until such time as EPA or CDFG criteria are promulgated or state Water Quality Standards are established (which could involve a very long delay)?

Additional Comment: The approach used to determine Benchmark Factors does not prioritize EPA data requirements. Rather, it assumes that all eight data requirements are equal. This is not true for pesticides in general or insecticides in particular. Thus, for cases where most data requirements for sensitive families of organisms are met, but requirements for insensitive families are not (e.g. a non-salmonid bony fish or a mollusk), the Benchmark Factors may be unnecessarily conservative. For example, the CDFG calculated an interim freshwater FAV for cypermethrin (CDFG 2000a) using only 7 of

the 8 data requirements. "...as the remaining freshwater taxon will likely be either a rotifer or a snail, neither of which tend to be sensitive to insecticides [and]...it is unlikely to significantly change the FAV." The CDFG calculated an acute criterion (CMC) of 2 ng/L for Cypermethrin. Using the lowest GMAV in the CDFG (2000a) database of 5.3 ng/L for *Hyalella azteca*, and a Benchmark Factor of 8 (for 7 data requirements), a Monitoring Benchmark is calculated as 0.66 ng/L. This is three times lower than necessary to protect aquatic life using CDFG reasoning.

Recommendation: Consider a ranking system or alternative way to determine an appropriate Monitoring Benchmark in cases where the most important data requirements are available. Safety Factors were originally designed to be applied to all toxic pollutants. Monitoring Benchmarks are being applied only to pesticides.

- **Page 113, 114 and Table 14.1** – Discussion on the costs incurred by EPA to develop Water Quality Criteria (WQC) for a single pollutant (e.g. pesticide).

Comment: An estimated budget of 1 PY or \$150,000 for the EPA to develop WQC for a single pollutant (e.g. pesticide) may be very low. Earlier the Staff Report stated (p.95) that "available data are rarely sufficient" to develop water quality criteria. Budget may be just as important a constraint as data availability. The City obtained an estimate on 9/6/05 from Mary Reiley of EPA (through Charles Delos) for developing "relatively uncomplicated, non-controversial criteria" of \$485,000 - \$585,000. This is broken down into EPA staff time (\$285,000) and contract work (\$200,000), with potentially an additional \$100,000 needed to generate additional toxicity data. Also, for more complex or controversial criteria, it is believed that this cost could double.

Recommendation: Revise the estimated EPA budget for development of water quality criteria. Please discuss what approach will be used if sufficient data appears to be available but neither EPA nor CDFG have reviewed the data for quality or calculated a criterion due to budgetary or other constraints. If sufficient data are available but no WQC have been developed, the Regional Water Board should review the data for quality and calculate a Monitoring Benchmark using the EPA regression approach. The regression approach should be discussed as a preferred option since, by definition, Monitoring Benchmarks may be overly conservative ("at or below the water quality criteria that would likely be calculated if sufficient data were available"). To the extent that Monitoring Benchmarks are overly stringent and not reflective of actual toxicity, the true cause of creek toxicity may be misidentified or conclusions regarding chemical specific results and toxicity results may be misinterpreted.

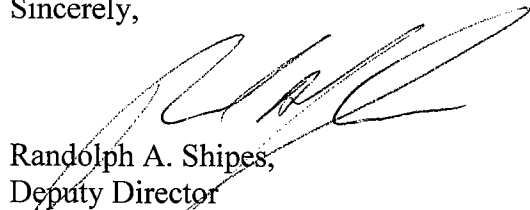
- **Page A-14** – "In the absence of water quality criteria, a monitoring benchmark may be calculated as follows."

Comment: It is not the absence of water quality criteria that should drive the use of the Benchmark Factors but whether the "Number of Data Requirements Satisfied" is less than eight. If all of the 8 required toxicity test results are available, but neither EPA nor CDFG has promulgated water quality criteria, the EPA regression approach should be used to determine a Monitoring Benchmark until such time as water quality criteria are developed and promulgated.

Recommendation: Replace the sentence in the BPA quoted above with the following. "In the absence of the eight data requirements needed to develop water quality criteria^a, a monitoring benchmark may be calculated as follows." Prior to the sentence beginning "Other available information...", add the following sentence. "If the eight data requirements are available for a pesticide (or become available in the future) and a water quality criterion does not exist for that pesticide, the EPA regression approach shall be used to calculate a Final Acute Value (FAV) and a Monitoring Benchmark (FAV/2), until such time as officially promulgated water quality criteria become available"

The City of San Jose incorporates by attachment earlier comments (dated April 12, 2004) submitted by the City of San Jose on the Final Project Report for Diazinon and Pesticide-Related Toxicity in San Francisco Bay Area Urban Creeks, dated March 2004. The City of San Jose also incorporates by reference comments submitted by the Bay Area Stormwater Management Agencies Association and the Santa Clara Valley Urban Runoff Pollution Prevention Program. Additionally, the City requests an additional 30 days to review the Water Board Staff Responses to Peer Review Comment as these were only received on September 13th and the City has not had sufficient time to review them. If you have any questions please contact Steven Osborn at (408) 382-8835.

Sincerely,



Randolph A. Shipen,
Deputy Director
Environmental Services Department
Watershed Protection

April 12, 2004

Bill Johnson
San Francisco Bay Regional Water Quality Control Board
1515 Clay St., Suite 1400
Phone: (510) 622-2354
E-mail: bjj@rb2.swrcb.ca.gov

SUBJECT: Comments on the final project report for Diazinon and Pesticide - Related Toxicity in Bay Area Urban Creeks Water Quality Attainment Strategy and Total Maximum Daily Load (TMDL).

Dear Mr. Johnson:

The City of San José (City) appreciates the opportunity to submit comments on the March 2004 final report, *Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks Water Quality Attainment Strategy and Total Maximum Daily Load*.

The City supports a cost-effective approach to controlling diazinon and other pesticide pollutants through applicable water quality regulatory mechanisms, including municipal stormwater permits, where necessary to protect beneficial uses. However, it is important that the San Francisco Bay Regional Water Quality Control Board (Water Board) recognizes that there is actually very little data on pesticide toxicity in local creeks and even less data on the contribution on pesticides in municipal stormwater runoff.

In order to have a defensible TMDL the Water Board must first identify the pesticides (if any, beyond diazinon) that are impairing beneficial uses in local creeks, and then identify the specific "upstream" sources of those pollutants. Without such an analysis, it will be impossible to effectively and efficiently regulate the sources of toxicity in urban creeks, much less analyze how municipal stormwater dischargers can help reduce pesticide - related toxicity.

A scientifically sound, defensible TMDL is especially important in this case, given the complex regulatory framework governing pesticides. The report acknowledges this problem by identifying the conflict that exists between regulation under the Clean Water Act versus through the U.S. EPA Office of Pesticide Programs.

In making these comments, we do not intend to imply that municipal storm sewer systems have no role to play in addressing the issue of pesticides. The City has developed or contributed to a variety of activities over the past ten years aimed at characterizing and eliminating pesticide related toxicity in stormwater. These efforts clearly demonstrate the City of San Jose's commitment to reducing water quality impacts related to pesticides and, in particular, diazinon, and include the following:

- significant outreach efforts to residents, businesses, and municipal staff to achieve behavior changes related to pesticide use;
- development and implementation of monitoring studies to characterize concentrations of priority pesticides (e.g., diazinon) and toxicity in urban runoff;
- and participation in regional organizations (e.g., Clean Estuary Partnership and Regional Monitoring Program) addressing pesticide-related issues.

The City has a number of specific policy and technical concerns with this Final Total Maximum Daily Load (TMDL) Project Report:

- The TMDL report places, even acknowledges placing, too large a proportion of the responsibility for diazinon and pesticide related toxicity on municipal storm sewer systems. Municipalities have very little jurisdiction to regulate private application of pesticides.
- This TMDL attempts to allocate loads for pollutants, "pesticide related toxicity," that are not identified in the 303d listing of impaired water bodies.
- The diazinon criterion of 80 ng/L (acute) and 50 ng/L (chronic) results in a target that is overly conservative and not based on the best available science. The California Department of Fish and Game (CDFG) did not follow the U.S. EPA approach. If they had used the U.S. EPA guidelines, they would have derived a number similar to the U.S. EPA criterion of 100 ng/L (acute and chronic).
- In various instances, further described below, this TMDL misquotes or misconstrues historical technical data related to diazinon and pesticide related toxicity.

In summary, this TMDL / WQAS report requires significant revision, and the City of San Jose strongly urges that this report be revised to address both policy and technical points listed above and described in detail below.

- **The proposed allocation scheme does not address upstream sources of diazinon.**

Comment: The Final Project Report (Report) identifies structural pest control operators, professional landscapers, and agriculture (along with residential consumer users of diazinon) as sources of diazinon discharges. The Report also lists the U.S. EPA and the California Environmental Protection Agency (including the SWRCB, RWQCB, and California Department of Pesticide Regulation) as agencies with significant implementation roles. However, the report fails to assign waste load or load allocations to most of the entities or agencies it identifies as sources but rather places all responsibility on urban runoff

management agencies (via waste load allocations). Allocation must be assigned to the actual sources of the toxicity, and implementation of the allocation assigned to agencies with jurisdiction over those sources, not to municipalities who have little or no control over the sources.

The Report recognizes that municipal stormwater programs do not have the authority to oversee pesticide applications. Accordingly the proposed allocation *"would pose a significant compliance liability for municipalities with stormwater permits, wherein the municipalities are accountable for the presence of the pesticides in their discharges but do not have the authority to regulate pesticide applications."*

Recommendation: The City requests allocating loads to identified sources such as structural pest control operators, professional landscapers, and agriculture, as well as businesses covered under the State Water Resources Control Board's (SWRCB) general permits for construction and/or industrial activities.

- **Separating the TMDL and the Water Quality Attainment Strategy (WQAS).**

Comment: In 1999, the State Water Resources Control Board designated 35 urban creeks in the San Francisco bay Area impaired by the organophosphate pesticide diazinon pursuant to Section 303(d) of the Federal Clean Water Act. More recently, the SWRCB increased the number of urban creeks impaired by diazinon to 37. These "303(d)" listings were specific to "Urban Creeks" and specific to impairment by diazinon. TMDLs must be consistent with pollutants identified by the State (See 40 C.F.R. 130.7(c)(1)).

The Water Board's Preliminary Project Report (dated September 2002) expanded the diazinon TMDL to include "pesticide - related toxicity". The City recognizes the Water Board has reconsidered this expansion and specified in the Final Project Report (Report) that the TMDL only includes diazinon, while the water quality attainment strategy (WQAS) includes pesticide - related toxicity. However, throughout the implementation section of the Final Project Report, it is unclear which actions are required under which policy (i.e., the TMDL or the WQAS). Further clarification is needed to determine what actions the City of San Jose's urban runoff management program will need to implement to demonstrate compliance with the TMDL, aside from the WQAS.

- **Proposed numeric toxicity targets for diazinon in Bay Area urban creeks go beyond the basis for the 303(d) listing.**

Comment: Developing a numeric target(s) is an integral part of the TMDL process. The Report proposes four numeric targets. Two diazinon concentration targets (acute and chronic) and two targets (acute and chronic) based on Toxicity Units (TUs). Numeric targets in the Report should be limited to the pollutant identified on the Clean Water Act 303(d) list as causing the impairment (i.e., diazinon). Using toxicity targets in addition to the two diazinon concentration targets is inconsistent with guidance from the United States Environmental Protection Agency (U.S. EPA 2000), which states "...targets

should identify the specific instream goals or endpoints for the TMDL, which equate to attainment of the water quality standard..."

