

Improving Urban Pesticide Regulatory Activities to Protect Water Quality



Annual Update 2005

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San Francisco Estuary Project*

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PREFACE

This is a report of research performed by TDC Environmental, LLC for the San Francisco Estuary Project. This report was prepared for the San Francisco Estuary Project to fulfill the annual reporting requirement in Task 2.3.3 of its grant agreement with the State Water Resources Control Board (Agreement Number 04-076-552-0) for the Urban Pesticides Pollution Prevention Project (UP3 Project).

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1.0 INTRODUCTION

1.1 Background

U.S. Environmental Protection Agency (U.S. EPA) has determined that use of registered pesticides is a source of water quality impairments.¹ This determination demonstrates that current U.S. EPA and California Environmental Protection Agency (Cal-EPA) procedures for regulating pesticides are insufficient to ensure that pesticide use does not cause violations of the Federal Clean Water Act and California Porter-Cologne Water Quality Control Act.

Federal law provides U.S. EPA with the ability to protect surface water from pesticides. California law provides the California Department of Pesticide Regulation (DPR) with the ability to protect surface water from pesticides. The different procedures used by pesticide regulators (i.e., the U.S. EPA Office of Pesticide Programs and DPR) and water quality regulators (i.e., the U.S. EPA Office of Water and California State and Regional Water Quality Control Boards) to manage pesticides create a regulatory gap that leaves states and municipalities responsible for solving water quality problems that could have been prevented at the time a pesticide was registered or re-registered.

In California, three types of agencies have water quality protection as their primary responsibility:

- The *State and Regional Water Quality Control Boards* (“Water Boards”) are responsible for maintaining water quality in California to protect designated uses of surface and ground waters. Among their important activities are solving water pollution problems (“impairments”) with regulatory plans (Total Maximum Daily Loads or TMDLs) and issuing permits for surface water discharges (National Pollutant Discharge Elimination System or NPDES permits).
- *Municipal wastewater treatment plants* are also known as sewage treatment plants or publicly-owned treatment works (POTWs). These plants receive anything that is discharged into urban sewer systems. While they can regulate large industrial dischargers and a few commercial businesses, they cannot readily control most commercial and all residential discharges. They have NPDES permits with specific numeric limits based on water quality standards.
- *Urban runoff management agencies* oversee urban stormwater runoff drainage systems, which generally flow directly to surface waters without treatment. Under the Clean Water Act, municipalities in urban areas are issued permits for their discharges through storm drains, making them legally responsible for any water pollutants that wash off when it rains (or when irrigation, car washing, and other water flows into gutters and storm drains).

This report refers to the above agencies as “California water quality agencies.”

Since late 1999, California water quality agencies have participated in selected U.S. EPA pesticide regulatory processes. Water quality agencies have also worked less formally with DPR. The goals of these activities are:

¹ Strauss, Alexis, Acting Director, Water Division, U.S. EPA Region 9 (1999). Letter to the California State Water Resources Control Board modifying California’s list of impaired water bodies (303[d] list), May 12. An impaired water body is one that does not meet water quality standards.

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1. To prevent surface water impairment.
2. To prevent violations of wastewater and stormwater NPDES permits.

Since mid-2004, the Urban Pesticide Pollution Prevention (UP3) Project has provided scientific and regulatory support to help California water quality agencies achieve these goals.

Although California's long history of pesticide-related water quality and NPDES permit compliance problems does not appear to be unique, California water quality agencies are currently the only water quality protection agencies in the nation to be working with U.S. EPA on these issues. California water quality agency teamwork with pesticide regulatory agencies and other stakeholders to address pesticide-related water quality problems in urban areas is also unique. No other U.S. state or region has established a program to address pesticide-related water quality issues related to use of pesticides in urban areas, even though California data show that at least half of all pesticide use occurs in urban areas.²

This is one of three reports prepared annually by the UP3 Project. (The other two reports are a review of California urban pesticide sales and use trends and a summary of recent scientific findings that are relevant to urban surface water quality management activities). The purpose of the UP3 Project is to provide education, outreach, and technical assistance for implementation of the Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks Water Quality Attainment Strategy and Total Maximum Daily Load (TMDL).³ The project is structured to mirror the three major elements of the TMDL Implementation Strategy: Outreach and Education, Science (Research and Monitoring), and Proactive Regulation. The San Francisco Estuary Project (SFEP) has been awarded California water bond grant funds from the State Water Resources Control Board to implement the UP3 Project through March 2007. TDC Environmental is providing technical support for the project.

1.2 Scope of This Report

This is the third review of California water quality agencies' urban pesticide water quality regulatory activities. In April 2003 and December 2004, TDC Environmental reviewed and evaluated the outcomes of these efforts.⁴ This report summarizes California water quality agency input into urban water quality-related pesticide regulatory actions since late 1999 and evaluates the outcomes from that input, focusing on information received since the December 2004 review.

This report summarizes the activities of many organizations. Leaders have included:

- San Francisco Bay Regional Water Quality Control Board
- California Stormwater Quality Association (CASQA)

² TDC Environmental (2005). *Urban Pesticide Use Trends Annual Report*, prepared for the San Francisco Estuary Project, March.

³ Johnson, B. (2005). 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. November.

⁴ TDC Environmental (2003). "Evaluation of Regional Efforts to Improve Existing Federal Regulatory Processes to Prevent Water Quality Impairment from Pesticides," memorandum from Kelly Moran to Bill Johnson, San Francisco Bay Regional Water Quality Control Board, April 23; TDC Environmental (2004). *Improving Urban Pesticide Regulatory Activities to Protect Water Quality. Annual Update 2004*, prepared for the San Francisco Estuary Project, December.

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- Tri-TAC (the technical advisory committee representing California municipal wastewater management agencies⁵)
- Los Angeles County Sanitation Districts (LACSD)
- San Francisco Department of the Environment (SF Environment)

Other members of the Urban Pesticides Committee have also participated in and supported these efforts.

1.3 Data Sources

This report is based on a review of:

- U.S. EPA pesticide risk assessments, registration eligibility decisions, and related documents;
- Analysis of written responses to California Water Quality Agency comments;
- Other regulatory decisions made by U.S. EPA and DPR relating to urban pesticides and surface water quality;
- U.S. EPA and California DPR presentations at interagency and public meetings;
- Informal discussion with U.S. EPA and DPR staff.

U.S. EPA's 2005 responses to California water quality agency comments are summarized and analyzed in Appendix B.

1.4 Report Organization

This report is organized as follows:

- *Section 1* (this section) provides the background and scope of the report.
- *Section 2* describes the scope of California water quality agency regulatory activities.
- *Section 3* summarizes past and upcoming regulatory activities.
- *Section 4* evaluates the outcomes of activities to date, to the extent that outcomes are known at this time (most regulatory processes that California water quality agencies have participated in are still underway).
- *Section 5* reviews the progress made to date on the recommendations of the April 2003 and December 2004 evaluations.
- *Section 6* gives the conclusions of the evaluation and provides recommendations for future activities.
- *Appendix A* summarizes U.S. EPA activity for urban pesticides of interest to California water quality agencies.
- *Appendix B* provides an analysis of U.S. EPA's 2005 responses to comments by California water quality agencies.

⁵ Tri-TAC is a technical advisory committee on state and Federal regulatory issues affecting publicly owned treatment works that is jointly sponsored by the League of California Cities, the California Association of Sanitation Agencies, and the California Water Environment Association.

