RESPONSES 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* (March 2004)**

December 16, 2004

San Francisco Bay Regional Water Quality Control Board (Water Board) staff released its *Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks, Water Quality Attainment Strategy and Total Maximum Daily Load (TMDL), Final Project Report* on March 8, 2004. We requested comments by April 12, 2004. Our responses to the comments we received appear below in chronological order. Each response is annotated with a reference to the original comment to facilitate side-by-side review of comments and responses. The responses for each commenter begin on the pages listed below:

G. Fred Lee
G. Fred Lee & Associates
March 23, 2004

Comment Letter Page 1
G. Fred Lee noted the importance of monitoring programs. As discussed in Section 11 (Monitoring and Adaptive Management), monitoring is a key component of our proposed Implementation Plan. The primary responsibility for monitoring Bay Area urban creeks lies with municipal urban runoff agencies. We expect that others will also contribute to monitoring efforts, including the Clean Estuary Partnership and the Water Board's Surface Water Ambient Monitoring Program.

Comment Letter Page 2
G. F. Lee stated that the Water Quality Attainment Strategy should be proactive and not simply focus on diazinon. He noted the potential for chemical interactions and sediment toxicity. We intend the proposed Water Quality Attainment Strategy to be proactive. Its purpose is to avoid future water quality impairment since we wish to avoid the need to take corrective actions after water quality impairment occurs. As discussed in Section 7 (Numeric Targets), the proposed toxicity targets address the potential for pesticide-related toxicity to be additive or synergistic because they account for chemical interactions within pollutant mixtures. Section 11 (Monitoring and Adaptive Management) includes sediment toxicity monitoring within the proposed monitoring program design.

Sejal Choksi
San Francisco Baykeeper/Waterkeepers Northern California
April 9, 2004

Comment Letter Page 2

Phaseouts are Ideal for all Toxic Pesticides

Sejal Choksi requested that we refer to the success of U.S. Environmental Protection Agency's diazinon phaseout throughout the report. We will review the report to see if adding references is appropriate, especially in Section 4 (Regulatory Oversight). Section 10 (Strategy and Proposed Actions) already refers to the phaseouts (see Table 10.4, Action EPA-1, and Table 10.5, Action CDPR-3). S. Choksi also requested that we explore ways to incorporate into the Implementation Plan actions anticipated under Stage 3 of the Management Agencies Agreement (mandatory requirements through Department of Pesticide Regulation authorities). We will do so.

Source Assessment

S. Choksi suggested that sources other than storm drains may be significant. Section 6 (Source Assessment) identifies storm drains as the most important source by far. We acknowledge that some other sources may also exist, but available evidence suggests that such sources are negligible. We could assign allocations for these *de minimus* sources, but not doing so is more conservative because the lack of an allocation is equivalent to an allocation of zero. If a source currently believed to be inconsequential were later found to be important, an allocation could be assigned in accordance with the adaptive management plan described in Section 11 (Monitoring and Adaptive Management). Adding an allocation through this process would require a Basin Plan Amendment.

Numeric Targets

S. Choksi questioned whether recently observed toxicity was related to diazinon. No one undertook Toxicity Identification Evaluations to determine the cause of the most recent (i.e., 2001 to 2003) toxicity found in Bay Area creeks. In some cases, the toxicity can be explained by the diazinon concentration detected in the samples; however, the causes of toxicity in the other samples are unknown. As a practical matter, a sample must typically be very toxic before a Toxicity Identification Evaluation can be completed. With or without the Water Quality Attainment Strategy, our intent is to require municipal urban runoff agencies to determine, to the extent feasible, the causes of any toxicity they find in urban creeks. A Basin Plan Amendment need not be adopted to accomplish this; we can, for example, require this under our existing permitting authority.

Comment Letter Page 3

Implementation Plan

S. Choksi supports proposed collaboration between the California Department of Pesticide Regulation and the Water Board, but asserted that proposed Water Board actions are too vague. We intend to work with the California Department of Pesticide Regulation to ensure that pesticides are not used in the Bay Area in a manner that results in toxicity in urban creeks. As for the perceived vagueness of the Water Board actions, we will try to be more specific or better illustrate what we intend when we draft the staff report for the proposed Basin Plan Amendment (currently in progress).

S. Choksi questioned how reference to hard surfaces and ant control relate to the actions listed in Tables 10.3 through 10.10. We refer to hard surfaces and ant control to provide some initial guidance to those working to reduce pesticide-related toxicity in urban creeks. However, this focus assumes that future pesticide risks will result from pesticide applications similar to those that result in diazinon risks. This is reasonable since the diazinon phaseout is fundamentally changing the

pesticide market in the near term and many replacement products are to be used in the same manner as the diazinon products being phased out. In the future, however, newer pesticides not associated with applications to hard surfaces or ant control could pose water quality risks. The Water Quality Attainment Strategy should be able to adapt to this possibility.

Timeline for Compliance Must be Included
S. Choksi noted that the implementation plan should include implementation time frames and enforcement plan. We intend to be specific regarding the implementation time frame in the proposed Basin Plan Amendment. Future actions, including permit issuance, must be consistent with the Basin Plan Amendment. We do not intend to specify in the Basin Plan Amendment specific enforcement actions for non-compliance with permit requirements. We will retain the Water Board's flexibility to select appropriate enforcement actions (e.g., time schedule orders, cease and desist orders, or cleanup and abatement orders) as it sees fit on a case-by-case basis.

Comment Letter Page 4
Monitoring and Adaptive Management
S. Choksi requested that we provide more detail about necessary monitoring. The monitoring provisions in the report are relatively detailed compared to other TMDLs. While we intend to be specific about the monitoring that needs to be undertaken, we also want monitoring plans to be flexible so they can be adaptively modified as new results become available. The Clean Estuary Partnership developed a plan to monitor diazinon and pesticide-related toxicity in Bay Area urban creeks over the coming years, and is supplementing monitoring that municipal urban runoff agencies are undertaking. We expect this effort to continue and evolve, thereby providing additional details about the monitoring that will occur.

CEQA Requires Precaution
S. Choksi advocates use of the precautionary principle. A TMDL is reactive in that it responds to existing water quality impairment after the problem already exists. However, the proposed Water Quality Attainment Strategy is designed to also be proactive and avoid future water quality impairment. We agree that sufficient information currently exists to support this approach. We will work with the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation to ensure that pesticides approved for use in the Bay Area will not threaten water quality. Moreover, we will work with the California Department of Pesticide Regulation to make the most effective use of our agencies' authorities. The California Environmental Quality Act does not explicitly call for a precautionary approach, but we will evaluate the potential adverse environmental impacts of adopting the proposed Basin Plan Amendment and possible alternatives before asking the Water Board to approve it.