The City is also concerned that new pesticides could become a problem in the future. However, pesticide-related toxicity (not including diazinon) in Bay Area urban creeks, has not been proposed as a listing via Section 303(d), and has not been subject to public comment or approved by the State and/or U.S. EPA. Current pesticide regulatory processes do not even require adequate evaluation of potential toxicity to aquatic life from stormwater runoff as a part of pesticide registration. More data is needed on pesticide-related toxicity before it can be considered. It is beyond the scope of the State's 303(d) listing to address this issue and, accordingly, the numeric criteria based on Toxicity Units should be removed from any proposed diazinon TMDL for urban creeks.

- Page 13: "Diazinon concentrations in Bay Area urban creeks varied seasonally, declining during the winter and increasing in the spring. Diazinon concentrations in urban runoff were greater when no substantial precipitation preceded a storm; therefore, diazinon levels were highest in urban runoff associated with the first winter storms."

Comment: This discussion needs graphical representations of the temporal trends discussed. The narrative description is difficult to follow and the use of winter, spring, summer and fall can be ambiguous since first storms can occur in fall or winter. The City suggests adding graphs to depict the important temporal trends. We also suggest consistently using specific months during which important trends were seen in the data.

- Page 34, 35: "Data were inadequate to develop other acute and chronic criteria for permethrin, cypermethrin, bifenthrin, and esfenvalerate in fresh or salt water." "The growing use of pyrethroids poses analytical challenges. Because pyrethroids are nearly insoluble in water, they bind strongly to any type of surface, including the surfaces of test containers and equipment (Laskowski 2002)." "In addition, no published procedures for conducting Toxicity Identification Evaluations for pyrethroids exist; therefore, identifying pyrethroids as the cause of possible toxicity could be difficult (Miller et al. 2002)."

Page 26: *"Given what is known about pesticide use trends, the pyrethroid alternatives may pose the greatest concern for water quality."*

Comment: The above statements throughout the text support the need for more information before pesticide-related toxicity can be appropriately addressed in a regulatory context.

- Page 61: "The U.S. EPA and CDFG independently developed water quality criteria following the U.S. EPA's guidelines. Each made distinct assumptions that resulted in different criteria. The U.S. EPA developed acute and chronic criteria of 100 ng/l (USEPA 2000e)".

Comment: The U.S. EPA criteria, is draft criteria, and should be stated as such.

*"The U.S. EPA and CDFG independently developed water quality criteria..." should include the word "freshwater" in an effort to assist non-technical readers to understand the discussion. For example, this sentence could be rewritten: "The U.S. EPA and CDFG independently developed **freshwater diazinon criteria concentrations** following the U.S. EPA's guidelines."*

- Page S-2: Targets for acute and chronic toxicity are set at 1.0 Toxic Units (TUs).

Page 58: "Therefore, the proposed numeric toxicity targets are as follows. There shall be no pesticide-related acute or chronic toxicity in urban creeks in excess of 1.0 TUa or 1.0 TUc."

Comment: 1 TU (acute or chronic) represents a regulatory "threshold" for toxicity impairment. However, samples with toxicity as low as 1 TU may not be sufficiently toxic in order to perform successful Toxicity Identification Evaluations (TIEs). For a chronically, barely toxic sample (e.g. 1.3 TUc) there may not be sufficient persistence of toxicity during holding time to even confirm the baseline toxicity, let alone perform a TIE. These shortcomings are addressed in the U.S. EPA TIE manuals and, should be discussed along with rationale for setting the regulatory limit at 1.0 Toxic Units. The City recommends a tiered approach similar to that being incorporated into current NPDES permits.

The report does not evaluate the role of non-pesticide pollutants in observed creek toxicity. In implementing and managing a pesticide-related toxicity TMDL or WQAS, we should not assume that pesticides cause all toxicity. The report provides poor linkage between the translated numeric objective of 50 ng/L for diazinon and observed toxicity to *C. dubia*. There should be a discussion of the TIE results, referred to in the report, so that this asserted linkage can be evaluated.

- Page S-2: "Proposed diazinon concentration targets are 50 nanograms per liter (four day average) and 80 nanograms per liter (one-hour average).

Comment: The TMDL report should discuss why it is implementing the TMDL without first promulgating a numerical Water Quality Standard (WQS) for diazinon. There is no promulgated, quantitative, Water Quality Standard for diazinon in the State.

The report should discuss the technical merits of using the CDFG criteria vs. the draft U.S. EPA criteria. The CDFG - CCC is 50 ng/L. U.S. EPA recently published a draft diazinon CCC for freshwater of 100 ng/l. That criterion and its derivation should be considered.

- Page 10: "As Table 2.1 indicates, the longer a *Ceriodaphnia dubia* organism is exposed to diazinon, the lower the concentration needed to kill it. The concentration lethal to 50% of *Ceriodaphnia dubia* within 4 days of exposure (the 96-hour LC₅₀) is about 340 ng/l (Bailey

et. al. 1997). The 7-day LC_{50} is roughly 100 ng/l (ACURCWP 1995a).” This latter endpoint (100 ng/l) is also reported in Table 2.1 as an “ LC_{50} ”.

Comment: The 100 ng/L result (ACURCWP 1995a) is not a true acute value for diazinon toxicity to *Ceriodaphnia dubia* because the test was not run in clean laboratory water. The ambient water used in the study may have contained any of hundreds of unmeasured pollutants. The results should not be reported in a Table which otherwise represents studies done in clean laboratory water. This 7-day acute value (100 ng/L) and the inverse relationship between exposure duration and LC_{50} are not substantiated by the example given and may even be altogether false. For example, the U.S. EPA conducted a 7-day chronic study on diazinon in which the Chronic Value (geometric mean of NOEC and LOEC) was reported as 338 ng/L (Norberg-King 1987). In that study, all animals survived in 220 ng/L (and lower) diazinon concentrations, and died in 520 ng/L concentrations. The chronic (geometric mean of NOEC & LOEC) and acute (LC_{50}) values were similar and U.S. EPA determined an acute-to-chronic ratio of just 1.112 for *C. dubia*. This means that the trend shown in Table 2.1 is dubious. The chronic result reported by Norberg-King (1987) was a more sensitive endpoint than an LC_{50} based on mortality and yet the result was more than three times higher than the LC_{50} reported by ACURCWP (1995) for ambient water. The Norberg-King results suggest that there is no difference between 4-day and 7-day mortality of *C. dubia* due to diazinon.

This example points out the difficulty of relating in-stream toxicity to chemical –specific results. To confirm the source of toxicity in a stream, the concentration of toxicant must be sufficient to produce the acute (or chronic) result. Other potential sources of toxicity should be investigated. Ambient waters should not be used to determine acute and chronic toxicity values for given toxicants since these waters may contain substances that either increase or ameliorate the effect of the toxicant under study.

- Page 10: “A similar study was conducted on water samples collected from Crandall Creek following a 1994 storm. Again, the Toxicity Identification Evaluation pointed to diazinon as the source of toxicity. The diazinon concentration in the sample was about 250 ng/l, a level slightly below the 96-hour LC_{50} of 300 ng/l estimated for *Ceriodaphnia dubia* during the same study (ACURCWP 1995).”

Page 15 - footnote h: “Diazinon concentrations may exceed 50 ng/l without causing *Ceriodaphnia dubia* toxicity (see Table 2.1).”

Comment: The U.S. EPA (2000) and CDFG (2000) reported *Ceriodaphnia dubia* Species Mean Acute Values (SMAV) of 377 and 440 ng/L respectively for diazinon. The authors should specify the percent of sample toxicity reduced by manipulations (e.g. additions of piperonyl butoxide) designed to lessen the effects of diazinon. Comparing 250 ng/l (the diazinon concentration in the sample) to 300 ng/l (the 96-hour LC_{50} estimated for *Ceriodaphnia dubia* during the same study) does not explain all of the toxicity in the sample. Unless the test resulting in an LC_{50} of 300 ng/l (ACURCWP 1995) was performed in clean laboratory water, the comparison is unwarranted. The

report refers to ACURCWP 1995 study data extensively, but it is not clear that ACURCWP 1995 study results support the author's statements in the TMDL report. The study design should be better explained so that the reader can correctly evaluate the report's assumptions, hypotheses, and conclusions. The authors should explain, in more than just a footnote, that the CDFG CCC of 50 ng/L for diazinon is not the effect level for *C. dubia*. The CDFG and U.S. EPA SMAVs for *C. dubia* are 7.5 to 8.8 times greater than the CDFG CCC of 50 ng/L for diazinon.

- Page 16 – Key Points: “Toxicity Identification Evaluations using *Ceriodaphnia dubia* concluded that diazinon caused the toxicity”

Comment: How much of the observed toxicity was due to diazinon? Was a Phase III TIE conducted to confirm the amount of observed toxicity attributed to diazinon?

- Page 37: "...some samples collected from urban areas, including some recent samples, have been lethal to *Ceriodaphnia dubia* (BASMAA 1996; SFBRWQCB 2004b).” "...diazinon concentrations in urban creeks throughout the Bay Area are often within the range of concentrations toxic to *Ceriodaphnia dubia*.”

Page 58: “Because creek water is sometimes toxic to *Ceriodaphnia dubia*, it exceeds the proposed toxicity targets.”

Comment: The author's linkage is poorly supported and they do not present TIE data to show the toxicity attributable to diazinon. This is a clear example of where the narrative WQS of “free of toxic substances” has not been appropriately and quantifiably translated to a numerical WQS for diazinon. The narrative toxicity WQS applicable to ambient waters does not have a direct relationship to any potential translated WQS for diazinon because the latter is derived from bioassays conducted in clean laboratory water that is free of other toxic substances. The issues of creek toxicity and diazinon impairment should be separated. The laboratory-derived toxicity of diazinon to *Ceriodaphnia dubia* (LC₅₀ of 377-440 ng/L) is 7.5-8.8 times greater than the proposed numerical target for diazinon (50 ng/L). The in-stream effects on that organism attributed by the authors to diazinon are likely due to the additive or synergistic effects of other contaminants in combination with diazinon.

- Page 58: “To achieve the targets, the toxicity in urban creeks must be eliminated.”

Page 59: “Other management strategies targeted at other toxic chemicals may be necessary if the toxicity were found to be unrelated to pesticides. Such strategies are beyond the scope of this report.”

Comment: If the creek toxicity is due to more than one pollutant all pollutants must be identified to propose successful management practices that will reduce or eliminate creek toxicity. It is impossible to quantifiably link creek toxicity to diazinon or other pesticides unless the contribution of all potential pollutants is determined. An appropriate screening

value for (creek) diazinon toxicity to *C. dubia* is 440 ng/L, the Species Mean Acute Value for that species (U.S. EPA 2000). The authors need to explain how they equate (quantifiably link) toxicity of diazinon and other pesticides to *C. dubia*. This will also quantify the amount of toxicity **not** related to pesticides so that “other management strategies... beyond the scope of this report” can be determined.

- Page 61: “The California Department of Fish and Game criteria are lower because the U.S. Environmental Agency considered an additional acute toxicity study and did not rely on a particular chronic toxicity study (CDFG 2001).”

Comment: This is a very misleading statement. The four-most-sensitive Genera used to derive the Final Acute Value (FAV) are identical in CDFG and U.S. EPA derivations. However, the Genus Mean Acute Values (GMAV) in the U.S. EPA derivation are either equal to or lower than the CDFG GMAVs is. The resultant CDFG FAV is lower than the U.S. EPA FAV because the U.S. EPA derivation includes 20 GMAVs while there are only 15 GMAVs in the CDFG derivation. Thus, besides the “additional acute toxicity study” (comprised of 7 acute tests using *Ceriodaphnia dubia*), the U.S. EPA also used data from **five genera** that were not used by CDFG.

Although the U.S. EPA FAV regression uses lower numbers than the CDFG, the derived FAV is higher since the regression is based on probabilities (i.e. total number of genera in the dataset). Although the CDFG derivation results in a lower FAV (and resultant acute criterion or Criterion Maximum Concentration), it is not more protective since it ignores data from five genera that U.S. EPA considers acceptable.