2.0 SCOPE OF CALIFORNIA WATER QUALITY AGENCY REGULATORY ACTIVITIES

2.1 U.S. EPA

California water quality agencies participate in U.S. EPA pesticide regulatory processes affecting urban surface water quality as follows:

- Identify and track U.S. EPA regulatory processes with implications for urban surface water quality.
 - Keep an updated schedule of anticipated U.S. EPA public comment opportunities.
 - Review *Federal Register* notices, risk assessments, and relevant scientific information and consult with water quality agencies and other experts to determine whether specific pesticides under U.S. EPA review have the potential to affect surface water quality or municipal wastewater or urban runoff NPDES permit compliance.
- Identify specific information that would be valuable for California water quality agencies to share with U.S. EPA.
 - Identify specific shortcomings in U.S. EPA environmental risk assessments for urban pesticide uses that have the potential to adversely affect surface water quality or NPDES permit compliance.
 - Obtain missing information that is available from California or from the literature (e.g., water quality criteria, monitoring data, risk assessment methods, technical reports).
 - Identify critical data gaps in the information available to assess the impacts of urban pesticide use.
- Where potentially significant risks are evident, identify risk mitigation options.
 - Consider changes in allowable pesticide uses, application rates, label language and develop recommendations for feasible use changes to prevent water quality problems.
- Communicate information to U.S. EPA. Previous activities have determined that the primary mechanism for agencies to share relevant information with U.S. EPA is by writing letters. U.S. EPA's pesticide evaluation processes are set up to accept letters with technical information during public review periods. Less formal communications with U.S. EPA staff (telephone calls and meetings) are important to translate letters into concepts that are meaningful to pesticide regulators (who are used to different scientific and regulatory frameworks) and to provide context for comments.
- Review outcomes. U.S. EPA responds to the information provided by California water quality agencies several ways:
 - (1) by its actions in registration decisions and risk assessments,
 - (2) in formal written responses prepared for some—but not all—actions,
 - (3) informally in telephone conversations and e-mails.

Given the time and complexity involved in these tasks, California water quality agencies have found that they need scientific and regulatory support to complete the above tasks.

In 2005, the UP3 Project conducted most of the above activities (with the exception of communications to U.S. EPA about specific regulatory actions) and provided general scientific and regulatory support about pesticides to the California water quality agency community.

2.2 California Department of Pesticide Regulation

Primarily because DPR is a sister agency to the Water Boards within Cal-EPA, California water quality agency interaction with DPR has been relatively informal. For example, water quality agencies have participated in various work groups with DPR, such as the Urban Pesticides Committee and the Copper Antifouling Paint work group. Water quality agency representatives have met with DPR staff and management to discuss specific pesticide-related water quality problems (e.g., pyrethroids) and general regulatory issues (e.g., improving regulatory approaches to preventing water quality problems from pesticides).⁶

With the assistance of the UP3 Project, water quality agencies track DPR's routine activities, which include two types of regulatory decisions relevant to urban surface water quality for which public comment opportunities are offered.

1. Annual re-registration of all pesticides. Each year, DPR renews the registration of the more than 11,000 pesticide products registered for use in the state. The process is basically a formality—public documents include only a short summary of the legal requirements for renewing registrations. Requests for pesticide re-evaluation are commonly made at this time, although such requests can be submitted at any time.
2. Pesticide product registration. Each week, DPR announces which pesticide products it is considering for registration. Most pesticide product registration requests are for products with pesticide active ingredients and uses that have previously been approved in California.

While these routine regulatory decisions offer formal opportunities for public comments on water quality related issues, on a practical basis, monitoring these processes is difficult because public documents do not contain DPR's assessment of the potential water quality impacts from each product. For this reason, water quality agency input to formal DPR regulatory decisions has been limited to a few test cases that were initiated to improve understanding of DPR's registration process (see Section 3.2).

2.3 Coordination Among Agencies

California water quality agency pesticide regulatory activities have been coordinated primarily through the Urban Pesticides Committee (UPC). Since the mid-1990s, the UPC has served as a center for information exchange, coordination, and collaboration among local, regional, and state agencies seeking to end pesticide-related surface water toxicity problems. Today, the UPC is a collaboration of more than 180 individuals representing water quality regulatory agencies, pesticide regulatory agencies (U.S. EPA and DPR), agricultural commissioners, industry representatives, pesticide/water quality technical experts, municipal wastewater treatment plants, environmental nonprofits, community organizations, and stormwater management agencies. This network, which was organized by the San Francisco Bay and Central Valley Regional Water Quality Control Boards, is currently being managed by the UP3 Project.

⁶ Formally the Copper Antifouling Paint Sub-Workgroup of the Marina and Recreational Boating Workgroup of the Interagency Coordinating Committee (IACC). The IACC is a working group composed of 28 State agencies involved in implementing California's Nonpoint Source Pollution Control Program.

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The UP3 Project convenes bimonthly UPC meetings (which can be accessed by teleconference). The UP3 Project also maintains an information-filled web site (www.up3project.org) and an announcement-only e-mail list for UPC members to keep them up to date on regulatory, scientific, and educational program developments.

3.0 SUMMARY OF PAST AND UPCOMING REGULATORY ACTIVITIES

3.1 U.S. EPA

Together, California water quality agencies have sent U.S. EPA more than 130 letters since 1999. To participate in U.S. EPA re-registration processes for the following 22 pesticides, California water quality agencies sent more than 100 letters on environmental risk assessments and re-registration decisions (see Appendix A, Table A-2 for details):

- Atrazine
- Carbaryl
- Chlorpyrifos
- Diazinon
- Lindane
- Malathion
- Metam sodium
- Permethrin
- Pyrethrins
- Zinc pyrethione
- Miscellaneous antimicrobials (PHMB, Halohydrantoin, Pine oil, Phenol)
- Phenoxy herbicides (2,4-D, 2,4-DB, and MCPA)
- Synergists (Piperonyl butoxide and MGK-264)
- Wood preservatives (Arsenic and chromium compounds, Creosote, and Pentachlorophenol)

Initially, California water quality agencies focused on diazinon, chlorpyrifos, and lindane, which were proven sources of urban surface water impairment and NPDES permit compliance problems. Once U.S. EPA announced the cancellation of most urban diazinon and chlorpyrifos uses, attention shifted to insecticide replacements that commonly occur in urban surface waters at levels that may cause adverse impacts to aquatic life (e.g., carbaryl, malathion, and pyrethroids).⁷ Recognizing that the re-registration process offers a unique opportunity to prevent future water quality problems, agencies recently have begun to comment on pesticides for which there are little or no environmental data, but for which urban uses have the potential to cause exceedances of water quality criteria, aquatic toxicity, or violations of NPDES permits.⁸

In addition, agencies have sent more than 30 letters to U.S. EPA regarding 27 other decisions (see Appendix A, Table A-3 for details). The most important of these were:

- Procedural regulations for pesticide registration review
- Proposed rule: Data requirements for pesticides (“conventional chemicals”)
- Organophosphorous pesticide cumulative risk assessment
- Proposed rule: Endangered species act consultations on pesticide registrations
- U.S. EPA guidance on applications of pesticides to surface waters
- Proposed rule: Standards for pesticide containers and containment

⁷ These were selected based on a review of the replacement products: TDC Environmental (2003). *Insecticide Market Trends and Water Quality Implications*, report prepared for the San Francisco Estuary Project and the San Francisco Bay RWQCB, April.

⁸ Such pesticides are identified on the basis of the UP3 Project’s annual review of relevant research and monitoring data and information in U.S. EPA environmental risk assessments.