Donald Freitas
Bay Area Stormwater Management Agencies Association
April 12, 2004

Comment Letter Page 1
Clearly separate the TMDL from the Water Quality Attainment Strategy
Donald Freitas interpreted our report to imply that the TMDL is for diazinon only, not pesticide-related toxicity, and asked that we separate the TMDL from the Water Quality Attainment Strategy for pesticide-related toxicity. On the contrary, the TMDL is not strictly for diazinon. The TMDL addresses pesticide-related water quality impairment attributed to diazinon in urban creeks. The distinction is subtle but important. The impairment occurs because the Basin Plan's toxicity objective is not met in urban creeks. Consistent with pollution prevention principles, we will not

propose to eliminate diazinon-related toxicity without considering the potential for our actions to result in new sources of toxicity. Therefore, the TMDL and the Water Quality Attainment Strategy are closely linked and cannot be separated.

Both types of numeric targets relate to the TMDL. The diazinon concentration targets relate directly to the diazinon problem, but by themselves, they may be insufficient to protect urban creeks from pesticide-related toxicity. They do not address potential interactions between diazinon and other chemicals that may contribute to toxicity, and the Basin Plan's toxicity objective is intended to address pollutant mixtures. The diazinon concentration targets also do not address the potential for the pesticides replacing diazinon to threaten water quality. For these reasons, we have proposed toxicity targets. Selecting multiple targets is consistent with National Research Council recommendations that biological criteria be used in conjunction with chemical and physical criteria to measure whether beneficial uses are achieved (National Research Council, *Assessing the TMDL Approach to Water Quality Management*, 2001). Because both types of numeric targets relate to the TMDL, allocations must be consistent with both types of targets, and the implementation plan must be directed toward achieving the resulting allocations.

D. Freitas objected to assuming that future pesticide-related toxicity may result from sources and pathways similar to those of diazinon. We do not assume that the sources and pathways of future pesticide-related toxicity will necessarily be the same as those of diazinon-related toxicity. However, because the foreseeable market changes in the near term relate to the diazinon phaseout, we reasonably assume that replacement pesticides will be used for purposes similar to those for which diazinon has been used. Because we cannot predict what pesticide applications might threaten water quality in the future, we propose a broad Water Quality Attainment Strategy to ensure that, in any case, water quality will be protected.

Comment Letter Page 2

Separate the Implementation Plan from the TMDL

D. Freitas asserted that an implementation plan is not required for a TMDL and requested that we separate the implementation plan from the TMDL. The federal Clean Water Act does not explicitly require that implementation plans be adopted with TMDLs, but whether implementation plans are implicitly required is a matter of debate. Federal law requires that TMDLs, upon U.S. Environmental Protection Agency approval, be incorporated within Basin Plans (if not pursuant to Clean Water Act §303[d] then pursuant to §303[e], the continuing planning process). On the other hand, California's Porter-Cologne Water Quality Control Act (§13242) unquestionably requires that Basin Plans include implementation plans that specify the actions needed to meet water quality standards, time schedules to complete the actions, and surveillance measures to determine compliance with standards. In California, TMDLs are not effective until these implementation plans are adopted. Neglecting to adopt a TMDL implementation plan thwarts the intent of the Clean Water Act to restore and maintain the integrity of the nation's waters. Without implementation, TDML development would be nothing more than a planning exercise that wastes public resources.

We have identified one major source of diazinon and pesticide-related toxicity in urban creeks—storm drains, which are point sources subject to National Pollutant Discharge Elimination System (NPDES) permits. For a water body receiving only point source discharges, a TMDL could be considered self-implementing because federal regulations require NPDES permits to be consistent with TMDL wasteload allocations. Without an implementation plan that describes the nature of the permit requirements, the most likely means of ensuring consistency is to place the allocations directly into permits as numeric effluent limitations. By developing a TMDL and its implementation plan together, however, we are retaining the Water Board's authority and

flexibility to describe how allocations are to be implemented. We are not ceding authority or discretion to anyone, including the U.S. Environmental Protection Agency, as D. Freitas suggested.

Regarding D. Freitas's reference to California's Porter-Cologne Water Quality Control Act (§13241 and §13242), the Water Board must consider several specific factors when establishing water quality objectives. However, we do not propose any new water quality objectives as part of the Water Quality Attainment Strategy; therefore, these requirements do not apply.

Comment Letter Page 3

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

D. Freitas asserted that we have not addressed all sources of pesticide-related toxicity. By far the most important source of pesticide-related toxicity in urban creeks is storm drains. We acknowledge that some other negligible sources may also exist. If we do not to assign allocations to these *de minimus* sources, their allocations will effectively be zero. We prefer not to assign allocations for what we consider inconsequential sources. Without more information demonstrating that these insignificant sources pose water quality risks, we do not intend for the Water Quality Attainment Strategy to include specific actions to address them. If a source without an allocation were later found to be important, an allocation could be assigned in accordance with the adaptive management plan described in Section 11 (Monitoring and Adaptive Management). Adding an allocation through this process would require a Basin Plan Amendment.

Attachment

Comment 1

D. Freitas asked that we distinguish between the scopes of the Water Quality Attainment Strategy and TMDL. As explained above, the scopes cannot be separated. We have proposed one comprehensive Water Quality Attainment Strategy that meets all the requirements necessary for the TMDL. In fact, as explained in Section 1 (Introduction), the Water Quality Attainment Strategy meets the requirements for a TMDL for the urban creeks formally listed as impaired pursuant Clean Water Act §303(d)(1) and a TMDL for all other Bay Area urban creeks (see Table 5.1) pursuant to Clean Water Act §303(d)(3). Regardless of the TMDL requirements, the Water Board's authority to adopt the Water Quality Attainment Strategy comes from Clean Water Act §303(e) and Porter-Cologne Water Quality Control Act §13240. The §303(d) list does not constrain the Water Board's authority to amend the Basin Plan as needed.

Comment 2

D. Freitas asked that we use more-consistent terms throughout the report. We will review the report and strive to do so.

James Kelly
Bay Area Clean Water Agencies
April 12, 2004

Comment Letter Page 2

Regulatory Impact of the Proposed TMDL on POTWs

James Kelly stated that the Water Quality Attainment Strategy could affect publicly owned treatment works (wastewater treatment plants). However, we do not intend for it to apply to brackish portions of urban creeks near San Francisco Bay. We have proposed no allocations or implementation actions for publicly owned treatment works. More to the point, we are not

proposing any new water quality objectives to comply with. Therefore, the Water Quality Attainment Strategy will not affect publicly owned treatment works.

Water Quality Conditions
J. Kelly requested that we address recent data suggesting that diazinon and toxicity are declining in urban creeks. In Section 2 (Water Quality Conditions), we acknowledge that diazinon and aquatic toxicity now appear in urban creeks less frequently than in previous years. Much of the remainder of the report focuses on this trend, explores its implications for water quality, and proposes a plan to protect water quality in the future.

Impairment Assessment
J. Kelly asserted that recent data do not support some of our conclusions about toxicity in urban creeks. We acknowledge that data representing recent water quality conditions are much more limited than data collected during the 1990s. However, our statement that "some samples collected from urban areas, including some recent samples, have been lethal to *Ceriodaphnia dubia*" is supported by evidence cited in the report. Nevertheless, we will clarify Section 5 (Project Description) as follows:

> As discussed in Section 2, "Water Quality Conditions," diazinon concentrations in urban creeks throughout the Bay Area have ~~are~~ often been within the range of concentrations toxic to *Ceriodaphnia dubia*. Because no differences in pesticide use patterns are readily apparent among the various urban Bay Area watersheds, available evidence indicates that pesticide-related toxicity in urban creeks has been ~~is~~ a widespread problem.