The chronic value (Criterion Continuous Concentration or CCC in U.S. EPA terminology) is the Maximum Acceptable Toxicant Concentration or MATC in CDFG terminology. Both are largely determined by the Acute-to-Chronic Ratio (ACR). The difference between the U.S. EPA CCC of 100 ng/L and the CDFG MATC of 50 ng/L is that the U.S. EPA ACR is 2 while the CDFG ACR is 3. The U.S. EPA approach is that sensitive species (*Ceriodaphnia dubia*, *Americamysis bahia*) have ACRs of less than 1. The CDFG includes a chronic study on *Daphnia magna* that was not used by the U.S. EPA. The CDFG used three ACRs to derive a final ACR. Also, CDFGs ACR for *Ceriodaphnia dubia* is higher (1.7 vs. 1.112) because CDFG did not use data from an U.S. EPA study (Norberg-King). The CDFG ACR for *Americamysis bahia* is also higher than the EPA version (2.5 vs. 1.586) because “USEPA used original data to recalculate values; CDFG (1994) used values calculated by authors” (CDFG 2000). The CDFG approach to the FAV and ACR is based on less data than that of U.S. EPA. The City reserves the right to make later comment on the appropriateness of CDFGs derivation of the acute and chronic diazinon criteria and on their use of the *Daphnia magna* data (Surprenant 1988).

- Page 61: “Moreover, recent research has found that diazinon concentrations as low as 100 ng/l can inhibit the ability of some fish (e.g. salmon) to smell. Therefore, diazinon exposure

at 100 ng/l could be detrimental to fish that rely on their sense of smell to avoid predation or to perform other critical behavioral functions (Scholz et al. 2000, Moore and Waring 1996).”

Comment: This statement is erroneous and misleading. The U.S. EPA draft diazinon criteria document (U.S. EPA 2000) lists Moore and Waring (1996) under unused studies that “exposed plasma, enzymes, excised or homogenized tissue, tissue extracts, or cell cultures.” Scholz et al (2000) is not cited in the EPA (2000) criteria document.

For clarification, City staff reviewed the two papers and concluded that the statement in the TMDL report is grossly incorrect. The significant concentration in both papers was 1000 ng/L not 100 ng/L. Excerpts from the abstracts to these papers are provided below.

Scholz et al. 2000: "Here we assess the effects of diazinon, an organophosphate insecticide, on alarm pheromone induced antipredator response and homing behavior in chinook salmon (*Oncorhynchus tshawytscha*). Nominal exposure concentrations (0.1, 1.0, and 10.0 $\mu\text{g}\cdot\text{L}^{-1}$) were chosen to emulate diazinon pulses in the natural environment. In the antipredator study, diazinon had no effect on swimming behavior or visually guided food capture. However, the pesticide significantly inhibited olfactory-mediated alarm responses at concentrations as low as 1.0 $\mu\text{g}\cdot\text{L}^{-1}$.”

Moore and Waring 1996: “Diazinon, an organophosphate pesticide, had a sublethal effect on the olfactory system of mature male Atlantic salmon parr. The olfactory responses of the parr to prostaglandin $\text{F}_{2\alpha}$ ($\text{PGF}_{2\alpha}$) were studied after exposure of the epithelium to different concentrations of Diazinon in water. Electrophysiological recordings from the epithelium indicated that the responses to this prostaglandin were significantly reduced at nominal concentrations as low as 1.0 $\mu\text{g}\cdot\text{L}^{-1}$.” (In addition, this study had poor recovery of spiked diazinon and reported diazinon results based on nominal concentrations in water even though measured values range from 13-42% of the nominal concentrations.)

Scientific expressions from both reports (1.0 $\mu\text{g}\cdot\text{L}^{-1}$ and 1.0 $\mu\text{g}\cdot\text{L}^{-1}$) equate to 1000 ng/L, or ten times the final chronic value (0.1 $\mu\text{g}/\text{L}$) recommended in the EPA (2000) draft criteria document for diazinon. Therefore, there is no need to reduce the EPA criteria to protect this salmonid olfactory endpoint.

- Page 61: “The California Department of Fish and Game criteria are also consistent with diazinon targets selected by other Water Boards.”

Comment: The Federal Register notice concerning the availability of the U.S. EPA draft - criterion for diazinon was issued on December 31, 2003. Prior to this draft, U.S. EPA had not derived nor recommended a freshwater final chronic value (CDFG 2000). Thus, “other Water Boards” would necessarily have relied on the CDFG final chronic value. It seems inappropriate to use an outdated criterion simply because it had been previously

selected by other Water Boards. The scientific merits of the new derivation should be considered rather than what another state agency did in the past.

- Page 72: “The proposed diazinon concentration targets are also conservative. They were selected, in part, because they are the lowest choice available. They are water quality criteria developed by the California Department of Fish and Game using U.S. Environmental Protection Agency’s guidelines intended to protect most aquatic organisms most of the time (USEPA 1985). The U.S. Environmental Protection Agency’s approach is sufficiently conservative that criteria developed using the U.S. Environmental Protection Agency guidelines may be adopted as water quality objectives.”

Comment: City staff agrees that the U.S. EPA criteria are conservative and that the CDFG diazinon criterion of 50 ng/L was the “lowest choice available.” However, the CDFG criterion of 50 ng/L is one-half of the U.S. EPA’s “conservative” final chronic value of 100 ng/L. That results in a target that is overly conservative and not based on the best available science. The CDFG did not follow the U.S. EPA approach. CDFG did not accept or reject the same data as did EPA. CDFG did not derive the same ACR as the U.S. EPA nor did they calculate a final chronic value in the same way as U.S. EPA. In short, if they had used the U.S. EPA guidelines, they would have derived a number similar to the U.S. EPA criterion of 100 ng/L. The City reserves the right to make further comment on this issue in the future.

- Page 87: “Because available information does not indicate that toxicity currently occurs in urban creeks due to pesticides other than diazinon, the toxicity targets are also expected to be met shortly after diazinon is phased out.”

Comment: The linkage presented in the report between the toxicity and diazinon targets (1 TU and 50 ng/L, respectively) is poorly supported. The report does not present data indicating that all creek toxicity will go away with diazinon. A toxicity strategy that includes only diazinon is not scientifically defensible. Toxicity and diazinon targets and strategies should be completely separated.

- **Final Comment:** A copy of the S. Siepmann and B. Finlayson report entitled, "Water quality criteria for diazinon and chlorpyrifos" Administrative report 00-3 California Department of Fish and Game should be made available in the appendix of the TMDL.

The City of San Jose incorporates by reference comments submitted by the Bay Area Stormwater Management Agencies Association and the Bay Area Clean Water Agencies. If you have any questions please contact Steven Osborn at 408-945-5303.

Sincerely,

Carl W. Mosher, Director
Environmental Services Department

Bill Johnson

Diazinon and Pesticide - Related Toxicity in Bay Area Urban Creeks WQAS and TMDL Final Project Report

April 12, 2004

Page 11 of 11

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENVIRONMENTAL ANALYSIS, MS 27
1120 N STREET
P. O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 653-7507
FAX (916) 653-7757
TTY (916) 653-4086



*Flex your power!
Be energy efficient!*

September 19, 2005

Mr. Bill Johnson
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
by e-mail: wjohnson@waterboards.ca.gov
fax: (510) 622-2460

Subject: San Francisco Urban Creeks Diazinon TMDL - Draft Basin Plan Amendment

Dear Mr. Johnson:

The California Department of Transportation (Department) strongly supports your effort to protect the environment and achieve the best possible water quality in the urban creeks. Regarding the subject Staff Report and Proposed Basin Plan Amendment, the Department appreciates the opportunity to provide comments. We are concerned with the waste load allocation assigned to the Department. The Department owns and maintains approximately 935 miles of roadway, 52 maintenance stations, 45 park and ride lots and two rest areas in the watershed. The total area of this right-of-way is approximately 27 square miles, which includes both paved roadway and unpaved vegetated areas. This total represents approximately 0.7% of the watershed. Diazinon has not been used within our right-of-way at any time. In our Statewide Monitoring Characterization Study¹, Diazinon was at non-detectable levels in storm water leaving the vast majority of the Department's facilities. The Staff Report states that the "storm drains convey essentially all pesticides found in the urban creeks." In addition, the Staff Report states, "The pesticide discharges result from normal use, random illicit activity or accidental spills" within the storm drain service area. Our system either conveys runoff from our roads and facilities, which are not sources, or it passes runoff from other dischargers. Given our small percentage of the watershed and the absence of Diazinon in our runoff, the Department should not be assigned a waste load allocation.

¹ Department of Transportation (Caltrans), 2003. *Discharge Characterization Study Report*. Report ID CTSW-RT-03-065. November 2003.

Mr. Bill Johnson
September 19, 2005
Page 2

We appreciate this opportunity to comment. If you have any questions please contact Ivan Karnezis at (916) 653-5417.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Flake". The signature is fluid and cursive, with the first name "Michael" and the last name "Flake" clearly distinguishable.

MICHAEL FLAKE, Chief
Office of Storm Water Policy

From: "Jerry Farris" <farrisjerry@hotmail.com>
To: <wjohnson@waterboards.ca.gov>
Date: 9/16/05 9:46AM
Subject: Response to Proposed Basin Plan Amendment

Bill,

Please refer to the attached response. These are my views and do not as of yet have the input of the PCOC General Pest Committee. I will be sharing your proposal and my response with them today.

I, regardless of how you take my response am on the side of IPM. But as outlined in the response this proposal is too vague and (in my opinion) is focused on the wrong cause of ground water pollution.

Most PCOs already practice IPM in some form. It's in their best interest to do so. It protects the environment. They can generate additional income by selling and providing the consumer the biological corrections. They use less pesticides therefore making more profit.

But in my experience most of the consumers support IPM until it comes time for them to either spend the money and/or labor for repairs and sanitation. At that point they only want the pest problem to go away. If PCOs are mandated to perform IPM services, the consumer will purchase over-the-counter pesticides and do the work themselves. They, for the most part do not read or follow the label and will not practice and IPM approach to applications.

This will only cause an escalation in ground water pollution.

Your efforts, time and monies should be focused on educating the consumer. Perhaps strong advertisement to be responsible with pesticides and hire a trained professional (PCO) to address their pest problems.

Don't hesitate to call me if you have questions or concerns regarding my comments or the attachment. 925-462-9900.

Thanks,

Jerry Farris

CC: <harvey@pcoc.org>, <kelli_okuma@dca.ca.gov>, <eric@pcoc.org>, <americanpest@nethere.com>, <gedwards@terminix.com>, <rme4north@aol.com>, <bryan@teamtoo.com>, <sghunter4@cox.net>, <jkurtzberg@charter.net>, <buglady@ix.netcom.com>, <ondaflly@msn.com>, <bugboss@pacbell.net>, <totalexterm2811@sbcglobal.net>, <rsub444@aol.com>, <angelo@rodentpesttech.com>

To: Bill Johnson
Copy: Kellie Okuma, Harvey Logan, Eric Paulsen and PCOC General Pest Committee
From: Jerry Farris
Date: September 16, 2005
Subject: Response to Proposed Basin Plan Amendment

--

First and foremost, I am both an advocate and practitioner of Integrated Pest Management. I believe in IPM, I train and require my employees to utilize IPM in all of their services. I preach IPM to my customers, showing them how to adapt IPM in their homes and businesses. IPM is our first approach to all pest issues, but due to consumer needs, requirements and demands not our only response.

With that said, I was both disappointed and concerned when I read the proposal submitted by Bill Johnson of the California Regional Water Quality Control Board.

Disappointed because both Eric Paulsen from Pest Control Operators of California and I have attended meetings with Mr. Johnson and his group providing them with industry input regarding their project. Eric's and my purpose was to develop an IPM protocol that would protect the environment and ground water and be workable for the industry and consumer. Little of what we recommended has been included in this proposal.