3.2 California Department of Pesticide Regulation

While most California water quality agency interaction with DPR has been informal and collaborative in nature, several specific requests have been made for DPR action:

- Re-evaluation requests. In 2001, the California Stormwater Quality Task Force (the predecessor of CASQA) requested that DPR re-evaluate urban uses of diazinon and chlorpyrifos. Recently, water quality agencies have discussed possible re-evaluations for pyrethroid insecticides and marine antifouling paints with DPR; both CASQA and Tri-TAC formally requested that DPR place all pyrethroids into re-evaluation.
- Registration request. In 2004, Tri-TAC asked DPR to register pesticide-impregnated clothing.
- Registration water quality assessments. Water quality agencies have asked DPR staff to conduct analyses of water quality impacts of several pesticide products being evaluated for registration. Some of these requests were made informally. These products and uses include copper-containing roofing material (2001), permethrin use in floor drains (2005), permethrin impregnated clothing (2005), and a variety of products proposed to be used in or that would be discharged to sewers or storm drains (informal, 2004 and 2005).

3.3 2006 Schedule

3.3.1 U.S. EPA

A schedule of anticipated upcoming U.S. EPA pesticide re-registration activities relevant to urban water quality is in Appendix A, Table A-1. This schedule is subject to change. U.S. EPA plans to complete review the registrations of most common urban pesticides by August 2006. Remaining pesticides (those without food uses) are planned for review by 2008. For most pesticides, this will be the first review since the pesticide was originally registered, which may have been decades ago.

The urban use pesticides that have been linked to potential water quality problems with anticipated public input opportunities in 2006 are:

- Risk assessments: cypermethrin, resmethrin, copper compounds, pentachlorophenol
- Re-registration decisions: cypermethrin, permethrin, resmethrin, malathion, copper compounds, pyrethrins, synergists (piperonyl butoxide and MGK-264), three types of wood preservatives (arsenic and chromium compounds, creosote, and pentachlorophenol).

These re-registrations are critically important to water quality because insecticides replacing urban uses of diazinon and chlorpyrifos—the pyrethroids—have been shown to cause toxicity to organisms living in the sediments of California urban creeks.⁹ Certain other pesticides used in urban areas also have significant potential to threaten NPDES permit compliance of water quality and wastewater and urban runoff agencies.¹⁰

After 2006, U.S. EPA will start its next round of review of pesticide registrations, which will include several pesticides of interest that were not subject to re-registration (e.g.,

⁹ Weston, D. P., R. W. Holmes, et al. (2005). "Aquatic Toxicity Due to Residential Use of Pyrethroid Insecticides," *Environ. Sci. Technol.*, ASAP Article. Web Release Date: October 19.

¹⁰ TDC Environmental (2005). *Pesticides in Urban Surface Water. Annual Research and Monitoring Update 2005*, prepared for the San Francisco Estuary Project, March.

bifenthrin, cyfluthrin, deltamethrin, and lambda-cyhalothrin). The schedule for these future reviews has not been set.

3.3.2 California Department of Pesticide Regulation

DPR's routine activities include:

- Annual renewal of all pesticide product registrations (usually in November or December)
- Announcements of pesticide products entering evaluation for registration (weekly)
- Pest Management Advisory Committee meetings (quarterly)
- Pesticide Registration and Evaluation Committee meetings (bimonthly)

No other urban water quality-related opportunities for public input into DPR regulatory actions are known at this time.

Other DPR-related activities could occur at any time. For example, DPR can decide to bring pesticides into re-evaluation at any time. While the public can request DPR re-evaluate pesticides, the decision itself (which determines the scope of the re-evaluation) has not historically been circulated for public comment prior to its finalization by DPR.

Under a Management Agency Agreement between DPR and the State Water Resources Control Board, DPR and the State Water Board indicated their intent to hold public meetings to discuss pesticide water quality regulatory issues, including urban issues. No such meetings have been held to date.

4.0 EVALUATION OF OUTCOMES

California water quality agencies have begun to change the way U.S. EPA and DPR conduct pesticide regulatory activities. These changes have been demonstrated in many different manners, as explained below. Changes in 2005 are significant in that they reflect a growing understanding of pesticide-related water quality issues by both pesticide and water quality agencies—and the increasing ability of pesticide and water quality agencies to communicate with each other. Increased communication and scientific and regulatory knowledge has given agencies the ability to work on specific, feasible actions that improve the way that water quality is addressed by pesticide regulatory agencies.

The ability to evaluate outcomes is limited at this time, because the types of processes that California water quality agencies have engaged in take years to complete—and the systemic changes desired will probably take many years to implement fully. Even interim feedback is delayed—U.S. EPA has not yet responded to most of the comments sent by water quality agencies because the regulatory processes are still underway.

4.1 U.S. EPA

Ongoing communications with California water quality agencies has made U.S. EPA Office of Pesticide Programs (OPP) generally more willing to consider and address water quality issues than they have been in years past. These changes can be directly linked to the efforts of California agencies. Water quality is not regularly raised by other commenters on U.S. EPA pesticides actions. Since 1999 no water quality agency that is not part of the California water quality agency effort has regularly participated in U.S. EPA pesticides regulatory processes.

4.1.1 U.S. EPA OPP Staff Are Aware of Urban Pesticides Water Quality Issues

California water quality agencies' more than 100 comment letters have reached a relatively large fraction of U.S. EPA OPP environmental risk assessors and risk managers. While there is substantial room for improvement in U.S. EPA risk assessment methods, increased general awareness of water quality concerns has been reflected in the tone and content of recent pesticide environmental risk assessments.

Recent research documenting pesticide-related toxicity in surface water sediments attributed to pyrethroids has highlighted urban surface water issues for U.S. EPA. This research showed that toxicity to sediment dwelling organisms was occurring in water bodies receiving urban runoff.¹¹ Researchers found that the toxicity was more severe and more widespread in urban areas than in agricultural areas. This finding—in conjunction with a set of compelling letters from California water quality agencies to U.S. EPA on the permethrin risk assessment—surprised U.S. EPA environmental risk assessors, who had assumed that risks from permethrin in urban runoff would be much lower than agricultural runoff risks.

4.1.2 The Quality of the Dialogue Between U.S. EPA and California Water Quality Agencies Has Significantly Improved

Most recent U.S. EPA responses have indicated that water quality-related comments are generally being treated seriously and thoughtfully. Nevertheless, significant opportunities for improvement in communications remain. For example, only recently has U.S. EPA OPP initiated contacts with California water quality agencies to clarify their comments or

¹¹ Weston, D. P., R. W. Holmes, et al. (2005). "Aquatic Toxicity Due to Residential Use of Pyrethroid Insecticides," *Environ. Sci. Technol.*, ASAP Article. Web Release Date: October 19.

to obtain additional information. While U.S. EPA's 2005 written responses to water quality-related comments have improved, the improvement is inconsistent (see Appendix B). This variation appears to reflect differences in familiarity with water quality issues among U.S. EPA OPP's chemical review managers. Because communication has primarily been in writing, it is no surprise that difficulties interpreting comments have generated U.S. EPA responses that sometimes appear irrelevant or inappropriate from the water quality agency perspective. Physical distance, OPP's propensity to abbreviate its public involvement process to avoid missing programmatic deadlines, and programmatic differences remain barriers to improving communication quality.

U.S. EPA Region 9 has worked with the UP3 Project to promote improved communications between U.S. EPA OPP and California water quality agencies. The U.S. EPA Region 9 Pesticides Office has facilitated many productive communications. These communications have usually involved DPR, which is helpful for both DPR and water quality agencies. For example, U.S. EPA Region 9:

- Set up teleconference meetings between California water quality agencies and U.S. EPA OPP.
- Arranged for U.S. EPA OPP staff to join selected UPC meetings by teleconference.
- Forwarded important water quality related information directly to appropriate U.S. EPA OPP staff.
- Placed U.S. EPA OPP staff in direct contact with key staff at California water quality agencies.
- Assisted California agencies with interpreting U.S. EPA communications.
- Helped California agencies learn how to provide constructive input to U.S. EPA on pesticides issues.
- Sought to have U.S. EPA OPP view water agencies as regulatory partners rather than adversaries.