J. Kelly also questioned whether the proposed diazinon target of 50 ng/l reliably indicates *Ceriodaphnia dubia* toxicity. We do not assume that diazinon concentrations above 50 ng/l indicate *Ceriodaphnia dubia* toxicity. *Ceriodaphnia dubia* is a toxicity test organism, and we use toxicity tests as one way, among many, to determine whether toxicity is a concern. *Ceriodaphnia dubia* toxicity correlates to adverse biological community responses, but *Ceriodaphnia dubia* survival does not preclude potential toxic effects to other organisms or biological effects not evaluated in toxicity tests. The Basin Plan's narrative toxicity objective is intended to protect all aquatic organisms (including benthic organisms), not just *Ceriodaphnia dubia*. The 50 ng/l diazinon concentration target corresponds to the California Department of Fish and Game's chronic water quality criterion for diazinon, which is intended to protect all aquatic life from diazinon. Chemical analyses and toxicity tests are both useful tools for evaluating water quality.

Comment Letter Page 3
Numeric Targets, Toxicity Targets
J. Kelly asserted that toxicity targets are inappropriate because the nature of toxicity may vary among sources and ambient water conditions. In our view, toxicity tests account for these factors in ways that simple chemical analyses cannot. For example, diazinon discharges meeting the proposed diazinon concentration targets may be unacceptable if combined with discharges of another organophosphorus pesticide with a similar mechanism of toxicity. Toxicity tests better account for the chemical interactions within mixtures.

J. Kelly also recommended that the proposed toxicity targets simply be triggers for Toxicity Identification Evaluations. Ideally, Toxicity Identification Evaluations would be completed whenever toxicity is observed in an urban creek (i.e., whenever $TU_a \geq 1$ or $TU_c \geq 1$). However, for practical reasons, Toxicity Identification Evaluations cannot be completed unless samples are relatively toxic. Therefore, Toxicity Identification Evaluations will not necessarily be appropriate

every time the toxicity targets are exceeded. We agree that Toxicity Identification Evaluation results can be used to identify pesticides for which water quality criteria and possibly chemical-specific numeric targets should be developed. Developing water quality criteria requires toxicity data for a number of species. Section 10 (Strategy and Proposed Actions) identifies proposed actions to obtain such information when needed. New targets could be adopted through adaptive management, as discussed in Section 11 (Monitoring and Adaptive Management).

Although we have proposed toxicity targets, we do not intend to change the Basin Plan's toxicity test provisions (see Basin Plan, Chapter 4, "Whole Effluent Toxicity Limits and Control Program"). Therefore, toxicity test requirements for publicly owned treatment works will remain unchanged.

Numeric Targets—Diazinon Targets
J. Kelly recommended waiting for the U.S. Environmental Protection Agency to adopt its proposed diazinon water quality criteria and then using those instead of the California Department of Fish and Game's criteria. The different criteria are both reasonable options for numeric targets; there are many reasonable ways to look at the same data. However, the U.S. Environmental Protection Agency's criteria are still in draft form, while the California Department of Fish and Game's criteria are final. The U.S. Environmental Protection Agency has been developing its diazinon water quality criteria for many years, and we cannot anticipate when it will complete its work. New information is continuously generated, but that is an insufficient reason for us to delay the Water Quality Attainment Strategy. While we consider available information as we receive it, we also defer to the expertise of the California Department of Fish and Game when it comes to deriving water quality criteria in accordance with U.S. Environmental Protection Agency guidance. Furthermore, as discussed in Section 7 (Numeric Targets), California Department of Fish and Game criteria are lower and potentially more protective of water quality. By choosing the lowest criteria available as numeric targets, we provide a greater inherent margin of safety and minimize the need for an explicit margin of safety (see Section 9 [Allocations]).

Carl Mosher
City of San Jose
April 12, 2004

Comment Letter Page 1
Introductory Comments
Carl Mosher noted shortcomings in available pesticide toxicity data and stated that, prior to adopting regulations, the Water Board should identify specific pesticides that impair urban creeks and their sources. We acknowledge that data availability varies among Bay Area creeks, as discussed in Section 2 (Water Quality Conditions) and stated in Section 5 (Project Description). Data are often lacking for many creeks because some municipal urban runoff agencies have not thoroughly characterized their receiving waters, a matter we can and will address through permit enforcement.

Our rationale for proposing actions to minimize the potential for future water quality impairment, as set forth in our report, is reasonable and compelling. Our findings will serve as the basis for a Basin Plan Amendment we intend to prepare. The Water Board may amend the Basin Plan whenever necessary to preserve water quality (Clean Water Act §303[e] and Porter-Cologne Water Quality Control Act §13240). Its authority is not limited to acting only after water quality standards have been violated and waters are impaired. In addition, we do not need to name specific pesticides that impair beneficial uses before proposing a Water Quality Attainment Strategy. Such

an approach would force us to wait for water quality standards to be violated before taking corrective actions.

C. Mosher also expressed a number of general concerns. In the responses below, we address his specific comments regarding the implementation burden to be placed on municipal urban runoff agencies, allocations pertaining to pesticide-related toxicity, the use of California Department of Fish and Game diazinon water quality criteria as numeric targets, and assertions that the our report misrepresents information.

Comment Letter Page 2

The proposed allocation scheme does not address upstream sources of diazinon

C. Mosher suggested that we propose allocations for sources other than municipal urban runoff agencies. We assign load and wasteload allocations to sources, not organizations or individuals responsible for the sources. By far the most important source of diazinon and pesticide-related toxicity in urban creeks is storm drains; therefore, we propose a wasteload allocation to storm drains. By law, municipal urban runoff agencies bear responsibility for storm drain discharges. However, Section 10 (Strategy and Proposed Actions) also includes actions to be taken by the Water Board, the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, County Agricultural Commissioners, the California Department of Consumer Affairs, the University of California, and private entities.

Section 6 (Source Assessment) and Section 8 (Linkage Analysis) describe how diazinon and other pesticides enter storm drain systems. Various parties are involved, including private citizens, structural pest control and landscape maintenance professionals, and to a far lesser extent, agricultural pesticide users. When these parties use pesticides such that the pesticides enter storm drain systems, the resulting discharges are the responsibility of municipal urban runoff agencies. There is no need for a separate allocation. As for specifying allocations for construction and industrial activities that do not discharge to storm drain systems, we have no evidence that such activities result in meaningful pesticide discharges. Not assigning allocations is a conservative approach in that it is equivalent to assigning allocations of zero.

Comment Letter Page 3

Separating the TMDL and the Water Quality Attainment Strategy (WQAS)

C. Mosher asserted that the TMDL can only address diazinon, not pesticide-related toxicity. We believe the Water Quality Attainment Strategy and TMDL are consistent with the §303(d) list of impaired waters. Our 2002 Preliminary Project Report reflected concerns about pesticide-related toxicity that resulted in Bay Area urban creeks being placed on the §303(d) list. We did not change the scope of our project with the 2004 Final Project Report, but we did revise the report to clarify our intentions. Consistent with pollution prevention principles, we do not intend to act to eliminate diazinon toxicity without considering the potential for such actions to result in new sources of toxicity. Therefore, the TMDL is an integral component of the Water Quality Attainment Strategy and cannot be separated from it. All the implementation actions listed in Section 10 (Strategy and Proposed Actions) relate to both the Water Quality Attainment Strategy and TMDL.