Concerned due to the numerous items that follow.

1. This proposal is extremely vague, leaving a great deal to be interpreted at a later date without a clear understanding as to what is being proposed.
 - a. Examples of the lack of specifics are in the body of my examples listed below.
2. Changes in the SPCB Regulations in regards to advertisement.
 - a. Due to the vagueness of the proposal this could create a slippery slope, opening the door for unsubstantiated or misleading claims as to what is "SAFE" and/or "PROTECTS THE ENVIRONMENT".
 - b. If you allow either your committee or a Pest Control Company or pesticide manufacturer to state or indicate through advertisement that the only "SAFE" pesticide application is made through the IPM process you will be greatly misleading the consumer.
 - c. IPM, as you mentioned in your proposal does not mean not using pesticides. You are correct, but need to further clarify.

The method of application has as great or greater affect on the environment as using pesticides as the last resort.

1. For example; we have addressed all of the biological needs on the property. Now we are going to use a pesticide. Which of the

following methods introduces the least environmental impact”?
Using a lesser toxic pesticide according to the label that calls for a band spray treatment (1 foot up on the structure and 1 foot out on the ground.

2. A more toxic and effective pesticide is applied using a crack and crevice technique (a pin spray application applied to the crack formed by the wall of the structure and the ground) instead of the label recommend band treatment.

In the first example the lesser toxic pesticide was applied as per its label. The second example applies the pesticide in a manner that uses less than the label recommended amount but places the pesticide where it does the most good according to the pest’s behavior.

A person/applicator can practice IPM and apply pesticides as per the label maximum requirement and still be applying pesticides in a method that could cause a greater impact on the environment than a person using a more toxic pesticide in a more effective manor than is listed on the label.

Consumer education is what’s needed, not implications that only IPM will protect the environment.

If you want to change the regulations regarding advertisement, please provide us with specific examples.

3. Changes in licensing requirements that mandate IPM training/certification.
 - a. Referencing page 46 of your proposal, Over-the-counter applications of Diazinon represents 50% of the total applications with Structural Pest Control at 27%. This does not indicate the percentage of ground water contamination caused by each group. I believe that due to the extensive training Structural Pest Control Operators receive, the contamination percents would be far less than 27% for them and much higher for the individual who purchases and applies the over-the counter products. The contamination percent would also be much higher for agricultural use due to the method of application. But, for sake of example I’ll use these above numbers in the following example;
 - i. This indicates that consumer education in regards to “reading the label” before application, and effects improper or over application has on the environment and water table.

Through years of selling and practicing IPM, I’ve come to the conclusion that unless you have 100% consumer buy-in in the program it will not work.

You can promote IPM and sell it to the homeowner and/or business owner. It sounds good to them; they are doing their part in protecting the environment.

But, when they become infested with ants the last thing they want to hear is that “they need to change and improve the biological conditions of their home or business”. They are getting pressure from their family and/or employees to get rid of the ants. They demand that you (the pest control operator) spray the ants away.

- ii. If, as you have mentioned in many of your committee meetings it becomes mandatory that all Pest Control Companies and applicators become IPM Certified, when the consumer demands that we rid them of the ants and we cannot because they have not corrected the biological issues, they (the consumer) will be forced to purchase and apply pesticides themselves. As per your example, the consumer is responsible by far for the water table and environment contamination with pesticides.
 - iii. Where will the Pest Control Operator, PCO acquire his IPM certification? Having been a participant of your committee meetings, I already know that you are working on becoming the source for IPM Certification in California. This would mandate that any PCO (company or individual) that currently or wishes to work in the industry must go to you and pay the fees set by you, if they are to work in the state.
 - iv. Currently, the Pest Control Industry funds the SPCB. As is stated in your proposal they are to become the administrator of IPM Certification and Continuing Education mandated requirements, where does the additional funding come from? Page 115 of your proposal states that the initial cost for the SPCB would be \$150,000 with no significant cost after the first or second year.
 - 1. I find this hard to believe. History shows us that cost estimates are more often that not under stated.
 - 2. PCO licensing and continuing education is and always will be an on-going process. How do you justify the “no significant cost” statement?
4. Changes in Continuing Education requiring mandatory IPM training/certification.
- a. Who will provide the “IPM Continuing Education”? Your board? And at what cost to the industry?
 - b. Where does the funds come from to allow the SPCB to review the education content and verify the PCO attendance?

5. Your proposal mentions on several pages your concerns as to the increased usage of pesticides such as pyrethroid, fipronil and others but does not address a viable substitute. Fipronil is the active ingredient in Termidor, a recent addition to our arsenal for ant control in California. It's new! Yes, there is an increased usage.

Please refer back to point 3. Education of the public should be the requirement, not mandated IPM certification. If mandatory IPM certification is imposed on the PCO, without first making the effort to educate the consumer as to proper pesticide applications, you will be ironically further damaging the ground water and environment because of consumer application of pesticides without the training and education and understanding as to responsible use of pesticides. I've heard numerous people (outside of the pest control industry) state that "if a little (pesticides) works a lot will work even better. This is the mind set that must be changed, not the mandatory and revenue generating (for someone) IPM Certification of the PCO.

I believe your efforts and moneys would be better spent, and get higher results if you focused on education of the general public as to how they are causing the ground water contamination. This could be accomplished without using the phrases "Safe" or "Environmentally Friendly". You could even help the environment and the PCO industry by promoting the general public to hire a Professional Pest Control Company.

The industry is very much aware of IPM most of us practice it. We talk it up to our customers and employees. IPM is good for the environment and the PCO. If we do it right we can charge the consumer for doing repair work, sanitation work and we use less chemicals, which improve both our revenue and profit. Why would we not want to provide IPM service?

It's the consumer that fails to or does not want to do their part in an IPM program.

Thank you,

Jerry Farris
Branch 2 Operator

From: "Pete Halpin" <pete_halpin@caltestlabs.com>
To: "Bill Johnson" <WJohnson@waterboards.ca.gov>
Date: 9/14/05 4:02PM
Subject: Urban Creeks diazinon TMDL comment

Hello Bill,
Thanks for your work on the TMDL. I appreciate the broad approach to addressing any pesticide related toxicity.

I am sending this email as public comment on the
Diazinon and Pesticide Related Toxicity in Bay Area Urban Creeks
Water Quality Attainment Strategy and TMDL
Proposed Basin Plan amendment and Staff Report

In the monitoring section, page 94 discussion of analytical tests there is the statement on the last bullet point related to other pesticides that pose a problem (including sediment quality threats) and the availability of commercially viable analytical methods for the suspected analytes of concern.

This may include pyrethroid pesticides as referenced elsewhere in the proposed amendment. Until very recently, there has not been a commercial laboratory capability with respect to the analyses of pyrethroid pesticides at low levels, as there was no commercial demand.

I want to make it known that Caltest has been working on pyrethroid analyses at levels that are environmentally relevant (with respect to toxicity) for two years now, and has been providing these analyses commercially to the public since October of 2004. I am attaching summaries of information regarding the analyses of pyrethroids that were submitted and distributed in an analytical laboratory workshop on the analyses of pyrethroid pesticides in sediment convened by the Central Valley Water Quality Control Board on August 31, 2005.

These attachments include a Word doc on method options; a Word doc on Analytical issues; and the NorCal SETAC (Northern California Regional Chapter Society of Environmental Toxicology and Chemistry) summer newsletter with two articles regarding the analysis of pyrethroids in environmental water and sediment samples.

The NorCal SETAC newsletter includes a table of reporting limits that are routinely achievable in real matrices (wastewater, sediment, soils). The reporting limits meet the currently understood need for sensitivity with regards to pyrethroids in sediment. In water the method reporting limits are very adequate for most pyrethroid analytes, but 3 ng/L higher than the goal for cypermethrin. We are working on lowering that reporting limit now.

I hope that this information is helpful. It is important to know what is available, and admittedly the commercial capability for the pyrethroid pesticide analyses is fairly new. We have purchased performance evaluation samples from a reputable vendor and have enquired into their capabilities to provide samples for investigation programs. They are willing and able, and with package pricing are able to get the price below \$150 per performance sample, which brings the quality control check sample capability of pyrethroid pesticide analyses into a very reasonable range.

In summary, with respect to pyrethroid pesticides in sediment and water the commercial capability currently exists. The detection limits are suitable for sediment and lower than target limits for 9 of 10 analytes in water. Quality control check sample capability exists. We would welcome technical review of the methodology employed. We are currently preparing to publish the version of analysis we use to make it more commonly available to others.

If you have any questions regarding the commercial analyses of pyrethroid pesticides in waters or sediments or soils please contact me at the laboratory.

Sincerely,
Peter Halpin
Caltest Analytical Laboratory
1885 North Kelly Rd
Napa CA, 94558

707-258-4000 Phone
707-226-1001 fax
Caltestlabs.com

August 30, 2005

Response from Caltest Analytical Laboratory
Irrigated Lands Conditional Waiver Program Sediment Pesticide Monitoring
Requirements Laboratory Workshop
August 31, 2005

ANALYTICAL APPROACHES

Current Limitations in Pyrethroid Analyses

Reporting Levels

Two pyrethroids of interest have a water quality goal below current method capabilities. They are Cypermethrin with a CVRWQCB Water Quality Goal of 0.002 ug/L, and Permethrin with goals of 0.03 ug/L in freshwater and 0.001 ug/L in saltwater. Caltest's current reporting level for cypermethrin is 0.005ug/L and 0.005 ug/L for permethrin. Reporting Limits are supported by calibration standards and MDLs. Reporting Limits should be at or below the goal, and preferably 10x lower than the goal.

Sediment reporting limits for pyrethroids should be sub ug/kg. These levels have been obtained by Lydys' group at Southern Illinois University and at Caltest in Napa California.

Hold Times

USGS and California Dept of Food and Agriculture hold time studies indicate hold times as short as 3 days to 13 days depending on the analyte. Such short hold times require coordination with the lab to extract the samples in time. Spiked sediment samples by Weston and Lydy have shown reproducible recoveries after several months frozen. California Dept. of Pesticide Regulation is looking at using methanol as a preservative at time of sampling to extend hold time in water.

Co-Reporting

Esfenvalerate and Fenvalerate are not distinguishable, and are reported by some including Caltest combined. Deltamethrin thermally degrades in the GC to Tralomethrin causing the two to be indistinguishable. They are reported together.

Approach to Existing Methods

Normalization of Results

USGS and some others normalize data to reflect extraction efficiency. Caltest follows EPA style (Clean Water Act and SW-846 manual methods) adding the internal standard at the instrument and not normalizing sample results according to extraction process recovery. Extraction surrogates are reported, but data is not normalized to that recovery.

Total Analyte Reporting

Caltest calibrates and quantitates samples based on the sum of the analyte's detectable isomers. Unless otherwise noted then, results are 'total'.

Extraction

Water samples can be analyzed with or without coarse sediments and solids. Some drinking water analyses for pyrethroids include SPE (solid phase extraction) with pre-filtering. This may suit the needs of drinking water raw water surveys but has been considered inappropriate for environmental analyses. Because pyrethroids have a strong affinity for solids, most water analyses for pyrethroids is based on 'whole water', that is water with all sediments/suspended solids included. Alternatively total 'whole water' and 'dissolved' fractions can be collected. When whole water samples are analyzed by liquid-liquid extraction, results will include pyrethroids bound to the solids as well as any dissolved fraction present. Pyrethroids are easily lost to surfaces they come in contact with. Sample bottles are solvent rinsed (with lids screwed on) to try to recover all analyte possible from the sample container walls.

APPROVED METHODS

Accreditations

There are no regulatory approved methods for these analytes. The draft EPA method suffers from lack of sensitivity relevant to the environmental levels of interest. Caltest's approach has been to run the GC/MS method exactly like all other EPA methods used for environmental compliance.