The UP3 Project has provided meeting materials, technical briefings, and assisted with scheduling to ensure that California water quality agency interactions with U.S. EPA have positive, productive outcomes.

4.1.3 U.S. EPA Has Improved Environmental Risk Assessment Procedures

California water quality agency comments about U.S. EPA's environmental risk assessment procedures for pesticides have changed the way U.S. EPA conducts its risk assessments. The following significant improvements appear to be linked directly to California water quality agency comments:

- U.S. EPA has developed methods to estimate risks from pesticide discharges to municipal wastewater treatment facilities. Previously such discharges were assumed to be unable to reach surface waters. (Some recent risk assessments have omitted this analysis, suggesting that it still needs to be integrated into standard procedures.)
- U.S. EPA is willing to use all available scientific data, whether from manufacturers or the published literature. Previously risk assessments relied primarily or exclusively on manufacturer-supplied information.
- U.S. EPA uses available surface water monitoring data.

- U.S. EPA uses all aquatic toxicity data available, including data from the agency-wide ECOTOX environmental toxicity database. Previously U.S. EPA only allowed data from pesticide manufacturers to be used as the primary data source for pesticide risk assessments.
- To the extent information is available, U.S. EPA assesses the environmental risks from pesticide inert ingredients and looks at how formulations affect risk.
- U.S. EPA considers the environmental risks from pesticide degradates.
- To the extent information is available, U.S. EPA has committed to considering cumulative effects of pesticides. Some recent risk assessments have not included such analyses, suggesting that this procedural change has not been fully implemented.
- U.S. EPA identifies uncertainty in its environmental risk assessments.

These improvements increase the potential for U.S. EPA to identify water quality problems in its pesticide registration and re-registration processes. Since risk mitigation measures are only considered when problems are identified, these changes are crucial first steps for water quality protection and Clean Water Act compliance.

4.1.4 U.S. EPA Has Addressed a Few Urban Pesticide Uses of Concern for Water Quality

U.S. EPA has completed only a few of the pesticide re-registration processes in which California water quality agencies have participated. Therefore, this evaluation of the changes in pesticide use is necessarily incomplete. In evaluating regulatory outcomes, it is important to recognize that water quality is but one of many economic, social, and environmental factors that U.S. EPA and DPR must consider when making regulatory decisions. The extent that water quality agency comments contributed to U.S. EPA's decision generally cannot be determined specifically; however, in a few cases, U.S. EPA made specific changes in response to California water quality agency comments. These include:

- Chlorpyrifos. Most urban uses were terminated, but some potentially problematic uses continue (e.g., golf courses). Applications in storm drain manholes were specifically prohibited in response to California water quality agencies' requests.
- Diazinon. All urban uses were terminated (but cut flower and nursery uses could occur in urban areas). Use of diazinon trunk wraps in urban areas was specifically prohibited in response to California water quality agencies' requests.
- Lindane. U.S. EPA modified the national lindane water quality criteria and asked FDA to enact measures to reduce use of lindane pharmaceuticals (which are not regulated by U.S. EPA).
- Carbaryl. Pet care applications were terminated, apparently partly in response to California water quality agency questions about this use, which involved discharges to municipal wastewater treatment plants.

Appendix A, Table A-4 contains a more detailed summary of the most common urban uses of each pesticide, the urban use changes made in the re-registration process and the likely relevance of water quality agency comments in these changes.

While U.S. EPA has generally provided relatively limited risk mitigation to address water quality problems, future directions could change. Recent research findings on

pyrethroids and California water quality agency comments on permethrin create the potential that new risk mitigation strategies will be considered for pyrethroids.

4.1.5 U.S. EPA Has Begun To Improve Cooperation Between its Offices

In response to water quality agencies' requests for cooperation between U.S. EPA OPP and Office of Water, U.S. EPA has tried several different initiatives to address pesticides and water quality. The primary outcome of these initiatives has been a willingness to improve staff-level communications between the Office of Water and OPP. Office of Water staff have limited interactions with pesticides staff, but there is evidence that relationships are being initiated (e.g., Office of Water staff have provided models and data to pesticides staff and have participated in teleconference meetings between California water quality agencies and U.S. EPA OPP). While these developments are encouraging, they are only the first step on the road to addressing the many fundamental scientific and policy communications gaps that have been identified by California water quality agencies.

4.2 California Department of Pesticide Regulation

Relationships between California water quality agencies and DPR improved dramatically in 2005. These improvements can be attributed to:

- Appointment of a new DPR Director in late 2004 and outreach by CASQA and Tri-TAC to the new director.
- Appointment of a new DPR Deputy Director for Policy Coordination who has been actively engaged in water quality issues.
- Appointment of proactive DPR and water quality agency staff to important positions (DPR advisory committees, DPR-Water Board Management Agency Agreement coordinators).
- Regional and State Water Board adoption of several pesticide TMDLs.
- Coordinated efforts by DPR staff and the UP3 Project to improve communication among agencies.

The combination of new leadership direction, regulatory collaboration with the Water Boards on recent TMDLs, and proactive engagement of other water quality agencies (largely coordinated by the UP3 Project) has created new opportunities to achieve water quality agency goals. While changes at DPR have yet to be fully realized, California water quality agencies have reason to be optimistic that DPR is on the road to becoming a cooperative Cal-EPA partner for the Water Boards.

4.2.1 DPR Is Reconsidering Its Ability to Use its Regulatory Authority To Address Urban Water Quality Issues

In past years, DPR has been hesitant to use its regulatory authorities to address urban surface water quality problems. For example, in the 1990s, it declined to put diazinon and chlorpyrifos into re-evaluation.¹² As recently as 2004, it declined to register permethrin-impregnated clothing. However, in late 2005, it has publicly stated that it is considering the following regulatory actions to protect water quality:

¹² Although water quality agencies met with DPR many times between 1995 and 2001, no written request was made until 2001. This request was made at about the same time that U.S. EPA agreed with registrants to terminate most urban uses of diazinon and chlorpyrifos. Re-evaluation is DPR's regulatory mechanism to address environmental problems with pesticides that are already registered.

Improving Urban Pesticide Regulatory Activities to Protect Water Quality

- Re-evaluation of all pyrethroid products. In response to research findings of toxicity in urban and agricultural surface water sediments, DPR is considering bringing pyrethroids into re-evaluation. In re-evaluation, DPR can require manufacturers to complete various actions such as developing solutions to pesticide-related water quality problems, supplying product or active ingredient-related data, and completing monitoring to assess efficacy of proposed solutions to water quality problems.
- Re-evaluation of all biocidal marine antifouling coatings. Marine antifouling paints were identified as the source of a copper impairment in Shelter Island Yacht Basin. The State Water Board approved a TMDL that calls for aggressive copper reductions in the yacht basin over the next 17 years. This problem does not appear to be unique to the San Diego area. Because alternative biocides (e.g., irgarol, zinc pyrithione) are highly toxic to aquatic life, DPR is considering including all biocides (not just copper-based biocides) in the possible re-evaluation.
- Restructuring its pesticide regulatory process to prevent water quality problems. At the request of the San Francisco Bay Water Board (based on the recently adopted Bay Area Urban Creeks diazinon and pesticide-related toxicity TMDL), DPR is considering how it can modify its regulatory process to prevent future pesticide-related violations of water quality standards.

While the outcome of the above decisions is uncertain, the public acknowledgement of these actions gives water quality agencies reason to be optimistic that DPR's decisions will be beneficial to water quality.