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

C. Mosher objected to our proposed toxicity targets because the §303(d) list only refers to diazinon. However, targets need not be limited to the specific pollutants identified on the §303(d) list. Our selection of multiple targets is consistent with National Research Council recommendations that biological criteria be used in conjunction with chemical and physical criteria to measure whether beneficial uses are achieved. As pointed out by the comment, U.S. Environmental Protection

Agency guidance states that that targets should equate to attainment of water quality standards. In this case, the applicable water quality objective is the narrative toxicity objective. There is no numeric objective for diazinon. Therefore, the proposed toxicity targets relate directly to the applicable water quality standard.

Comment Letter Page 4

Page 13

C. Mosher requested graphics illustrating the data presented. The information in our report is commensurate with the detail provided by the cited reference (Alameda Countywide Clean Water Program and Alameda County Flood Control and Water Conservation District, *Characterization of the Presence and Sources of Diazinon in the Castro Valley Creek Watershed*, June 1997). We will include a copy of that report in the administrative record. Our description of the study's findings is intended to be informative, but it does not directly affect the proposed targets, allocations, or implementation plan; therefore, further elaboration is unnecessary.

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C. Mosher pointed to text describing several important information gaps as evidence that more information is needed before the Water Board takes a regulatory action. However, in our report, we make a compelling case that some diazinon replacements (pyrethroids, in particular) may pose serious concerns for water quality. The Water Board must balance available information against apparent uncertainties before it acts. Because our mission is to restore and maintain the integrity of our region's waters, we propose regulatory actions to adopt an implementation plan that protects beneficial uses and ensures that information gaps will be closed.

Page 61

C. Mosher asked that we clarify in the text that the U.S. Environmental Protection Agency's water quality criteria for diazinon are draft criteria. (The California Department of Fish and Game's criteria are final.) We will, and as requested, we will also include the word "freshwater" when referring to the water quality criteria.

Comment Letter Page 5

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C. Mosher noted that urban creek water samples exceeding the proposed toxicity targets may not be sufficiently toxic to allow Toxicity Identification Evaluations to be completed. Setting the proposed toxicity targets at $TU_a = 1$ and $TU_c = 1$ is consistent with the Basin Plan's narrative toxicity objective. We agree that samples close to 1 TU may not be toxic enough to complete rigorous Toxicity Identification Evaluations. This challenge is not new. Our proposed Water Quality Attainment Strategy calls on municipal urban runoff agencies to specify the circumstances that would trigger Toxicity Identification Evaluations in a monitoring plan (see Section 11 [Monitoring and Adaptive Management]).

C. Mosher also brought up the potential for pollutants other than pesticides to cause toxicity. We acknowledge the potential for non-pesticide toxicity in Section 5 (Numeric Targets) and Section 11 (Monitoring and Adaptive Management). Toxicity caused by pollutants other than pesticides is beyond the scope of this Water Quality Attainment Strategy.

C. Mosher questioned the link between the proposed diazinon targets (California Department of Fish and Game criteria) and *Ceriodaphnia dubia* toxicity. However, we are not required to link the diazinon concentration targets to *Ceriodaphnia dubia* toxicity. As discussed in Section 8 (Linkage Analysis), we must link the proposed targets to identified sources. The targets themselves may or may not be linked to each other. In this case, the diazinon concentration targets and the toxicity

targets were derived separately and are intended to serve different purposes. Moreover, we are not proposing the diazinon water quality criterion of 50 ng/l as a water quality objective as C. Mosher suggested.

Page S-2
C. Mosher requested an explanation for moving forward with the Water Quality Attainment Strategy and TMDL before adopting numeric water quality objectives for diazinon. Other regions (specifically, the Central Valley region) have adopted the California Department of Fish and Game's water quality criteria as water quality objectives for certain waters. In the Bay Area, there is no need for a numeric diazinon objective because the existing narrative toxicity objective is adequate to protect beneficial uses. Moreover, because the U.S. Environmental Protection Agency's phaseout of diazinon is expected to eliminate almost all Bay Area diazinon use, a numeric diazinon objective would serve little purpose.

C. Mosher asked that we consider the U.S. Environmental Protection Agency's draft diazinon water quality criteria. In Section 7 (Numeric Targets), we considered the technical merits of both the California Department of Fish and Game criteria and the U.S. Environmental Protection Agency criteria. We concluded that both sets of water quality criteria could reasonably serve as TMDL targets. We then selected the California Department of Fish and Game criteria for reasons explained in the report.

Comment Letter Page 6
Page 10
C. Mosher objected to reporting the 7-day LC_{50} for exposure of *Ceriodaphnia dubia* to diazinon as 100 ng/l and questioned whether diazinon toxicity depends on exposure duration. The reference we cited (Alameda County Urban Runoff Clean Water Program, *Identification and Control of Toxicity in Storm Water Discharges to Urban Creeks*, March 7, 1995) contains the results of reference tests S.R. Hansen & Associates completed using diazinon concentrations from 80 ng/l to 10,000 ng/l in "clean" laboratory water. After a 7-day exposure, S.R. Hansen & Associates observed no *Ceriodaphnia dubia* mortality at 80 ng/l and 100% mortality at 156 ng/l. Therefore, the LC_{50} was between these concentrations (roughly 100 ng/l). This study was not extensive, and others could find different results. Nevertheless, diazinon toxicity is related to the duration of exposure (Alameda County Urban Runoff Clean Water Program, *DUST Marsh Special Study FY 93-94*, January 27, 1995). The data in Table 2.1 are only for informational purposes and do not affect the proposed targets, allocations, or implementation plan.

Page 10, Page 15-footnote h
C. Mosher requested more information about the Crandall Creek Toxicity Identification Evaluation (Alameda County Urban Runoff Clean Water Program, *DUST Marsh Special Study FY 93-94*, January 27, 1995). That study involved one water sample. The average of two diazinon concentration measurements for the sample was about 250 ng/l. On the basis of a dilution series of diazinon concentrations in "clean" laboratory water, the 4-day LC_{50} was roughly 400 ng/l (1.7 x the LC_{50} of 250 ng/l—the 300 ng/l we reported was an error). The study concluded that, within the range of the study's uncertainty, diazinon concentrations explained the toxicity found in the sample. The study acknowledged that other toxic substances could also be in the sample at sub-toxic concentrations. In fact, the sample contained a substance that appeared to be a pyrethroid. Due to analytical constraints, however, the presence of a pyrethroid was not confirmed. The study, which we will include in the administrative record, supports our conclusion that diazinon has caused toxicity in urban creeks.

C. Mosher asked that the text clarify that the California Department of Fish and Game's diazinon water quality criterion of 50 ng/l does not reflect the diazinon concentration that adversely affects *Ceriodaphnia dubia*. Section 7 (Numeric Targets) explains that the water quality criteria are derived from toxicity data for a number of species, not just *Ceriodaphnia dubia*.