Instrument calibrations include more than 5 points. The Reporting Limit is supported by the low calibration standard and MDL. Second Source calibration check standards are employed. Batch QC matches EPA style of Method Blank, Laboratory Control Standard, Matrix Spike and Matrix Spike duplicate for each and every batch of samples, with a maximum batch size of 20 samples. Extraction surrogates are included, but results of surrogates are reported as is, results of extraction surrogates are not used to normalize the results. Internal standard is added to the sample at the instrument. Instrument tune is checked every 12 hours. Control limits are established based on lab in-house data.

Method Modifications

Caltest runs the GC/MS method per the USGS and California Dept. of Food and Agriculture methods. These vary from EPA promulgated methods in that instead of employing the method full scan, a short list of the most abundant ions per analyte are scanned in the selected ion monitoring mode. Running the Mass Spectrometer in this narrow range scan provides greater sensitivity. This sensitivity is required to get into the range of the environmentally relevant. By requiring the most abundant ions to be present, and observed in the correct ratio, a high degree of confidence of analyte identification is still maintained.

Further questions or comments may be directed to Peter Halpin at Caltest Analytical Laboratory, 1885 North Kelly Rd., Napa CA 94558 707-258-4000 or email to: pete_Halpin@caltestlabs.com

August 30, 2005

Some Pyrethroid Analyses Method Options

EPA Draft Method 1660, 1993

The Determination of Pyrethrins and Pyrethroids in Municipal and Industrial Wastewaters

HPLC with UV detector, using 2nd wavelength confirmation. Reporting Levels in the 2.5-5 ug/L range.

Extraction Hold Time 7 days, if not extracted within 72 hours adjust pH to 5.0-7.0

Dechlorinate if needed.

You, Weston, Lydy, Nov. 2003

A Sonication Extraction Method for the Analysis of Pyrethroid, Organophosphate, and Organochlorine Pesticides from Sediment by Gas Chromatography with Electron-Capture Detection

GC/ECD using second dissimilar column confirmation and extraction clean-up steps.

Reporting Levels in the tenths of a ug/kg range for sediment. Hold Time not stated, but frozen spiked samples have given consistent results after more than 4 months of storage.

USGS Water Resources Investigations Report 01-4098, 2001

Methods of Analysis by the U.S. Geological Survey National Water Quality Laboratory – Determination of Moderate-Use Pesticides and Selected Degradates in Water by C-18 Solid Phase Extraction and Gas Chromatography/Mass Spectrometry

GCMS narrow-range scan in Selected Ion Mode (selected-ion monitoring groups) Hold Times 3-15 days.

Solid Phase Extraction in this publication may not be suitable for run-off or stormwater.

California Dept. of Food and Agriculture

Center for Analytical Chemistry Environmental Monitoring Section

Determination of Pyrethroids in Sediment Water EMON-SM-52-7 2003

GCMS in Selected-Ion Mode. Hold Time 3-13 days

See the NorCal SETAC Summer 2005 newsletter for discussion articles on these and other approaches to the analyses of Pyrethroids in Environmental water and sediment samples.

Extraction options discussed in the literature include Waters by liquid-liquid extraction and solid phase extraction;

Soils by soxhlet, sonic horn and sonic bath.

Review/Summary by

Peter Halpin

Caltest Analytical Laboratory

Pete_Halpin@caltestlabs.com



NorCal SETAC News



Newsletter of the Northern California Regional Chapter of the Society of Environmental Toxicology and Chemistry.....Summer 2005

2005 Annual Meeting Review

NorCal SETAC held its annual technical meeting this year on May 3-4 at the University of California, Berkeley campus. Nicole David of the San Francisco Estuary Institute chaired the program and Josh Gravenmier hosted the meeting, which included four short courses, 33 platform presentations in 9 sessions, and 16 poster presentations. At the meeting the Chapter also was proud to announce Donald Crosby as its second Emeritus member. So many people come together to make the NorCal SETAC Meeting possible and our sincerest thanks go to everybody who helped make the 2005 Meeting another success.

Overall 150 people attended NorCal's 15th Annual Meeting and we have learned much from all the talks and posters, as well as from organizing another year of the conference. Session topics included Pacific Estuarine Ecosystem Indicator Research Findings, NPDES Testing: Recent Developments, Pyrethroids, Bioaccumulation Effects, Contaminant Monitoring and Modeling, Effects of Pest Control Measures, and Biomarkers and Effects. We would like to thank the session chairs Susan Anderson, Diane Griffin, Don Weston, David Ostrach, Karen Taberski, Ben Greenfield, and Jennifer Hayworth and the plenary speakers Bridgette DeShields, Edmund Smith, and Tracy Collier for their excellent contribution to the Meeting.

Many people offered us guidance and support including Don Weston and Steve Owen from the department of integrative biology at UC Berkeley and Rachel Butler from Conference Services. We are now not only looking ahead to planning the 2006 Annual Meeting but also to planning a dinner meeting in September and another bioassessment workshop in the fall, so please check your email and the NorCal SETAC newsletter for announcements and stay tuned.



Barbara Washburn and Katie Springman hard at work at the registration desk

More meeting photos on pages 6-7!



Mingling and breakfast treats before Platform Sessions.

Board Seeking Nominees for November Election

The NorCal SETAC Board of Directors is soliciting nominations for the 2006 Board. Directors are required to serve a three-year term, participate in one of the Board committees, and be a member of both NorCal and SETAC NA. The Board meets for a 1/2 day every other month. More information about the Board committees can be obtained at www.norcalsetac.org <<http://www.norcalsetac.org>> .

If you are interested or know someone who would be, please send nominations via e mail to Emilie Reyes at ereyes@waterboards.ca.gov.

IN THIS ISSUE...

14th Annual Meeting Lookback.....	1
Aquatic Biological Assessment Workshops.....	4
Current Topics in CA Bioassessment Dinner Meeting Announcement.....	5
May 3-4, 2005 Annual Meeting Moments.....	6-7
Diversified Perspectives.....	8-12
Analyses of Pyrethroid Pesticides at Low Levels by GC/MS.....	8-10
Advanced Techniques for the Analysis of Pyrethroid Pesticides.....	11-12
2006 Student Scholarship Program.....	10
Student Presenters at Annual Meeting.....	12
Don Crosby Named as 2nd Emeritus Member.....	13
Info...News...Facts.....	14-15
NorCal SETAC Membership Application	17

NorCal SETAC

835 Arnold Drive, Suite 104, Martinez, CA USA 94553
 (866) 251- 5169 x1108 (T) • (925) 313-8089 (F)
www.norcalsetac.org (web) • info@norcalsetac.org (e-mail)

Look for NEW Website Features

- Constitution and Bylaws
- Listing of Emeritus Members
- Current and Archived Newsletters
- Archived Annual Meeting Programs

NEWSLETTER PRODUCTION

Dan Glaze, Editor
 Glaze Regulatory Consulting
 37 Sandy Beach
 Vallejo, CA 94590
 707-328-4159
glaze37@comcast.net

Marsha Gilbert
 Graphic Designer
 Gilbert & Associates
 707-258-9966
marchez2@sbcglobal.net



Current NorCal SETAC Newsletter policy is to not solicit commentaries, but to consider printing commentaries as letters to the editor or as special sections when they are submitted and appropriate.

Website Features

As a member of NorCal SETAC you have exclusive access to many of the features offered on our website. Each member has a unique username and password that can be used to log on to the members only area of the website. Once logged on, members can search the directory for information about other NorCal members, modify their member record, and post job openings, resumes, and classified ads. If you don't have your username and password, you can enter your e-mail address on the website and it will be e-mailed to you or send an e-mail request to info@norcalsetac.org.

NEWSLETTER ADVERTISING RATES 2005

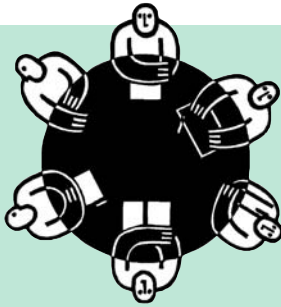
Size	Dimensions	Rate/ 1 issue	Rate/3 issues	Annual
Business card	2" x 3.5"	\$20	\$50	\$80
1/8 page	3.5" x 2.25"	\$25	\$63	\$100
1/4 page	3.5" x 4.75"	\$50	\$125	\$200
1/2 page	7.5" x 4.75"	\$100	\$250	\$400
1 page	7.5" x 10"	\$200	\$500	\$800

*Annual Package: 3 issues+ Annual Program+ Membership Directory

ADVERTISING

This newsletter is published three times per year and circulated to all members. This distribution is an excellent opportunity for your company to advertise its services or products to the appropriate audience.

Advertising Rates can be found in the table to the left. Please contact Dan Glaze, Chairman of the Media Committee for information.
glaze37@comcast.net



Year 2005 Representatives

Officers

Josh Gravenmier, President
Blasland, Bouck & Lee, Inc.

Nicole David, Vice President
San Francisco Estuary Institute

Stephanie Fong, Treasurer
CVRWQCB

David Crane, Secretary
CA Dept of Fish & Game

Directors

Bradley Sample
Immediate Past president
CH2M Hill

Dan Glaze
Glaze Regulatory Consulting

Emilie Reyes
SWRCB - DWQ

Inge Werner
UC Davis Dept of Vet Med: APCB

Kathrine Springman
UC Davis, John Muir Institute of the Environment

Barbara Washburn
OEHA

Jeanine Phillips, Student Director
UC Davis Dept of Vet Med: APCB

We would like to recognize and honor our 2005 Sustaining Members:

Aqua Science

Blasland, Bouck & Lee, Inc.

Block Environmental Services Inc.

Central Contra Costa
Sanitation District

City of San Jose ESD

Clorox Company

Weston Solutions

Pacific Ecorisk, Inc.

San Francisco Estuary Institute

Sierra Foothill Laboratory Inc.

Toxscan, Inc.

Valent USA Corporation



Trace Metals	Methyl and Total Mercury	Quality Data
Nutrients	Pyrethroid Pesticides	Customer Service
Organics		Courier Service

1885 NORTH KELLY ROAD • NAPA, CALIFORNIA • 94558
Caltestlabs.com • 707-258-4000 • 707-226-1001 fax
Excelling at Analyses of Waters at Low Levels

Aquatic Biological Assessment Workshops

The standardization of ecological assessments for use in California water quality management began with the development of the California Stream Bioassessment Procedure (CSBP) in 1993. Since then, the procedure has been calibrated with U.S. EPA procedures used throughout the west and has become the standard for the State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP).

The Northern California Chapter of the Society of Environmental Toxicology and Chemistry (NorCal SETAC) in collaboration with the Aquatic Toxicology Program at the School for Veterinary Medicine, UC Davis, is offering a set of workshops on conducting bioassessments in California. These workshops have been offered throughout California by Jim Harrington* using the instruction manual entitled "Measuring the Health of California Streams and Rivers" (Harrington & Born, 2000) and the latest bioassessment protocols approved by SWAMP.

Part 1 will be conducted on

September 7-9, 2005, at UC Davis

This workshop begins with one day of classroom presentations and discussion on Designing Rapid and Fully Integrated Freshwater Ecological Assessments. The next two days are conducted in the field with demonstrations of Physical/Habitat Assessments for Water Quality Projects and Sampling Biotic Communities in California Rivers and Streams. This workshop will provide the participant with an understanding of bioassessment design and prepare them for using the CSBP.

Part 2 will be conducted on

December 19-21, 2005 at UC Davis


This workshop will provide the participants with an understanding of the laboratory procedures used in bioassessment and how to use the information in water resource management. Using the samples collected in Part 1, each participant will work on teams to perform Family-Level Taxonomic Identification of Freshwater Invertebrates. Throughout the laboratory exercise, there will be examples on how to Insure Data Quality and then based on this "real data" set, each participant will Calculate and Interpret Biological Metrics. Finally, there will be presentations and a discussion of Current Topics on the Use of Freshwater Ecological Assessments in Water Quality Regulation.