4.2.2 DPR Has Improved Communication with California Water Quality Agencies

In the last few years, DPR has improved communication and cooperation with California water quality agencies in regard to urban pesticide issues. In 2005, DPR management and water quality agencies established multiple lines of productive communication:

- DPR integrated water quality agencies into its advisory committees. Water quality agency representatives have been appointed to the relevant DPR advisory committees and have actively engaged in committee processes. In 2005, the first water quality agency representative in the committee's history was named to the DPR's Pest Management Advisory Committee. A water quality agency representative was also appointed to a special DPR task force on Pest Management in the 21st Century. The State Water Board representative to the Pesticide Registration and Evaluation Committee was replaced in 2005 with a Water Board staff member who is more engaged in the Committee's activities.
- DPR expanded its participation in water quality-related meetings. DPR expanded its engagement in the UPC and other water quality meetings. For example, staff with expertise related to UPC meeting topics actively participated in UPC meetings, providing useful, relevant information to water quality agencies and first-hand perspective on water quality issues for DPR staff. DPR also participated in a statewide CASQA meeting on pesticides.
- DPR decided to continue facilitating interagency communication on marine antifouling coatings. After some discussion, DPR determined that it was appropriate for it to continue to manage the state's only forum for interagency coordinating group on the effects of marine antifouling coatings on water quality.

- DPR worked cooperatively with State and Regional Water Boards on TMDLs. Both DPR and the State and Regional Water Boards worked actively to develop improved communications within Cal-EPA's structure.

These changes appear to have successfully addressed some important information and communication gaps that existed for decades.

Significant challenges remain. For example, DPR's procedures do not afford any opportunity for water quality agencies to provide input into the details of DPR re-evaluation decisions, even though these decisions may be critical for water quality agencies to comply with the Clean Water Act.

Another challenge is that while DPR's pesticide registration process technically provides public input opportunities, the way it is structured virtually precludes meaningful input. DPR's public notices provide little information about products entering DPR's registration process.¹³ When a pesticide enters DPR's registration process, the public notice usually provides relatively limited information: the product name, manufacturer name, a simplified one-sentence description of the general type of use proposed for the product, the name of the registration action being considered, and the pesticide active ingredient.

When a pesticide product is proposed for registration, DPR's normal procedure does not involve making its assessment of the product's potential water quality impacts readily available. It is possible to obtain documents associated with DPR's registration water quality review (those that do not contain confidential business information) upon written request. The time required for the written request makes it difficult for an agency to make such requests regularly and makes it difficult for agencies to provide meaningful comments on proposed registrations within DPR's standard 30-day comment period.

Public notices do not explain how to provide comments to DPR. Informally, DPR has indicated that comments are only accepted in writing.

DPR's public involvement process is constrained by laws and regulations. For example, DPR must protect confidential business information, must carefully document its decisions, and it is required to process registration applications in a timely manner. Cooperation among agencies could be improved if DPR was able to provide a more transparent and straightforward public involvement process within these constraints.

4.2.3 DPR Continues To Experience Significant Resource Limitations

Most of DPR's programs that supported California water quality agency pesticide activities were cut in response to DPR budget cuts in the late 1990s and early 2000's. For example, DPR:

- Eliminated its contracts for water quality investigations. DPR still issues a few small contracts and conducts a few investigations of its own.
- Reduced its water quality monitoring activities. In-house staff conduct a few investigations a year, primarily in agricultural areas.
- Terminated its pest management alliance grant programs. These grant programs were DPR's primary method of developing and promoting less toxic pest control methods.

¹³ DPR registers every individual pesticide product separately. In contrast, U.S. EPA focuses on registering pesticide active ingredients; it regulates individual products primarily by reviewing and approving their labels.

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Eliminating these programs has left California water quality agencies without some previously valuable assistance for their efforts to address urban pesticide-related water quality problems.

In 2005, most of DPR's limited remaining surface water funding was directed to issues other than urban surface water quality. A notable exception was a contract with the University of California to compile information on non-residential urban pesticide use and to explore outreach strategies for non-residential pesticide users.¹⁴ Consultation with water quality agencies about monitoring and research project plans would maximize the opportunity for DPR to generate useful information with its limited resources.

DPR's resource limitations could restrict its ability to complete actions necessary to protect water quality. For example, DPR does not currently conduct environmental risk assessments or urban watershed modeling. These functions are necessary for predicting water quality problems from pesticides.

¹⁴ Wilen, C. Kreidich, N. et al. (2005). *Tracking Non-residential Pesticide Use in Urban Areas of California*. Prepared by the University of California IPM program for the California Department of Pesticide Regulation. June 10.

5.0 PROGRESS ON PREVIOUS RECOMMENDATIONS

The April 2003 and December 2004 review and evaluation of California water quality agency participation in pesticide regulatory activities included several recommendations, most of which generated follow-up actions. Below is a progress report on each recommendation (with the year and number of the previous recommendation identified).

Previous Recommendations 2003-1, 2004-1, and 2004-2: *Continue to provide U.S. EPA and DPR with information to prevent potential water quality problems associated with urban pesticide use. Continue to press for consistency in implementation of water quality and pesticide regulatory programs within U.S. EPA and California EPA.*

Action to date: California water quality agencies have continued to provide information to U.S. EPA. Water quality agencies increased their activity level in 2005. This increase appears to be a direct result of UP3 Project scientific and regulatory support.

Previous Recommendations 2003-2 and 2004-3: *Facilitate involvement of other California water quality agencies in Federal urban pesticide regulatory processes that may affect water quality.*

Action to date: The network of California water quality agencies that regularly provide information to U.S. EPA continues to grow. In 2005, the UP3 Project focused on strengthening urban runoff agency involvement through CASQA. The state wastewater agency organization Tri-TAC and the national wastewater agency organization the National Association of Clean Water Agencies (NACWA) have become involved. Further strengthening of the network should focus on increasing state and national organization engagement in pesticide/water quality issues and institutionalizing pesticide/water quality activities within these organizations. There is particularly a need to determine whether national coordination of urban runoff and water quality regulatory agencies is possible.

Previous Recommendation 2004-4: *Work with statewide and national organizations (e.g., CASQA, Tri-TAC, NACWA) to streamline comment preparation processes.*

Action to date: Through Tri-TAC, wastewater agencies have successfully developed methods for timely processing of letters to U.S. EPA and DPR by state and national wastewater agency organizations. CASQA is exploring ways to streamline its process.

Previous Recommendations 2003-3 and 2004-6: *Consider participating in public forums (such as national advisory committees and national conferences) to enhance nationwide understanding of managing urban pesticides to prevent surface water quality programs.*

Action to date: Action on this recommendation has been limited, but successful. For example, a presentation by a Los Angeles County Sanitation Districts staff member at a national Association of Metropolitan Sewerage Agencies (AMSA) conference generated a flurry of activity by AMSA leaders, U.S. EPA Office of Water managers, and the press. These interactions brought AMSA (now called NACWA) into the process of commenting on U.S. EPA pesticide regulatory actions. California's ongoing budget problems have continued to limit out of state travel, making participation in national forums nearly impossible for most state and municipal staff at the present time.

Previous Recommendations 2003-4 and 2004-7: *Identify practical methods to address the environmental effects of all ingredients in individual pesticide products as those products are registered. Initial steps include identifying available modeling tools and*

modeling information resources, determining what entities have appropriate expertise to address methodology gaps, and scoping out the work required to address the most critical methodology and information gaps.

Action to date: U.S. EPA has indicated that it agrees that such tools need to be developed—particularly methods to model runoff of pesticides from urban areas. The UP3 Project has identified U.S. EPA Office of Water modeling resources and examples of watershed modeling that are analogous to the modeling needed for urban pesticides. Continuing to facilitate the process of finding ways to fill these methodology gaps needs to be a priority for California water quality agencies.

Previous Recommendation 2004-5: Develop a stable funding mechanism to continue scientific and regulatory support for California water quality agency participation in U.S. EPA and California DPR regulatory activities affecting water quality.