Comment Letter Page 7

Page 16

C. Mosher asked some specific questions in the context of the key points at the end of Section 2 (Water Quality Conditions). These key points are intended to provide a brief summary. The statement that Toxicity Identification Evaluations using *Ceriodaphnia dubia* concluded that diazinon caused the toxicity is a generalization based on the preceding text. Diazinon was the primary cause of toxicity by far, even though other toxic substances could also have been present in the samples tested. The scopes of the Toxicity Identification Evaluations varied and are described in the cited references, which will be included in the administrative record.

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C. Mosher asserted that toxicity in urban creeks may not be due to diazinon. However, available information overwhelmingly supports our conclusion that diazinon has caused most of the toxicity observed in Bay Area urban creeks since the 1990s. We are aware of no information that refutes this conclusion. We propose toxicity targets in addition to diazinon concentration targets because we acknowledge that other pollutants, especially other pesticides, can potentially contribute to toxicity.

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C. Mosher asserted that all pollutants contributing to urban creek toxicity must be identified before moving forward with the Water Quality Attainment Strategy. Our report identifies diazinon as the pollutant primarily responsible for the toxicity observed in Bay Area urban creeks. We do not claim that no other pollutants contribute to the observed toxicity; however, little information is available about such contributions and we believe them to be relatively minor at this time. The proposed toxicity targets account for such uncertainties. We do not need to specifically identify all pesticides or other pollutants causing or contributing to toxicity before implementing management actions to prevent toxicity. Section 11 (Monitoring and Adaptive Management) describes monitoring to identify pesticides other than diazinon that may, now or in the future, contribute to toxicity. Based on available information, we propose to implement the Water Quality Attainment Strategy now to restore water quality and prevent future impairment. We can modify the implementation plan in the future if new information about specific toxic substances becomes available and demonstrates a need to revise the Water Quality Attainment Strategy.

C. Mosher suggested that a diazinon concentration of 440 ng/l (the 2-day LC_{50} for *Ceriodaphnia dubia*) be used to screen creeks for toxicity. We considered the advantages and disadvantages of basing numeric targets on single-species toxicity tests (see Table 7.2). Using a diazinon concentration of 440 ng/l as a screening level for toxicity is inappropriate because doing so may not protect all species, may not adequately account for chronic effects, and may not account for potential chemical interactions. The California Department of Fish and Game's water quality criteria are far below 440 ng/l, and water quality criteria need to be met to protect aquatic life.

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C. Mosher characterized our explanation of the differences between the California Department of Fish and Game and U.S. Environmental Protection Agency water quality criteria as misleading.

Nevertheless, proposing lower diazinon concentration targets is more protective than proposing higher targets and provides a greater inherent margin of safety. We will revise the text as follows:

> The California Department of Fish and Game criteria are lower because the U.S. Environmental Protection Agency considered some different ~~an additional~~ acute toxicity studies~~y~~ and did not rely on a particular chronic toxicity study (CDFG 2001).

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C. Mosher pointed out an error in our summary of two studies and noted that the U.S. Environmental Protection Agency did not use these studies in deriving its water quality criteria. Whether the U.S. Environmental Protection Agency relied on certain studies for its criteria has no bearing on whether we can cite the studies in our report. However, we should cite the information correctly. According to the studies, diazinon exposure at 1,000 ng/l—not 100 ng/l—could cause sub-lethal effects in fish. Considering this correction, the studies no longer support the point we made in our report; therefore, we will remove the sentence about the effects of diazinon on salmonids.

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C. Mosher suggested that other regions relied on the California Department of Fish and Game diazinon water quality criteria instead of the U.S. Environmental Protection Agency's draft criteria because the U.S. Environmental Protection Agency's draft criteria were unavailable. To the contrary, although the U.S. Environmental Protection Agency formally published its draft criteria in December 2003, the draft criteria had been widely circulated since August 2000, well before the other regions adopted their TMDLs. In any case, the U.S. Environmental Protection Agency has still not formally adopted these water quality criteria, and we are free to exercise our own independent judgment in proposing numeric targets.

Page 72

C. Mosher asserted that the proposed diazinon concentration targets (the California Department of Fish and Game criteria) are overly conservative and not based on the best available science. However, U.S. Environmental Protection Agency staff wrote the following regarding the California Department of Fish and Game criteria (Heidi Bell, April 3, 2002):

> The approach for the derivation of the diazinon aquatic life criteria (ALC) by the California Department of Fish and Game (DFG) is consistent with EPA's guidelines for deriving ALC. Although the DFG criteria values are different from those found in EPA's diazinon ALC, the DFG approach is reasonable and these differences are within the range of discretion provided by the guidelines methodology.
>
> …since [EPA] criteria serve as recommendations, it is within the purview of a state to derive a criteria [*sic*] which may be more stringent than that recommended by EPA….

We will cite this U.S. Environmental Protection Agency memorandum in our report and include it in the administrative record.

Page 87

C. Mosher suggested that the report inadequately supports the linkage between the toxicity and diazinon concentration targets. He also pointed out that toxicity may not go away when diazinon concentrations decline. He advocated separation of the toxicity and diazinon strategies. The

proposed targets need not be linked to each other. As discussed in Section 8 (Linkage Analysis), we must link the targets to the sources, not to each other. Regarding our expectations for meeting the toxicity targets, we will revise the text for clarity as follows:

> Because available information ~~does not~~ indicates that diazinon, not other pesticides, causes almost all existing 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.

The targets and implementation strategies for toxicity and diazinon concentrations cannot be separated. We agree that the Water Quality Attainment Strategy cannot focus only on diazinon. A strategy that addresses diazinon cannot ignore potential interactions with other pesticides or potential substitutions of replacement pesticides. Therefore, our implementation plan does not address diazinon by itself (see Section 11 [Strategy and Proposed Actions]).

Final Comment
C. Mosher suggested including the California Department of Fish and Game diazinon water quality criteria report as an appendix to our report. As with all references cited in our report, we will include this one in the administrative record. We see no reason to append it to our report.

Douglas Okumura
California Department of Pesticide Regulation
April 14, 2004

Comment Letter Page 1
Page 8
Douglas Okumura noted that we presented older and more recent monitoring data separately. We intend to include all available information about past and present creek conditions. In future drafts, we will break up the section titled "Recent Data" and distribute this information between the sections titled "Toxicity in Urban Creeks" and "Diazinon Concentrations in Urban Creeks."

Page 17, Section 3
D. Okumura requested that we define "structural pest control" and "landscape maintenance." We will incorporate the following (or similar) definitions into the Water Quality Attainment Strategy. We are also open to other definitions the California Department of Pesticide Regulation proposes.

> "Structural pest control" means any pest control work performed within or on buildings and other structures.
>
> "Landscape maintenance" means any pest control work performed on landscape plantings (i.e., natural or planted ornamental or turf vegetation).

Page 27, paragraph 5
D. Okumura noted that the University of California Statewide Integrated Pest Management Program is not a regulatory agency. Its role is important, however, so we want to include it in our report, and Section 4 (Regulatory Oversight) is the most logical place to discuss it. Nevertheless, we will clarify in the text that the University of California Statewide Integrated Pest Management Program has no regulatory authority.