These two workshop parts are designed to be independent of each other. However, it is recommended to take both parts in the same year and if possible, in sequence. There will be a separate SETAC certificate for each workshop. The cost for each 3 day workshop is \$300. The cost for both Part 1 and Part 2 is \$600.

**For registration and further information
please contact:**

**David Crane (dcrane@OSPR.DFG.CA.GOV) and/or
Inge Werner at iwerner@ucdavis.edu.**

** The instructor is a Staff Environmental Scientist for California Department of Fish and Game. He has been directing the development of bioassessment in California since 1993, is a member of several U.S. EPA workgroups on integrating biological assessment into water quality regulation and is a contributing author of the SETAC Pellston Workshop entitled "Ecological Assessment of our Aquatic Resources: Application, Implementation, and Interpretation" (ISBN 1-88-611-56-2).*




CONSULTANTS WITH FOCUS

BBL Sciences®

A Passion for Environmental Excellence

With offices nationwide, BBL Sciences provides a full range of life sciences consulting services. Our 50+ scientists are experts in toxicology, ecology, endocrinology, chemistry, modeling, and statistical analysis.



BBL®
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

For more information:
Brigette DeShields
1670 Corporate Circle, Ste. 200
Petaluma, CA 94954
Tel: (707) 776-0865
Fax: (707) 776-0850

www.bbl-inc.com



Northern California Regional Chapter Society of Environmental Toxicology and Chemistry

P.O. Box 5061 Fair Oaks, CA 95628
(866) 251-5169 x1108 • info@norcalsetac.org •
<http://www.norcalsetac.org>



Thursday, September 22nd Dinner Meeting “Current Topics in California Bioassessment”

Featured Guest Speaker

Peter Ode, Ph.D.
DFG Aquatic Bioassessment Laboratory

Northern California SETAC is pleased to be hosting a dinner meeting featuring guest speaker Dr. Peter Ode from the Department of Fish and Game's Aquatic Bioassessment Laboratory on Thursday, September 22 at 6:00 pm at Rio City Cafe in Sacramento. **Dr. Ode, a research biologist with the ABL, will present an overview of the application of freshwater bioassessment techniques in California and discuss recent developments in the field.**

Dr. Ode received a bachelor's degree from Allegheny College and a Ph.D. in Entomology from Cornell University. Since joining the Aquatic Bioassessment Laboratory in 1995, Dr. Ode has been involved in nearly all aspects of developing and promoting freshwater bioassessment methodologies for use in statewide water quality assessment. Because biological assemblages integrate the water quality and habitat stressors occurring in watersheds, bioassessments provide a direct measure of stream health. Recent advances in bioassessment research are rapidly expanding the potential uses for bioassessment techniques in a variety of aspects of water quality monitoring and reporting. Dr. Ode will discuss the current state of bioassessment science in California and describe topics of current and future research.

Where:	When:	How Much:
River City Cafe 1110 Front Street Sacramento, CA 95814 (916) 442-8226	Thursday, September 22, 2005 Registration: 5:45 to 6:00 p.m. Dinner: 6:00 to 7:00 p.m. Speaker: 7:00 to 8:00 p.m.	Cash Only – Pay at Registration Professional Members - \$23 Student Members - \$15 Non-members - \$28

Dinner choices include: a dinner salad AND a choice of pasta primavera (penne pasta with assorted fresh seasonal vegetables sautéed and tossed in a zesty tomato sauce), grilled chicken breast (boneless skinless chicken breast with grapes, walnuts, and a chardonnay cream sauce, served over parmesan polenta), or pork medallions (medallions of pork marinated in garlic, thyme, and olive oil, grilled and served with sundried cherry and port wine demi, parmesan polenta and mixed vegetables) PLUS cheesecake dessert AND a non-alcoholic beverage (coffee, tea, or soda). Alcoholic beverages can be purchased separately.

Space is limited, so make your reservations early!

RSVP by September 10, 2005. Please contact Stephanie Fong (916-464-4822; swfong@waterboards.ca.gov) to RSVP or if you have any questions. Cancellations after September 15th will incur a \$25 fee.

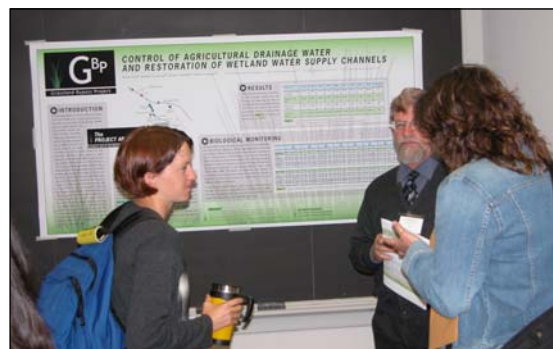
May 3-4, 2005...in pictures...



Emilie Reyes, Stephanie Fong, and Inge Werner working the registration desk.



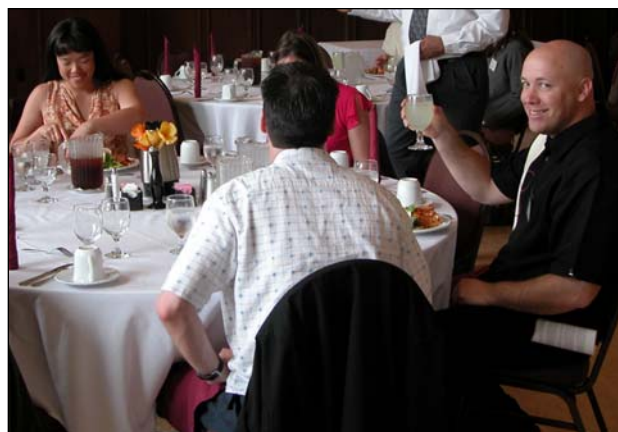
Tom Grovbourg presenting paper on SF Bay Area Cyanide criteria.



Discussion at one of the many posters.



Taking a break from the session.



Cheers Josh!



Enjoying lunch on the grounds at UCB's Clark Kerr Campus.



Ed and Bobbie Smith

...and more.



Bridgette DeShields and Ben Greenfield



Richard Looker on copper and nickel.



Josh Gravenmier, Dan Glaze and Bridgette DeShields discuss future activities.



Great food at the post-meeting cocktail hour.



Enjoying a break on the Plaza.



Plenary speaker, Dr. Tracy Collier



David Crane and Stephanie Fong



Inge Werner, Diane Griffin and Jeanine Phillips at the sustaining members luncheon.

DIVERSIFIED PERSPECTIVES

Analyses of Pyrethroid Pesticides at Low Levels by GC/MS

Peter W. Halpin, Caltest Analytical Laboratory, Napa CA (Pete_Halpin@Caltestlabs.com)

Richard Heines, Caltest Analytical Laboratory, Napa CA (Richard_Heines@Caltestlabs.com)

Pyrethroid pesticides are not new, but are being used more frequently as replacements for the organophosphorus pesticides Diazinon and Chlorpyrifos. Pyrethroids were expected to bring less inadvertent run-off toxicity than the pesticides they replaced, but newer evidence indicates that they cause toxicity in the sediment portion of the stream, and that dissolved levels may cause sub-lethal stresses to fish.

Pyrethroid Pesticides are also gaining more attention as recent toxicity studies indicate much lower thresholds of toxicity than indicated in existing Water Quality Goals. Generally speaking the analysis of Pyrethroid pesticides has been limited to reporting levels higher than the concentrations of interest for many analytes. More recently at least two non-commercial labs have provided reporting limits in the 0.01 to 0.05 ug/L range. Environmentally relevant reporting limits would ideally be in the single ng/L range, and 0.1 ng/L for permethrin and cypermethrin. Currently there are no regulatory approved methods.

The analytes of interest at this point seem to be represented by the following list:

Bifenthrin, Cyfluthrin, Cyhalothrin, Cypermethrin, Esfenvalerate/Fenvalerate, Fluvalinate, Fenpropathrin, Permethrin, Resmethrin, Tralomethrin/Deltamethrin.

Three existing analytical techniques are in use, and discussed in the literature. They are HPLC (High Pressure Liquid Chromatography) by EPA Draft Method 1660, GC/ECD (Gas Chromatography with Electron Capture Detector), and GC/MS-SIM (Gas Chromatography with Mass Spectrometer operated in the Single Ion Monitoring mode of narrow range scanning).

EPA's Draft Method 1660 lists reporting limits in the 2.5-5 ug/L range, with MDLs in the 1-2 ug/L range. This HPLC method is solely reliant on retention time for analyte identification. Confirmation is by retention time match on a dissimilar column.

Many existing Water Quality Goals are in the 50 to 180 ug/L range making the HPLC method appear to be an appropriate choice for some pyrethroid monitoring. However, the Water Quality Goals are 0.002ug/L for Cypermethrin and 0.03 ug/L in freshwater and 0.001 ug/L in saltwater for Permethrin. For Water Quality Goals at these levels the reporting limits provided in the HPLC method are 1000 to 5000x too high.

The most recent toxicology data indicates a need for reliable quantitation of pyrethroids in the low ng/L range in water, and sub ug/Kg for sediments.

Gas Chromatography with an Electron Capture Detector (GC/ECD) is the most commonly used method of analyses of pyrethroids because of the extreme sensitivity of the detector. Analyte identification is limited to retention time match and identification of multiple isomers for some analytes. Reporting limits for this method are 5-80 ng/L. This method has been used in government and university labs. GC/ECD confirmation of analyte identity is based on retention time match for the analyte on a dissimilar column. Where possible, results have been confirmed with mass spectrum analyses, but GCMS sensitivity has not been low enough to confirm at the same reporting levels as the ECD.

The GC/MS-SIM method used by Caltest is not single ion monitoring, but a narrow-range scan for three masses of each analyte. The analyte of concern is qualitatively identified by relative retention time and the ratio of the quantitation ion abundance to the qualifying ion abundance. The third ion is used for monitoring purposes, and only needs to be present. This is considered three-dimensional data while GC provides two-dimensional data. The three dimensional data provides more confidence in identification.

Reporting limits in water are 5-10 ng/L, and 0.33ug/Kg wet wt. in sediment. Known problems include the inability to separately identify or quantitate Esfenvalerate/Fenvalerate, and Deltamethrin/Tralomethrin. These compounds should be reported together as they are indistinguishable by the GC and GCMS methods.

Caltest's reporting levels are based on a 1-Liter sample with methylene chloride extraction concentrated to 1mL final volume in water, and 30g sediment extracted by cold-sonication using methylene chloride and acetone with a final volume extract at 2mL. Cold sonication is used due to the analytes being thermally unstable.