Action to date: Currently, UP3 Project funding provides this technical support; however, UP3 Project funding ends in early 2007. The UP3 Project has made California water quality agencies aware of the need to identify funding to continue their pesticide-related activities after early 2007. In the past, California water quality agency participation in California and Federal pesticide regulatory processes has been limited in time periods when there was no or limited funding for technical support for the program.

Previous Recommendation 2004-8: Strengthen relationships with California DPR's regulatory programs. Water quality agencies need to explore how registration, re-evaluation, and other authorities work.

Action to date: This recommendation was fully implemented in 2005:

- Communication was improved. In 2005, the UP3 Project opened a dialogue between DPR's regulatory programs and California water quality agencies.
- Complete information on DPR registration reviews was obtained. The UP3 Project facilitated presentation of DPR's pesticide registration review process and other regulatory authorities to the UPC. The presentation specifically explained that DPR reviews aquatic toxicity data, but completes no water quality modeling or environmental risk assessment when pesticide products are registered. Two sets of wastewater agency comment letters¹⁵ prepared at the recommendation of the UP3 Project clarified DPR's registration processes and allowed water quality agencies to obtain and review the water quality related analysis performed by DPR when registering pesticide products.
- Appointments to DPR positions improve consideration of water quality. The Director of DPR appointed a water quality agency representative to the DPR Pest Management Advisory Committee. (The UP3 Project suggested that wastewater and stormwater agencies request this appointment.) A water quality agency representative was also appointed to a special Pest Management in the 21st Century task force established by the DPR Director. A new State Water Board representative was appointed to DPR's other advisory committee, the Pesticide Registration and Evaluation Committee (PREC). Both the Water Board and U.S. EPA Region 9 representatives on the PREC have begun to coordinate with water quality agencies, with the assistance of the UP3 Project. Both DPR and the State Water Board appointed new

¹⁵ One was on insecticide-impregnated clothing that DPR declined to register. The other was in regard to a pyrethroid product proposed for application in floor drains.

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Management Agency Agreement coordinators with unique backgrounds on urban pesticides and water quality. With the assistance of the UP3 Project, both coordinators are actively working with water quality agencies.

- DPR regulatory authorities clarified. With the assistance of the UP3 Project, California water quality agencies have established that re-evaluation is DPR's preferred regulatory tool for managing surface water quality problems with currently registered pesticide products.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Recent reports that pyrethroid insecticides are linked to widespread toxicity to sediment-dwelling organisms in Northern California urban creeks have increased the importance of active California water quality agency participation in California and Federal pesticide regulatory processes. Since California law precludes local regulation of pesticides, municipal urban runoff programs and wastewater agencies must rely on pesticide regulators to solve this problem. While pesticide regulators are moving to improve the way they address water quality, *strong action by water quality agencies is clearly necessary to resolve problems with pyrethroids and to achieve compliance with the Clean Water Act.*

6.1 Conclusions

Conclusion 1: The most cost-effective approach to protecting surface water from pesticide-related toxicity is to prevent pesticide uses that have significant potential to cause water quality impairment. The most significant opportunity to prevent problem pesticide uses is the U.S. EPA pesticide re-registration process; it is the only ongoing process that combines an evaluation of the water quality impacts of pesticides with the regulatory authority to terminate or modify any use that causes significant impacts. While DPR has the authority necessary to prevent water quality impacts, its current pesticide registration process does not include evaluation of these impacts.

Conclusion 2: California water quality agencies are the only government agencies pressing to change pesticide regulatory practices that have proven insufficient to ensure that pesticide use does not cause violations of the Federal Clean Water Act and California Porter-Cologne Water Quality Control Act. Although California's long history of pesticide-related water quality and NPDES permit compliance problems does not appear to be unique, water quality agencies from other states have not actively engaged in efforts to ensure that pesticide regulatory processes do not result in water quality problems.

Conclusion 3: DPR is moving toward exercising its authorities to protect urban surface water quality. DPR is considering bringing two groups of pesticide products associated with urban water quality problems into re-evaluation. DPR may restructure its processes to improve its ability to prevent water quality problems in the first place.

Conclusion 4: Information from California water quality agencies has caused U.S. EPA to improve its assessment of surface water quality impacts during pesticide registration. U.S. EPA staff have indicated that California water quality agency efforts are effective and are changing the way that U.S. EPA assesses the environmental risks of pesticides. Staff from U.S. EPA OPP, Office of Water, and Region 9 have stated that they believe that written comments, teleconference meetings, and other interactions have been valuable to achieving California water quality agency goals.

Conclusion 5: Although progress with California and U.S. EPA pesticide regulators provides reason for optimism, the ultimate outcomes of California water quality agency efforts remains uncertain. Changing California and Federal regulatory processes within existing law is likely to take years. True progress is reflected in an agency's final decisions. In 2005 (through November), neither U.S. EPA nor DPR completed any regulatory decisions on pesticides that are high priorities for urban surface water quality.

Conclusion 6: Significant communications gaps remain between California water quality agencies and California and Federal pesticide regulators. While communication has improved significantly (particularly at the state level), truly cooperative relationships do

not yet exist. Among the most common—and most readily addressed—communications problems are the differences in terminology and lack of familiarity among pesticide regulators of how pesticides used in urban areas reach surface water. Moreover, Federal pesticide regulators do not often have an appreciation for Federal Clean Water Act regulatory processes, regulatory requirements, and costs for non-compliance. At the state level, many regulatory decisions (e.g., pesticide registration, re-evaluation decisions) are not structured in a manner that functionally provides for meaningful input from water quality agencies. At both the state and Federal levels, communications are complicated by requirements that pesticide regulators protect data that are considered confidential business information—even though such data may be necessary for full evaluation of a pesticide product's water quality impacts.

Conclusion 7: The Urban Pesticides Committee is the nation's only agency and stakeholder group working to address pesticide-related water quality problems associated with the use of pesticides in urban areas. No other U.S. state or region has established a similar program.

6.2 Recommendations

Recommendation 1: Continue to provide U.S. EPA and DPR with information to prevent potential water quality problems associated with urban pesticide use and to press for consistency in implementation of water quality and pesticide regulatory programs within U.S. EPA and California EPA. U.S. EPA staff have recommended that water quality agencies continue to communicate information and recommendations to U.S. EPA and expand efforts to meet in person and via teleconference directly with U.S. EPA OPP management. Regular communication is important to ensure that U.S. EPA OPP staff (including chemical review managers) have an appreciation for water quality issues. Regular communication appears to be the most likely way to encourage U.S. EPA management to acknowledge and address the costly regulatory gaps created by uncoordinated implementation of Federal water quality and pesticide laws.

Recommendation 2: Continue to strengthen the network of water quality agencies working on urban pesticides issues. Priorities include streamlining comment preparation processes and involving national organizations. There is particularly a need to determine whether coordination with urban runoff and water quality regulatory agencies elsewhere in the U.S. is possible.

Recommendation 3: Develop a stable funding mechanism to continue scientific and regulatory support for California water quality agency participation in U.S. EPA and California DPR regulatory activities affecting water quality. Funding is also needed for interagency coordination and communication functions, such as those provided by the UPC and the UP3 Project web site.

Recommendation 4: Increase efforts to raise urban pesticide surface water quality issues at the national level. It is unlikely that California's experience with pesticide-related surface water quality problems in urban areas is unique. Water quality agency staff should increase efforts to participate in public forums (such as national advisory committees and national conferences) to enhance nationwide understanding of managing urban pesticides to prevent surface water quality problems. While budgets may limit travel, opportunities may exist for scholarships, U.S. EPA-funded travel, attending meetings in California, or participation by teleconference.