Page 26, paragraph 3 (and elsewhere)
D. Okumura pointed out that the California Department of Pesticide Regulation's authorities and mandates are set forth in the Food and Agricultural Code. We will replace "Agriculture" with "Agricultural" throughout the report.

Page 28, paragraph 1
D. Okumura suggested that we add some text regarding the stated purpose of the Federal Insecticide, Fungicide, and Rodenticide Act. We will refer to U.S. Code, Title 7, §136a(a), which states that the U.S. Environmental Protection Agency may limit the distribution, sale, or use of any pesticide to prevent unreasonable adverse effects on the environment. U.S. Code, Title 7, §136(z) defines "unreasonable adverse effects on the environment" to include (1) any unreasonable risk to humans or the environment, taking into account the economic, social, and environmental costs and benefits of pesticide use, or (2) a human dietary risk from pesticide residues in or on any food inconsistent with established tolerances.

Comment Letter Page 2
Page 29, last paragraph
D. Okumura noted that the California Department of Pesticide Regulation registers pesticide products, not active ingredients. Therefore, it does not regulate the manufacture of pesticides or their formulation into products. It does, however, regulate pesticide distribution, sales, and use. We will change the text as suggested to reflect this.

Page 30, paragraph 3
D. Okumura noted that the California Code of Regulations (Title 3, §6158) does not define "environmental harm." We intended our text to describe the California Department of Pesticide Regulation's authorities and discretion. The California Department of Pesticide Regulation is authorized, with substantial discretion, to ensure that pesticides are not used in a manner that results in discharges that exceed water quality standards.

Page 33, paragraph 1 and bullet 2
D. Okumura again noted that the University of California Statewide Integrated Pest Management Program has no regulatory authority. As indicated above, we will clarify this in the text.

Page 33, paragraph 4
D. Okumura asserted that the U.S. Environmental Protection Agency may find it difficult to coordinate its pesticide regulatory programs with its water quality regulatory programs due to its specific legal mandates and authorities. In our report, we will clarify that the U.S. Environmental Protection Agency's Office of Pesticide Programs and Office of Water implement different legal mandates and authorities. However, through these agencies' existing authorities, they can close most of the regulatory gaps identified in Section 4 (Pesticide Oversight) and regulate pesticides such that their use does not result in discharges that violate water quality standards. For example, the U.S. Environmental Protection Agency does not need new authorities to do the following:

- Study urban application scenarios during the registration process.
- Collect data needed to derive water quality criteria.
- Use water quality criteria as effects thresholds in risks assessments.
- Consider the potential for pesticide-related sediment toxicity.

Page 35, last paragraph
D. Okumura observed that our report states that the California Department of Pesticide Regulation can exercise its authorities to help close data gaps, but he noted that the report does not specify which authorities can address which gaps. We believe we provided sufficient detail for the time being, but we will consider providing more information in the future, particularly if the California Department of Pesticide Regulation clarifies how its specific authorities can be used to address identified gaps. In the meantime, we will add some information about the California Department of Pesticide Regulation's reevaluation process to the text describing its regulatory oversight role.

Page 44, last paragraph and Figure 6.2
D. Okumura questioned the treatment of manufacturers, formulators, distributors, and retailers as "co-dischargers," and requested legal citations that support this approach. We do not consider manufacturers, formulators, distributors, or retailers to be dischargers, and we do not intend to require them to obtain permits. We are required to identify sources of pollutants that cause water quality impairment, and Section 6 (Source Assessment) identifies the sources of diazinon and other pesticides in urban creeks. Storm drains are sources in so far as they convey pesticides to urban creeks. However, the origin of most pesticides is the manufacturing process undertaken by the pesticide registrants. As indicated in Section 10 (Strategy and Proposed Actions), we intend to assign certain responsibilities to pesticide manufacturers, formulators, distributors, and retailers, although we acknowledge that actions assigned to these parties will be voluntary.

Page 52, last paragraph and bullets
D. Okumura suggested rewording the text to better reflect the heading "Primary Opportunities to Reduce Pesticide Discharges," and we will revise the text for clarity.

Comment Letter Page 3
Page 65, Table 8.1
D. Okumura noted that Table 8.1 lists bifenthrin twice. We will delete bifenthrin from the first line. We intended to include it with the other pyrethroids.

Page 68, paragraph 3
D. Okumura pointed out that monitoring is needed to determine with certainty that the increased use of many pesticides is resulting in increasing discharges to urban creeks. We will more clearly explain our inference that, so far as any pesticide runoff occurs following pesticide use, increases in use result in increases in discharges. Available information presented in Section 2 (Water Quality Conditions) and Section 3 (Pesticide Use Trends) supports this conclusion.

Page 77, paragraph 4
D. Okumura suggested that to "discourage" the use of pesticides that threaten water quality connotes taking regulatory action, whereas "encouraging" actions that do not threaten water quality may be easier. We will revise the text to explain that we intend to "encourage" alternatives that do not threaten water quality and "discourage" pesticide uses that do. If adopted, the draft Basin Plan Amendment we are preparing will contain regulatory provisions. We hope to work closely with the California Department of Pesticide Regulation to ensure that these provisions ensure attainment of water quality standards in the most cost-effective manner possible. We will evaluate economic effects to the extent required of us when we propose the draft Basin Plan Amendment.

Page 80, paragraph 1
D. Okumura objected to the suggestion that the Water Board might direct the California Department of Pesticide Regulation to use its authorities in any particular manner. The Water Board is obligated to amend the Basin Plan as necessary to protect water quality though attainment

of water quality standards. The Basin Plan Amendment we are drafting will establish a Water Quality Attainment Strategy and TMDL designed to attain water quality standards, and it is within the Water Board's role and responsibility to call out where actions by other agencies may be necessary. We recognize that this implies that use of California Department of Pesticide Regulation authorities will be an essential component of the implementation plan. As such, we seek additional input on how to recognize such authorities and potential actions.

Page 81, WB-8
D. Okumura requested modifying proposed Water Board Action WB-8 so as not to imply that municipalities should take pesticide-related regulatory actions. Action WB-8 says permits will require dischargers to support pesticide regulatory actions that protect water quality. It does not suggest that municipalities will adopt their own regulations where they are not authorized to do so. For clarity, we will modify Action WB-8 as follows:

> Incorporate within municipal urban runoff National Pollutant Discharge Elimination System permits necessary requirements to actively support pesticide regulatory actions taken by regulatory agencies to ~~that~~ protect water quality.

Page 81, WB-15
D. Okumura voiced support for proposed Water Board Action WB-15, which relates to developing tools for evaluating and tracking the success of education and outreach programs. The State Water Resources Control Board recently awarded a Pesticide Research and Identification of Source and Mitigation (Proposition 13) grant that will specifically fund efforts to develop and implement tools to measure the effectiveness of pesticide outreach programs and the practices they promote.