Caltest's Pyrethroid List of Analytes and Water Quality Goals

Pyrethroid Analyte	*CVRWQCB Water Quality Goal (lowest of all categories) ug/L	Caltest Aqueous RL ug/L	Caltest Sediment RL ug/Kg	Hold Time in Reagent Water per USGS	Storage Stability Study by CA Dept. of Food and Agriculture
Bifenthrin (Biphenthrin)	110	0.005	0.33	>28 days	Stable thru 13days. Degradation by 30 days. Between 13 days and 30 is undetermined
Cyfluthrin (Baythroid)	180	0.01	0.33	15 days	Stable thru 13days. Degradation by 30 days. Between 13 days and 30 is undetermined
Cyhalothrin	35	0.005	0.33	3 days	3 days
Cypermethrin	0.002	0.005	0.33	15 days	Stable thru 13days. Degradation by 30 days. Between 13 days and 30 is undetermined
Fenvalerate (Pydrin)	175	0.005	0.33		Stable thru 13days. Degradation by 30 days. Between 13 days and 30 is undetermined
Fluvalinate	70	0.005	0.33		
Fenpropathrin (Danitol)	180	0.01	0.33		
Permethrin	0.03freshwater 0.001saltwater	0.005	0.33		3 days
Resmethrin	210	0.01	0.33		
Tralomethrin	53	0.005	0.33		

Hold Times added from USGS Water-Resources Investigations Report 01-4098 published 2001;

Storage Stability Study by CA Dept. of Food and Ag. as part of "Determination of Pyrethroids in Sediment Water" document:EMON-SM-52-7 Dated 09/04/2003


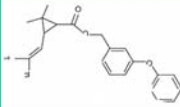
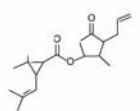
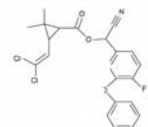
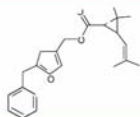
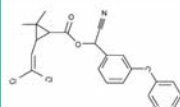
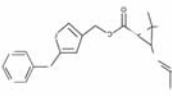
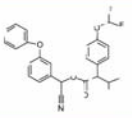
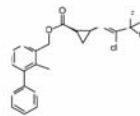
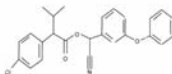
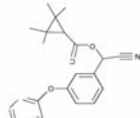
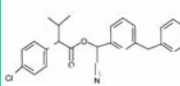
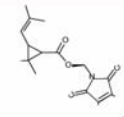
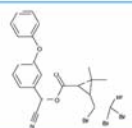
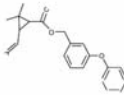
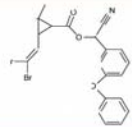
*State of California's Central Valley Regional Water Quality Control Board Reporting Limit (RL) by Caltest using GCMS SIM, November 2004

Caltest Analytical Laboratory
1885 North Kelly Rd, Napa CA, 94558 Tel 707-258-4000 Fax 707-226-1001
www.caltestlabs.com

The importance of the GC/MS-narrow range scan method is reporting limits low enough to be relevant to toxicity ranges demonstrated in recent studies, and the ability to identify the analyte with confidence even in complex matrixes. Because the mass spectral analyses provides an additional level of confidence in analyte identification, GC/MS is preferred over GC/ECD when the reporting limits by GC/MS are adequate. Additionally, it can be used as a filter to in effect 'remove' interferences and identify a peak that is partially obscured by interferences, which can't be done with conventional GC/ECD. Where the sensitivity of the mass spec meets data quality objectives, or at least meets the sensitivity of an alternative method, the mass spec is usually the better choice.

Pyrethroids are of interest in many matrixes, clean water, dirty run-off, industrial wastewater, and sediments. The robust mass-filtering capability of the mass spec makes it ideal to handle the demands of multiple matrix effects.

Co-author, Richard Heines developed the GCMS narrow range scan method referred to in this article.

PYRETHROID STRUCTURES			
Pyrethroid	Compound Structure	Pyrethroid	Compound Structure
1. Natural Pyrethrums		9. Permethrin	
2. Allenthin		10. Cyfluthrin	
3. Bioresmethrin		11. Cypermethrin	
4. Resmethrin		12. Flucythrinate	
5. Bifenthrin		13. Fenvalerate	
6. Fenprothrin		14. Esfenvalerate	
7. Tetramethrin		15. Tralomethrin	
8. Sumithrin		16. Deltamethrin	



NorCal SETAC Scholarship Program

The NorCal SETAC Graduate and Undergraduate Research Scholarship Awards are awarded to exceptional student members within our membership boundaries that are studying in the area of environmental toxicology and chemistry. Successful applicants must demonstrate their potential to carry out research projects related to the goals of NorCal SETAC.

NorCal SETAC will again be able to fund these scholarships in 2005 and the best proposals for this year will receive \$2,000 (graduate) or \$1,000 (undergraduate) for their research. The request for proposals will be announced soon on the NorCal SETAC website (www.norcalsetac.org). Completed applications will be due by August 31, 2005. The awardees will be notified by November 1, 2005 and awards will be dispensed within 30 days of notification. Awardees are expected to present their research at a NorCal SETAC meeting.

Advanced Techniques for the Analysis of Pyrethroid Pesticides

David B. Crane, Abdou Mekebri and Gloria Blondina, California Department of Fish and Game, Office of Spill Prevention and Response, Fish and Wildlife Water Pollution Control Laboratory, Rancho Cordova, CA (dcrane@ospr.dfg.ca.gov)

Gas chromatography (GC) with electron capture detection (ECD) has been the benchmark for the routine analysis of legacy pesticides and PCBs for many years. This instrumentation has also been used for the analysis of pyrethroid pesticides because the electron capture detector is extremely sensitive for these compounds resulting in very low instrument detection limits. Minimum detection limits (MDLs) for pyrethroids at the low parts per trillion (ppt) range for water samples and low parts per billion (ppb) range for sediment samples are routine. While the detector is not specific for these analytes, when used with two capillary columns with different stationary phases, useful data can be generated. Problems with this method of analysis include the potential for severe background (chemical) response for “dirty” samples such as surface water and sediments unless rigorous extract cleanup techniques are employed and the time consuming and tedious data analysis required to obtain accurate results from the two sets of retention time data acquired from the two different GC columns.

In the 1980s, affordable bench top gas chromatography-mass spectrometry (GC-MS) systems using electron impact ionization (EI) were introduced that allowed mass spectral confirmation of analytes from reproducible fragmentation patterns when samples were analyzed using “full scan” mode (mass range of approximately 50-600 atomic mass units). Full scan MS is an excellent technique for samples containing target analytes at high enough concentrations to be detected by this technique, which can be an order of magnitude less sensitive than GC-ECD. Selected ion monitoring (MS-SIM), where three ions are monitored, dramatically improves the instrument’s sensitivity for standards but most of the spectral information is lost. This loss of spectral information results in a loss of selectivity and can cause analyte identification and quantitation difficulties with “dirty” samples. Selected ion monitoring has been used for many years for the analysis of semi-volatile target compounds and if the sample extracts are clean (free of chemical interferences), the method can produce low-level, accurate and reproducible results.

The introduction of ion trap mass spectrometry technology resulted in improved instrument detection limits using full scan MS analysis without sacrificing the spectral information necessary for accurate analyte identification and quantitation. Ion trap GC-MS improved the instrument detection limits compared to conventional GC-MS but they are still not as low as GC-ECD instrumentation.

Gas chromatography and liquid chromatography interfaced with mass spectrometry are the methods of choice for environmental sample analysis. Advanced mass spectrometry techniques such as negative chemical ionization (NCI), MS/MS and MSⁿ that were once only available with very expensive research instrumentation are now available with moderately priced bench top GC-MS systems. These techniques have greatly improved instrument detection limits over conventional GC-MS analysis and MS/MS techniques have greatly improved analyte selectivity and lowered instrument detection limits by reducing the chemical interferences that are associated with “dirty” samples.

Negative chemical ionization, especially NCI-SIM can dramatically reduce detection limits for halogenated analytes even below the detection limits achievable using GC-ECD. NCI-SIM offers the best signal to noise results for standards of any of the above MS techniques. However, due to the lack of specificity, NCI suffers from the same potential chemical interference problems as GC-ECD. Extracts from “dirty” samples produce very noisy spectral results making analyte identification and accurate quantitation difficult or impossible.

Tandem mass spectrometry (MS/MS) using electron impact ionization is less sensitive than ion trap MS, MS-SIM, NCI-MS and NCI-SIM for clean standards. However, MS/MS provides the selectivity needed to produce clean and reproducible spectra providing spectral information used for positive identification and accurate quantitation of all of the analytes in a sample. By lowering or eliminating the chemical background present in

“dirty” samples, the signal to noise with MS/MS is increased making it one of the most sensitive MS techniques. NCI-MS/MS is even more sensitive than MS/MS for some halogenated analytes.

Chemists at the California Department of Fish and Game, Water Pollution Control Laboratory (WPCL) have successfully used dual column GC-ECD following extensive extract cleanup procedures for the analysis of pyrethroid pesticides. Using GC-ECD with dual 60 meter capillary columns (DB5 and DB17MS), we have separated the different pyrethroid pesticide isomers. Method detection limits as low as 2-10 ng/L for water samples and 1-3 ng/g (dry weight) for sediment samples have been achieved using this technique. We have also used ion trap MS/MS techniques to analyze and confirm the pyrethroid pesticides lambda cyhalothrin and bifenthrin in surface water and

sediment samples at very low concentrations achieving estimated MDLs of 0.2-0.5 ng/L for water samples and 0.2-0.5 ng/g for sediment samples.

We are currently developing MS/MS methods using a triple stage quadrupole (TSQ) GC-MS equipped with NCI. In the next few months we will be developing and evaluating both GC-MS/MS and NCI-MS/MS methods for the analysis of trace levels of pyrethroid pesticides in surface water, sediment and tissue (plant and fish) samples. Based on the results of our earlier work with the analysis of bifenthrin and lambda cyhalothrin using ion trap MS/MS techniques we anticipate that the TSQ instrument will produce accurate results for sub-ppt concentrations of pyrethroid pesticides in water and sub-ppb concentrations in sediment and tissue. We also plan to investigate the use of liquid chromatography-tandem mass spectrometry (LC-MS/MS) for the analysis of pyrethroid pesticides.

Student Presenters at Annual Meeting



Pictured above are some of the students who presented their work at the 2005 meeting. Close to 15 student presentations were made at the annual meeting on a variety of interesting topics, ranging from modeling of atmospheric PAHs, effects of pyrethroids on salmon, ecotoxicogenomics, to the analysis of imperviousness in landscape scale risk assessment. A total of six monetary awards were given to students who made either poster or platform presentations. The awards were based on the clarity, approach, originality, and style of presentation. This year, faculty were contacted at all regional institutions of higher education with an environmental science program in order to encourage more participation by students. We plan to broaden outreach to students and increase their participation at future meetings.

Don Crosby named as 2nd Emeritus Member



At the Annual Meeting the Chapter also named Dr. Donald Crosby to join Ed Smith as its second Emeritus member. Don had his first paper on pesticide chemistry published in the JACS at age 20 and earned his doctorate in 1954 from the California Institute of Technology, Pasadena.

In 1961 he began a distinguished career at University of California, Davis when he was asked to form its first toxicology department. A few years later (1967) he coined the name "Environmental Toxicology" for the department, the first such use as a department name anywhere. As a professor until 1991, he sponsored over 40 PhD and MS students and was awarded the title of Professor Emeritus in 1991.

Don had over 220 technical papers published, has authored 3 books and co-authored 3 others.

Importantly Don was also a founding member of both SETAC (NA) as well as our NorCal SETAC chapter.

BLOCK ENVIRONMENTAL SERVICES

BIOASSAYS & CONSULTING

- | | |
|---|---|
| <ul style="list-style-type: none">• Acute/Chronic• Percent Survival• LC50• TIEs/TREs• Sediment Toxicity• Freshwater/Estuarine/Marine | <ul style="list-style-type: none">• Human Health Risk• Ecological Risk• Hazardous Waste• Product Registration• GLPs• Permit Compliance |
|---|---|

Test Species for Sale

California EPA Certified/Rapid Turn Around Time

BES

(800) 682-7255 www.blockenviron.com

2451 Estand Way Pleasant Hill, California 94523

Info...News...Facts...