Recommendation 5: Continue efforts to determine possible approaches and next steps toward developing practical methods for U.S. EPA and DPR to address the environmental effects of all ingredients in individual pesticide products when those

products are registered or re-registered. Continuing to facilitate the process of finding ways to fill these methodology gaps needs to be a priority for California water quality agencies. Conceptual models of pesticide fate and transport in urban environments may be useful tools to facilitate dialogue between water quality and pesticide regulators.

Recommendation 6: *Actively seek to strengthen communication between California water quality agencies and California and U.S. EPA pesticide regulators.* Enhanced communication will increase pesticide regulator appreciation for and consideration of the scientific and regulatory issues around pesticides and water quality. Water quality agencies can facilitate communication by being responsive to requests for dialogue and by trying to provide information and background using terminology that is accessible.

APPENDIX A. U.S. EPA PESTICIDE REGULATORY ACTIVITY

Tables in this appendix:

- A-1. List of U.S. EPA Pesticide Re-Registration Comment Letters by California Water Quality Agencies
- A-2. List of U.S. EPA Pesticide Regulatory Activity Comment Letters by California Water Quality Agencies
- A-3. U.S. EPA Pesticide Re-Registration Schedule
- A-4. Changes in Pesticide Uses of Urban Water Quality Concern, 1999-2005

Table A-1. U.S. EPA Pesticide Re-Registration Schedule

Pesticides of Urban Surface Water Quality Interest

Pesticide	Preliminary Risk Assessment	Revised Risk Assessment	Registration Eligibility Decision*	Notes
Atrazine				EPA attempted to integrate water & pesticide regulatory actions
Carbaryl				
<i>Copper</i>				
Copper compounds	Scheduled 11/05		Planned by 5/06	Copper-containing pesticides are being regrouped
Copper sulfate	Scheduled 11/05		Planned by 5/06	
Copper & oxides			Planned by 5/06	
Copper salts			Planned by 6/07	
Dicamba	Scheduled 11/05		Planned by 5/06	
p-Dichlorobenzene			Planned for 3/08	Possibly important for POTWs
Lindane				
<i>Organophosphates</i>				
Diazinon				
Chlorpyrifos				
Malathion			Planned by 12/05	
MGK-264			Planned by 6/06	Synergist for pyrethrins & pyrethroids
Metam Sodium			Planned by 12/05	Part of fumigants cluster risk assessment (human health only)
<i>Phenoxy herbicides</i>				
2,4-D				
2,4-DB		Skipped		
2,4-DP			Planned by 9/07	
MCPA		Skipped		
MCPP			Planned by 9/07	
Piperonyl Butoxide			Planned by 6/06	Synergist for pyrethrins & pyrethroids
Pyrethrins			Planned by 6/06	
<i>Pyrethroids**</i>				
Allethrin			Planned by 3/07	
Cypermethrin	Scheduled 11/05		Planned by 5/06	
Permethrin			Planned by 6/06	
Resmethrin	Scheduled 11/05		Planned by 5/06	
Sumithrin			Planned for 9/08	
Tetramethrin			Planned for 9/08	
Tributyltin			?	No longer on EPA workplan for FY 2005-FY 2008
<i>Wood Preservatives</i>				
As/Cr Compounds			Planned by 6/06	Arsenic and chromium-containing wood preservatives like CCA
Creosote			Planned by 6/06	
Pentachlorophenol	Scheduled 11/05		Planned by 6/06	Plan to re-release preliminary risk assessment
Zinc Pyrithione		Plan to skip	Planned by 9/04	Marine antifouling paint use of interest
<i>Antimicrobials</i>				
PHMB		Plan to skip	Planned by 9/04	
Pine Oil		Plan to skip	Planned by 9/04	
Phenol		Plan to skip	Planned by 9/04	
Halohydrantoin		Plan to skip	Planned by 9/04	

Other Priority items:

U.S. EPA Pesticide re-registration rulemaking to define procedures for future 15-year reviews (draft regulations issued 7/05)

Comparative Assessment for synthetic pyrethroids (was expected 4/04)

Of potential urban interest: Endothal (risk assessment was released mid-2005); simazine (risk assessment 07/05); Inorganic chlorates (risk assessment 10/05)

Items in italics are past scheduled release date but have not been released.

"Plan to skip" means that U.S. EPA plans to omit this public input step and move straight to the RED or IRED.

*For those that are part of a cumulative group, this is an Interim Registration Eligibility Decision that will be finalized later

**Scheduled for tolerance review only (no environmental risk assessment): bifenthrin, cyfluthrin, esfenvalerate, imidacloprid, lambda-cyhalothrin, tralomethrin

Note: Most recent U.S. EPA schedule is for July-December 2005; a new schedule is anticipated in early 2006.

Table A-2. U.S. EPA Pesticide Re-Registration Comment Letters by California Water Quality Agencies
Activities of Urban Surface Water Quality Interest

Pesticide	Preliminary Risk Assessment	Revised Risk Assessment	Registration Eligibility Decision	Notes
Atrazine	--	SFBRWQCB	SFBRWQCB	Revised IRED and water quality criteria: SFBRWQCB, CASQA, LACSD, AMSA
Carbaryl	SWQTF, SFBRWQCB	CASQA, SFBRWQCB, LACSD	SFBRWQCB, CASQA, LACSD	RED complete
Lindane	LACSD	SFBRWQCB, LACSD	SFBRWQCB, LACSD	RED complete
<i>Organophosphates</i> Diazinon	SWQTF, ACCWP, CCCSD	SWQTF, SFBRWQCB, CVRWQCB, SWRCB, SFEI	SFBRWQCB, BASMAA, CCSF	IRED revised 5/04, but no public comment period was noticed
Chlorpyrifos	SWQTF, CCSF, SFBRWQCB, CCCSD	SWQTF	SWQTF, SFBRWQCB	IRED process completed. Also commented on FR Notice changing manufacturer agreement: SWQTF, SFBRWQCB, Tri-TAC
Malathion	None	SFBRWQCB, SWQTF		Re-revised risk assessment was issued: SFBRWQCB, CASQA, LACSD
MGK-264	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, CASQA, Tri-TAC, LACSD		
Metam Sodium	SFBRWQCB, CASQA, LACSD	SFBRWQCB, CASQA, LACSD		Re-revised human health risk assessment: LACSD
<i>Phenoxy herbicides</i> 2,4-D	SFBRWQCB, CCSF	SFBRWQCB, CASQA, CCSF	None	RED complete
2,4-DB	SFBRWQCB	Skipped	None	RED complete
MCPA	SFBRWQCB	Skipped	None	RED complete
Piperonyl Butoxide	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, CASQA, Tri-TAC, LACSD		
Pyrethrins	SFBRWQCB, CASQA, Tri-TAC, LACSD	SFBRWQCB, CASQA, Tri-TAC, LACSD		
<i>Pyrethroids</i> Permethrin	SFBRWQCB, CASQA, CCSF, Tri-TAC, LACSD, NACWA			
<i>Wood Preservatives</i> As/Cr Compounds	SFBRWQCB, CCSF			
Creosote	SFBRWQCB, CCSF, Tri-TAC			
Pentachlorophenol	SFBRWQCB, CCSF			Separate risk assessment on dioxins and HCB in penta: SFBRWQCB, CCSF
Zinc Pyrithione	SFBRWQCB	EPA to skip		
<i>Antimicrobials</i> PHMB	SFBRWQCB, CASQA, LACSD, CCSF	EPA to skip		RED supposedly signed in 2004, but never released to public
Pine Oil	SFBRWQCB, LACSD	EPA to skip		RED supposedly signed in 2004, but never released to public
Phenol	SFBRWQCB, LACSD	EPA to skip		RED supposedly signed in 2004, but never released to public
Halohydrantoin	SFBRWQCB, LACSD	EPA to skip		RED supposedly signed in 2004, but never released to public