Page 81, WB-16
D. Okumura opined that the usefulness of existing pesticide analysis methods is questionable because they were developed to determine compliance with pesticide residue tolerances. This may be true. However, even if the proprietary analytical methods submitted to the U.S. Environmental Protection Agency were developed specifically to monitor water quality, they would not be readily available to public and commercial enterprises engaged in urban creek monitoring. Therefore, public monitoring efforts cannot use such methods (see the discussion of "Chemical Analysis Methods" in Section 4 [Pesticide Oversight]).

Page 83, URMP-1
D. Okumura requested modifying proposed Action URMP-1 so as not to imply that municipalities should take pesticide-related regulatory actions. Action URMP-1 involves municipal urban runoff agencies *supporting* regulatory actions, not *taking* regulatory actions. For clarity, we will modify Action URMP-1 as follows:

> Develop and implement plans to support pesticide regulatory actions taken by regulatory agencies that protect water quality, to adopt least toxic management practices (such as integrated pest management) within municipal operations and promote such practices within local and regional communities, and to characterize conditions within urban creeks receiving pesticide runoff.

Page 83, URMP-3 and 7 (and elsewhere)
D. Okumura suggested that we define the term "conventional pesticides." We will consider defining the term, but a specific definition may prove elusive. Alternatively, we may minimize our use of the term by rephrasing sentences that use it.

Comment Letter Page 4

Page 84, URMP-14

D. Okumura suggested adding "to the extent authorized by law" to the end of Action URMP-14, which calls for municipal urban runoff agencies to work with the California Department of Pesticide Regulation to ensure that pesticide applications comply with water quality laws implemented through the Basin Plan. As we prepare the Basin Plan Amendment, we will consider and account for existing regulatory authorities and constraints.

Page 85, CAC-1

D. Okumura noted that County Agricultural Commissioners may be constrained in their ability to implement proposed Action CAC-1 ("continue and enhance enforcement related to overuse and misuse of pesticides…") by their contracts with the California Department of Pesticide Regulation and county budgets. Working with the California Department of Pesticide Regulation to modify existing contracts with County Agricultural Commissioners may be one way to implement proposed Action CAC-1. In addition, Bay Area County Agricultural Commissioners represent counties that operate pursuant to National Pollutant Discharge Elimination System (NPDES) permits, and permit requirements must be consistent with the Basin Plan. Municipalities could meet permit requirements by working with their County Agricultural Commissioners to implement specific actions in addition to those included in their California Department of Pesticide Regulation work plans. We have not determined what these actions might be and would develop them in consultation with County Agricultural Commissioners, the California Department of Pesticide Regulation, and municipal urban runoff agencies.

Page 85, CDCA-2

D. Okumura noted that modifying structural pest control education requirements as alluded to in proposed Action CDCA-1 would require formal rulemaking. Both Action CDCA-1 and Action CDCA-2 would be subject to the rulemaking process; therefore, it will be important for the California Department of Pesticide Regulation and the Water Board to lend assistance and support to the California Department of Consumer Affairs.

Page 98, paragraph 1

D. Okumura asked that we revise the text to reflect that the California Department of Pesticide Regulation's Urban Pesticide Initiative Workgroup will develop staff recommendations for management to consider. The workgroup will not determine the agency's future pesticide activities without management oversight. We will revise the text as suggested.

Mary Louise Flint
University of California
April 2, 2004

Comment Page 1

Page 33

Mary Louise Flint suggested additional text regarding the University of California's Pest Management Guidelines for urban and agricultural pests. We will revise the text.

Page 86

M. L. Flint recommended adding another action for the University of California's Statewide Integrated Pest Management Program related to serving as an information resource on alternative pest management practices. We will revise the text as suggested.

Page 96.
M. L. Flint corrected information pertaining to the University of California Master Gardener IPM/Water Quality Education and Outreach grant. Since submitting this comment, the University of California Statewide Integrated Pest Management Program cancelled that grant, so the issue is moot. We will revise the text accordingly.

Page 99
M. L. Flint provided additional information about the University of California Statewide Integrated Pest Management Program. We will incorporate some of this information into Section 12 (Early Implementation).

Stacy Carlsen
Marin County Agricultural Commissioner
April 9, 2004

Comment Page 1
Paragraph 1
Stacy Carlsen questioned the rationale for including Marin County urban creeks on the §303(d) list of impaired waters. The purpose of the Water Quality Attainment Strategy and TMDL is not to determine whether urban creeks should be placed on the §303(d) list. That decision was made several years ago. Section 5 (Project Description) explains the rationale for the listings. We acknowledge that data availability varies among Bay Area urban creeks. In some areas, few or no measurements of creek conditions have been made. However, we chose not to require extensive (and expensive) monitoring in every creek, particularly when the land uses of many urban creek watersheds are similar and pollutant loads are expected to be similar as well. Monitoring funds typically come from public sources, including the State of California or, more often, municipal urban runoff agencies, including Marin County and Marin County cities. We chose not to insist on more-extensive monitoring so resources could be devoted to addressing this regional problem.

Paragraph 2
S. Carlsen noted that declining diazinon use makes the impairment of Marin County urban creeks less likely. We agree that diazinon use has declined substantially throughout the Bay Area. However, use of other pesticides is increasing, and existing information suggests that use of certain replacement pesticides may also pose toxicity risks in urban creeks. Therefore, a Water Quality Attainment Strategy is needed for all urban creeks within the Water Board's jurisdiction. Pursuant to Clean Water Act §303(d)(1), the Water Quality Attainment Strategy will meet TMDL requirements by addressing the urban creeks formally designated as impaired. Pursuant to §303(d)(3), it also address waters not listed as impaired. We have no data suggesting that Marin County urban creeks are less affected by pesticides than other Bay Area urban creeks.

Paragraph 3
S. Carlsen opined that all Marin County creeks should be removed from the §303(d) list and offered to assist the Water Board in monitoring Marin County creeks. While we do not intend to initiate a process leading to the removal of Marin County creeks from the §303(d) list, we appreciate the interest in contributing to urban creek monitoring programs. The Clean Estuary Partnership developed a monitoring plan for diazinon and pesticide-related toxicity in Bay Area urban creeks, and we expect the Marin County Stormwater Pollution Prevention Program to contribute to monitoring efforts in one way or another.

Diane Fleck and Debra Denton
U.S. Environmental Protection Agency
April 29, 2004

Comment Page 1
General Comments

1. Diane Fleck and Debra Denton noted that the Water Quality Attainment Strategy focuses on some pesticides more than others, and asked that we clarify exactly which pesticides it covers. The Water Quality Attainment Strategy focuses on the applicable Basin Plan water quality objective, which is the narrative toxicity objective. The toxicity observed in urban creeks has been attributed to diazinon, but as the U.S. Environmental Protection Agency phases out diazinon, other pesticides are replacing it. We explored the ramifications of changing pesticide use practices and learned that the diazinon phaseout may not fully address the potential for some pesticide use to result in toxic discharges to urban creeks. For example, we learned that there are systemic regulatory gaps that apply to all pesticides (see Section 4 [Pesticide Oversight]). Because naming all pesticides that exist now or could exist in the future is impractical, we focus on pyrethroids to illustrate our concerns. Pesticide use will continue to evolve. As additional information becomes available, we may discover that pyrethroids pose inconsequential water quality risks or that other pesticides pose substantial risks. Therefore, we intend to address pesticides other than diazinon generally. By focusing on diazinon and pesticide-related toxicity, we avoid placing undue emphasis on any particular pesticides. We will draft a Basin Plan Amendment that is flexible enough protect water quality in light of future changes in pesticide use.