EPA Publishes the Methods Innovation Rule in the Federal Register as Final on June 14, 2005

The U.S. EPA published the Methods Innovation Rule (MIR) in the Federal Register as a Final Rule on Tuesday, June 14, 2005. Promulgation of the MIR removes the unnecessary requirements in the RCRA regulations to use only SW-846 methods. With the exception of about 25 method-defined parameters, which are still incorporated by reference in the RCRA regulations at 40 CFR 260.11, SW-846 methods are now guidance. View or download at <http://clu-in.org/techpubs.htm>

OEHHA adds two new chemicals to list of chemicals known in the state of CA to cause cancer or reproductive toxicity

The Office of Environmental Health Hazard Assessment (OEHHA) of the California Environmental Protection Agency is adding 2-bromopropane (2-BP) (CAS No. 75-26-3) and 1-hydroxyanthraquinone (CAS No. 129-43-1) to the list of chemicals known to the state to cause cancer or reproductive toxicity for purposes of the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health and Safety Code section 25249.5, Proposition 65). The listing of 1-hydroxyanthraquinone is effective May 27, 2005 and the listing of 2-bromopropane (2-BP) is effective May 31, 2005. http://www.oehha.ca.gov/prop65/prop65_list/2bp1hydroxynot.html

OEHHA Publishes Memorandum on the Re-Evaluation of the PHG for Inorganic Mercury

Under the Calderon-Sher California Safe Drinking Water Act of 1996, the Office of Environmental Health Hazard Assessment (OEHHA) develops public health goals (PHGs) for regulated chemicals in drinking water and reviews and updates the risk assessments every five years (Health and Safety Code Section 116365(e)(1)). This memorandum represents an update of the literature review and reevaluation of the existing PHG for inorganic mercury (OEHHA, 1999). OEHHA's re-evaluation supports the previous PHG derivation in 1999, and concludes that the PHG for inorganic mercury should remain at 1.2 ppb. <http://www.oehha.ca.gov/water/phg/hgmemo0505.html>

OEHHA Publishes Memorandum on the Re-Evaluation of the PHG for Lindane

Under the Calderon-Sher California Safe Drinking Water Act of 1996, the Office of Environmental Health Hazard Assessment (OEHHA) develops public health goals (PHGs) for regulated chemicals in drinking water and reviews and updates the risk assessments every five years (Health and Safety Code Section 116365(e)(1)). This memorandum represents an update of the literature review and reevaluation of the existing PHG for lindane (OEHHA, 1999). OEHHA's re-evaluation supports the previous PHG derivation in 1999 (0.2 ppb). <http://www.oehha.ca.gov/water/phg/lindaneupdate.html>

ITRC Publishes Technical Guideline on Mitigation Wetlands

Characterization, Design, Construction, and Monitoring of Mitigation Wetlands (WTLND-2). This report was published by the Interstate Technology and Regulatory Council (ITRC). To promote the long-term sustainability of mitigation wetlands, this guidance provides developers, consultants, regulators, and communities with example checklists for evaluating and documenting habitat health and measuring other performance criteria of mitigation wetlands. <http://www.itrcweb.org/Documents/WTLND-2.pdf>

USACE Publishes Report on Regional Wetland Hydrology Indicators

The U.S. Army Corps of Engineers (USACE) ERDC Westland Regulatory Assistance Program has published a "Survey of Potential Wetland Hydrology Regional Indicators" by Chris V. Noble, Daniel J. Martel, and James S. Wakeley. The report provides an expanded list of hydrology indicators that could be used by Corps District staff delineating wetlands. <http://lib-web.wes.army.mil/uhtbin/hyperion/TN-WRAP-05-1.pdf>

USEPA and USACE Publish Report on Long-Term Monitoring of Groundwater

Roadmap to Long-Term Monitoring Optimization (EPA 542-R-05-003). This document, produced by EPA and the U.S. Army Corps of Engineers (USACE), focuses on optimization of established long-term monitoring programs for groundwater. It discusses tools and techniques that concentrate on methods for optimizing the monitoring frequency and spatial distribution of wells.

View or download at <http://clu-in.org/techpubs.htm>

USEPA Announces Availability of MTBE Guidance for LUST Sites

Monitored Natural Attenuation of MTBE as a Risk Management Option at Leaking Underground Storage Tank Sites (EPA 600-R-04-179). This report reviews the current state of knowledge on the transport and fate of MTBE in groundwater, with emphasis on the natural processes that can be used to manage the risk associated with MTBE in groundwater or that contribute to natural attenuation of MTBE as a remedy.

<http://www.epa.gov/ada/download/reports/600R04179/600R04179.pdf>

USEPA Announces Availability of Environmental Research Brief on Arsenic Groundwater/Surface Water Interactions

The Impact of Ground-Water/Surface-Water Interactions on Contaminant Transport with Application to an Arsenic Contaminated Site (EPA 600-S-05-002). This document provides a brief overview of the dynamics of chemical processes that govern contaminant transport and speciation during water exchange across the ground-water/surface-water transition zone and presents results from a field study examining the fate of arsenic during groundwater discharge into a shallow lake at a contaminated site.

http://www.epa.gov/ada/download/briefs/epa_600_s05_002.pdf

NOAA Releases Second Volume of Manual on Coastal Habitat Restoration Monitoring

The National Oceanic and Atmospheric Administration (NOAA) released volume 2 of Science-Based Restoration Monitoring of Coastal Habitats, which is a two volume manual that provides technical assistance, outlines necessary steps, and provides useful tools for the development and implementation of sound scientific monitoring of coastal restoration efforts. Habitats covered in this Manual include: water column, oyster reefs, kelp and other macroalgae, rocky shore, rock bottom, soft bottom, soft shoreline, submerged aquatic vegetation (marine, brackish, and freshwater), coastal marshes (marine, brackish, and freshwater), mangroves, deepwater swamps, and riverine forests.

Volume One: A Framework for Monitoring Plans Under the Estuaries and Clean Waters Act of 2000 (Public Law 160-457)

Volume Two: Tools for Monitoring Coastal Habitats
http://coastalscience.noaa.gov/ecosystems/estuaries/restoration_monitoring.html

The Proven Leader in Sediment and Water Quality Assessment



Formerly MEC Analytical Systems

- ▶ Sediment Sampling & Testing
- ▶ Water Quality Monitoring Programs
- ▶ Ecological Risk Assessment
- ▶ NPDES/301(h) Permit Compliance
- ▶ Alternatives Analysis for Dredged Material Disposal
- ▶ Bioassay Testing
- ▶ Port & Harbor Environmental Compliance
- ▶ TIE/TRE
- ▶ Research & Development
- ▶ Watershed Management
- ▶ Data Management & Analysis
- ▶ Stormwater Monitoring

Contact: Scott Bodensteiner - Scott.Bodensteiner@westonsolutions.com

98 Main Street, Suite 428
Tiburon, CA 94920
(415) 435-1847

www.westonsolutions.com



PACIFIC ECORISK

Pacific EcoRisk is an environmental consulting firm conducting research and testing in the fields of environmental toxicology, aquatic biology, and environmental chemistry. Our scientists are skilled in integrating their expertise in these areas to produce high-quality, cost-effective, and often innovative solutions to complex environmental problems. Our primary objective is to provide the best information available for our clients, which include POTWs, industry and agriculture, ports/marinas, US military, local, state, and federal regulatory agencies, as well as support for environmental or engineering firms.

CONSULTING SERVICES

- Petroleum impacts on aquatic systems
- Pesticide impacts on aquatic systems
- Mining/Metals impacts on aquatic systems
- Areas of Special Biological Significance (ASBS) Monitoring & testing
- Site-specific Water Quality Criteria Studies
- Agricultural Runoff (Ag Waiver) Monitoring
- Support for Ecological Risk Assessments
- Support for TMDL Development
- Expert witness testimony

AQUATIC TESTING SERVICES

- NPDES compliance testing
- Effluents/Ambient Waters/Chemical Products
- Acute and chronic toxicity testing
- Freshwater, estuarine and marine tests
- Static, static-renewal and flow-through
- *In situ* monitoring & testing
- Title 22 hazardous waste testing
- Water Effects Ratio (WER) studies

SEDIMENT TESTING SERVICES

- Testing with freshwater, estuarine and marine species
- Bioaccumulation studies with freshwater, estuarine, and marine species
- Whole sediment, sediment elutriate, sediment porewater testing
- Sediment-Water Interface Core testing
- Static, static-renewal and flow-through
- *In situ* monitoring & testing

DREDGE MATERIALS EVALUATIONS

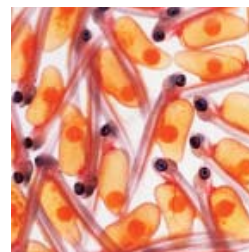
- Preparation of Sampling & Analysis Plans (SAPs)
- Client representation with regulators
- Chemical and biological evaluation of proposed dredge material
- Preparation of reports and facilitation of permits
- Tier I, Tier II, Tier III, and Tier IV evaluations

TOXICITY IDENTIFICATION/REDUCTION EVALUATIONS (TIEs, TREs)

- Phase I, Phase II, & Phase III
- Industrial and Municipal Effluents
- Ambient surface waters
- Stormwater runoff
- Whole sediment, sediment elutriate, and sediment porewater matrices
- Preparation of TRE workplans

FIELD SERVICES

- Ambient water quality monitoring
- Surface water and sediment collection
- "Clean technique" sampling
- Benthic invertebrate collection
- "Rapid" Bioassessment
- Pesticide application monitoring
- Physical/Habitat characterization



Formed in 1994, Pacific EcoRisk has rapidly established a reputation as being one of the best aquatic and sediment testing labs in the western United States. We are committed to performing only the highest quality work, and it is this philosophy that has led to our success.

For more information or to discuss your project or testing needs please call: (925) 313-8080 or visit: www.pacificecorisk.com

LOCATIONS

CORPORATE HEADQUARTERS
835 Arnold Drive, Ste. 104
Martinez, CA 94553
phone : 925.313.8080
fax : 925.313.8089

CENTRAL VALLEY
6820 Pacific Avenue, Ste. 3D
Stockton, CA 95207
phone : 209.952.1180
fax : 209.952.1180

SOUTHERN CALIFORNIA
2792 W. Looker Avenue, Ste. 100
Carlsbad, CA 92010
phone : 760.602.7919
fax : 760.602.9119



Northern California Regional Chapter

Society of Environmental Toxicology and Chemistry

835 Arnold Drive, Suite 104, Martinez, CA USA 94553
 (866) 251-5169 x 1108 • (925) 313-8089 (F) • info@norcalsetac.org
<http://www.norcalsetac.org>



APPLICATION FOR MEMBERSHIP

☐ Membership Renewal

☐ New Member

Please Print Neatly (Information will appear in Membership Directory)

Name	Telephone
Affiliation	Fax
Street	Cell Phone
City	Pager
State Zip	E-mail

CATEGORY OF EMPLOYER (Check one):

- | | | |
|--|--------------------------------------|---|
| <input type="checkbox"/> Government | <input type="checkbox"/> POTW | <input type="checkbox"/> Academia (Professional) |
| <input type="checkbox"/> Business/Industry | <input type="checkbox"/> Consultant | <input type="checkbox"/> Student (Grad./Undergrad.) |
| <input type="checkbox"/> Non-Profit Organization | <input type="checkbox"/> Other _____ | |

MEMBERSHIP APPLYING FOR (Check one):

- | | |
|---|---|
| <input type="checkbox"/> Regional (\$20/calendar year) | <input type="checkbox"/> Student (\$10/calendar year) |
| <input type="checkbox"/> Active, also a member of SETAC North America (\$20/ calendar year) | <input type="checkbox"/> Sustaining (\$225/calendar year) |
| <input type="checkbox"/> Emeritus (Board approved only) | |

PAYMENT TYPE (Check one):

- | | | |
|--|---------------------|-----------------|
| <input type="checkbox"/> Check/Money Order | | |
| <input type="checkbox"/> VISA | Credit Card # _____ | Exp. Date _____ |
| <input type="checkbox"/> MasterCard | | |
| <input type="checkbox"/> American Express | Signature _____ | Date _____ |

Mail this form along with payment made payable to: NorCal SETAC, 835 Arnold Drive, Suite 104, Martinez, CA USA 94553

NOTE: Please do not send cash or purchase requisitions. Your cancelled check will serve as your receipt