2. D. Fleck and D. Denton pointed out that the Water Quality Attainment Strategy does not address Petaluma River agricultural sources. Therefore, as suggested in a Table 1.1 footnote, the proposed Water Quality Attainment Strategy may not meet TMDL requirements for the Petaluma River. If not, the Petaluma River will remain on the §303(d) list of impaired waters and a separate TMDL could be necessary. Future monitoring or other actions could also support delisting the Petaluma River.

3. D. Fleck and D. Denton indicated that urban creeks that do not currently appear on the §303(d) list of impaired water should be added to the list before completing a TMDL for them. They expressed specific concerns about a recent Superior Court decision regarding the Los Angeles River Trash TMDL. The Water Quality Attainment Strategy will address the TMDL requirements for impaired waters pursuant to Clean Water Act §303(d)(1). At the same time, pursuant to Clean Water Act §303(d)(3), it will address TMDL requirements for urban creeks that have not been formally designated as impaired. If we act now to ensure that water quality standards will be met in all urban creeks, there will be no reason to pursue the administrative task of adding new waters to the §303(d) list. With respect to the Los Angeles River Trash TMDL decision, the decision is not precedent-setting and not binding on our Water Board. Furthermore, the Los Angeles Regional Water Quality Control Board and the State Water Resources Control Board have appealed the decision, and we believe they will prevail before the Court of Appeal. In any case, the facts for this Water Quality Attainment Strategy and TMDL differ from those of that case.

4. D. Fleck and D. Denton recommended clarifying the text relating to interactions among pesticides and other chemicals, and referred to specific studies to review. We will review the studies and cite them as appropriate.

5. D. Fleck and D. Denton suggested differentiating between Basin Plan objectives and U.S. Environmental Protection Agency criteria in terms of U.S. Environmental Protection Agency's three-pronged approach to water quality protection. To us, a reference to the three-pronged approach seems out of place in the paragraph they cited, which focuses on why concentration targets developed using U.S. Environmental Protection Agency guidelines are appropriate TMDL targets. We want to avoid suggesting that existing Basin Plan objectives are inadequate and that the Water Board should adopt the proposed targets as water quality objectives.

6. D. Fleck and D. Denton recommend clarifying the description of how water quality criteria are developed by providing additional information. One of the challenges we have in preparing staff reports is ensuring that the information we provide is readily understandable to our stakeholders and, most importantly, the Water Board, whom we will ask to approve the Water Quality Attainment Strategy. We believe excessive detail may distract our readers from the more fundamental concepts we are presenting. Therefore, while we appreciate the clarity the U.S. Environmental Protection Agency is adding to the administrative record (all comments will be included in the record), we prefer not to revise the text as suggested.

Specific Comments

D. Fleck and D. Denton offered numerous specific recommendations. In response to comments 1-5, 7, 13, 14, 16-20, 22-25, 27, 30, and 32, we will revise the text as suggested or make similar revisions that address the underlying issues. In some cases, we will revise the text to improve clarity. Comments 6, 8-12, 15, 21, 26, 28, 29, and 31 require more explanation, as provided below.

6. D. Fleck and D. Denton asked that we confirm the reported detection limit of 5 ng/l, which we have done, and provide the U.S. Environmental Protection Agency method number, which is 8141A.

8. D. Fleck and D. Denton asked that we indicate which Water Board commissioned the study titled "Insecticide Market Trends and Potential Water Quality Implications." The term "Water Board" is defined on page S-1 and page 3. It refers to the San Francisco Bay Regional Water Quality Control Board.

9. D. Fleck and D. Denton asked that we clarify the counties reflected in Figures 3.3 through 3.5. The text reads, "Figures 3.3 through 3.5 present recent trends in reported use for the selected pesticides for 1999 through 2002 for the nine Bay Area counties." We will add the words "Bay Area" to the figure titles.

10. D. Fleck and D. Denton recommended rewording "pyrethroid alternatives" to refer to "alternatives (pyrethroids)," but this revision would change our meaning. Pyrethroids are not the only alternatives. While various alternatives may cause water quality concerns, the pyrethroids pose the greatest concerns.

11. D. Fleck and D. Denton asked us to cite our sources for the range of pyrethroid concentrations we indicated could be toxic to *Ceriodaphnia dubia*. We will cite "Miller et al. 2002." We will also add a citation to "San Francisco Bay Regional Water Quality Control Board 2003a" and restate the range as "about 70 ng/l to 700 ng/l." We will clarify that these concentrations are LC_{50}'s (concentrations toxic to 50% of test organisms).

12. D. Fleck and D. Denton asked that we replace our "Denton 2001" citation with "Holcombe et al. 1982." If possible, we will review this reference and edit the text and citation as appropriate.

15. D. Fleck and D. Denton asked that we identify the water quality issues the U.S. Environmental Protection Agency's registration process omits. The bullet points below the cited paragraph (pages 33 to 35) describe the omitted water quality issues.

21. D. Fleck and D. Denton recommended removing "no effect more than 20% greater than observed in control samples" as an interpretation of "no observed adverse effects concentration." In the process of preparing earlier drafts of the numeric targets, some other stakeholders expressed concerns that an effect could be statistically significant, yet inconsequentially small. They recommended that we propose the approach used by the Regional Monitoring Program for Trace Substances, as expressed by its Pesticide Workgroup. Therefore, we prefer to retain this alternative as an option.

26. D. Fleck and D. Denton requested clarification regarding where the Basin Plan's narrative toxicity objective applies (e.g., at the edge of the mixing zone). We do not interpret the Basin Plan to prohibit toxicity anywhere within urban creeks, including where storm drain discharges mix with ambient waters. When waters are impaired, we cannot assume that assimilative capacity exists to provide dilution.

28. D. Fleck and D. Denton suggested rephrasing the text to indicate that the U.S. Environmental Protection Agency water quality criteria and the California Department of Fish and Game criteria are both "appropriate" for target development (as opposed to "reasonable"). We prefer not to revise the text in this way because we wish to avoid suggesting that both sets of criteria should be adopted as targets. One set of targets is sufficient.

29. D. Fleck and D. Denton suggested specifying that small amounts of diazinon runoff can be sufficient to exceed *diazinon* targets, as opposed to both the diazinon concentration targets and the toxicity targets. However, because the small fraction of diazinon that has reached Bay Area urban creeks has resulted in both diazinon concentrations that exceed the proposed diazinon targets and toxicity levels that exceed the proposed toxicity targets, we prefer not to revise the text.

31. D. Fleck and D. Denton suggested clarifying text stating that evaporation and deposition contribute to pesticide discharges via runoff. The text in question is within the key points that summarize the preceding section (Section 8 [Linkage Analysis]). The proposed revision could be interpreted to mean that evaporation and deposition occur via runoff, which we believe may be confusing. We believe the full text of the section provides sufficient context that the summary points are clear.