Table A-3. U.S. EPA Pesticide Regulatory Activity Comment Letters by California Water Quality Agencies
Activities of Urban Surface Water Quality Interest

Pesticide Regulatory Activity	Who Commented
Cumulative risk assessment for organophosphorous pesticides	SWQTF
OPP Strategic Plan, 2002	SFBRWQCB
Methodology for lower toxicity chemicals (risk assessments)	SFBRWQCB
Endangered species consent decree	SFBRWQCB
ANPRM: Endangered species act consultations	SFBRWQCB
Proposed rule: Endangered species act consultations	SFBRWQCB
Interim statement & guidance: application of pesticides to waters of the U.S.	SFBRWQCB, SWRCB, CASQA
S. 1664, Pesticide registration improvement act of 2003	CASQA
Proposed rule: Standards for pesticide containers & containment	LACSD
Globally Harmonized System for Pesticide Hazard Classification and Labeling	CCSF
Rodenticides: Revised Risk Assessment for Rodenticides Cluster	CCSF
Registration of Antimicrobial Products Containing New Active Ingredients	LACSD
Procedural Regulations for Registration Review	SFBRWQCB, CASQA, LACSD, Tri-TAC, CCSF
Data Requirements for Conventional Chemicals	SFBRWQCB, CASQA, LACSD, CCSF, LACSD, Tri-TAC, San Jose, NACWA

Table A-4. Changes in Pesticide Uses of Urban Water Quality Concern, 1999-2005

Pesticide	Most Common Urban Uses	Urban Use Changes	Assessment of Relationship of Water Quality Agency Comments to Urban Use Changes
<i>Atrazine</i>	Lawn	Reduced application rate	Comments were related to approach to decision, not to specific uses
<i>Carbaryl</i>	Lawn, garden, pets	Pet applications terminated. Residential lawn applications temporarily limited, but may be reauthorized.	Water quality likely a factor in pet care use termination, but does not seem to be a factor in the ongoing evaluation of lawn uses.
<i>Chlorpyrifos</i>	Lawn, garden, around buildings, manholes	Most urban uses terminated, but some potentially problematic remain. Applications in storm drain manholes was prohibited	Water quality was probably not a factor in U.S. EPA's decision.
<i>2,4-D</i>	Lawns	Application rates will be reduced.	Comments were not directly related to this change.
<i>2,4-DB</i>	Open land	No changes that would affect water.	
<i>Diazinon</i>	Lawn, garden, around buildings	All urban uses terminated. Cut flower and nursery uses could occur in urban areas.	Water quality was probably a minor factor in U.S. EPA's decision. As requested, U.S. EPA added label language to clarify that diazinon trunk wraps should not be used in urban areas. Requested evaluations of nurseries and cut flowers uses were rejected.
<i>Lindane</i>	Lice and scabies treatments	EPA asked FDA to enact measures to reduce use and modified national lindane water quality criteria.	Data provided by water quality agencies were critical to the U.S. EPA decision. Water quality agency comments were likely a major factor in the decision to address pharmaceuticals that are not regulated by U.S. EPA and the decision to modify the lindane water quality criteria.
<i>MCPA</i>	Lawns and rights of way	Application rates will be reduced.	Comments were not directly related to this change.

Source: TDC Environmental evaluation of U.S. EPA Reregistration Eligibility Decisions.

APPENDIX B. ANALYSIS OF U.S. EPA RESPONSES TO CALIFORNIA WATER QUALITY AGENCIES

Tables in this appendix:

- B-1. 2,4-D Preliminary Risk Assessment Comment Summary—Comments from California Water Quality Agencies
- B-2. 2,4-D Revised Risk Assessment Comment Summary—Comments from California Water Quality Agencies
- B-3. 2,4-DB and 2,4-DB DMAS Preliminary Risk Assessment Comment Summary—Comments from California Water Quality Agencies
- B-4. MGK-264 Preliminary Risk Assessment Comment Summary—Comments from California Water Quality Agencies
- B-5. Piperonyl Butoxide Preliminary Risk Assessment Comment Summary—Comments from California Water Quality Agencies
- B-6. Pyrethrins Preliminary Risk Assessment Comment Summary—Comments from California Water Quality Agencies

These tables are intended to provide the reader with brief summaries of comments and responses. Readers interested in the details of a comment or response should consult the original water quality agency letters and U.S. EPA response documents, which are available in U.S. EPA's electronic dockets (go to www.regulations.gov and search on the pesticide active ingredient name). The "U.S. EPA Response" column contains verbatim excerpts from U.S. EPA response documents. These excerpts were occasionally summarized or edited to clarify content but were not edited for style.

**Table B-1. 2,4-D Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>1. Modeling of urban runoff is needed. (Water Board, SF Environment)</p>	<p>Agree that urban concentrations can be higher than agricultural concentrations, but believe that their approach is protective because modeled estimated environmental concentrations exceed maximum monitoring data concentrations.</p> <p>Argue that urban modeling involves complex processes and therefore that simple modeling tools cannot be used. State that “efforts are underway to develop new tools and techniques for a variety of exposure pathways.”</p> <p>Argue that there is very little usage information for 2,4-D in urban areas “on a national scale”.</p> <p>Turf usage is a surrogate for urban areas.</p> <p>Give us any monitoring data you have, we’ll use it.</p>	<p>Highest modeled concentrations only slightly exceed highest monitoring data concentrations (less than 10% difference), since monitoring was not designed to measure highest 2,4-D concentrations, there is a good chance that reliance on agricultural and turf modeling alone is not protective. Highest monitoring data were from agricultural areas.</p> <p>Unclear why no modeling for urban areas is better than the simple modeling methods available. After all, the purpose is “screening level” modeling, as they note elsewhere (see comment #9).</p> <p>Previous responses have cited a lack of usage data “on a watershed scale” as a reason not to try to model urban use.</p>
<p>2. Degradation rates used in modeling are not conservative. (Water Board, SF Environment)</p>	<p>Modeled concentrations exceed concentrations found in available monitoring data, so it doesn’t matter.</p> <p>We used the best available data. There is no data that shows that 2,4-D esters persist in surface waters (except 2,4-D BEE in aquatic sediments).</p>	<p>There is no data to support the quick degradation assumption used as the basis for the decision to ignore chronic (4-day) exposures of esters to aquatic species. No consideration of Gan et al. paper showing half lives are 20 times longer in soil under trees than on turf.</p>
<p>3. Aquatic toxicity data gaps must be filled. (Water Board, SF Environment)</p>	<p>Agreed. U.S. EPA OPP’s Environmental Fate & Effects Division (EFED) has asked for more data. ECOTOX will be searched if internal procedures for such searches are worked out before this risk assessment is completed.</p>	<p>U.S. EPA plans to make data requests at the end of the re-registration process (not earlier).</p>

**Table B-1. 2,4-D Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
<p>4. Dioxins in 2,4-D contribute to dioxins impairment of San Francisco Bay. (Water Board) Human and environmental risks from dioxins in 2,4-D need to be assessed. (SF Environment)</p>	<p>EFED has completed a preliminary analysis of the potential for risk to dioxin resulting from use of 2,4-D on March 25, 2004. The preliminary analysis has been forwarded to U.S. EPA OPP's Special Review & Reregistration Division (SRRD).</p> <p>The dietary risk was addressed in 1992. An analysis of the dioxin levels in products and potential dioxin exposures indicated that [human] dioxin risks were not of concern. Registrants have indicated that 2,4-D manufacturing has been refined to minimize the likelihood that dioxin will be formed.</p> <p>This issue will be further addressed in the reregistration eligibility decision.</p>	<p>The EFED dioxins analysis is not public at this time.</p> <p>The human health assessment is not public. It did not use the most current human health risk information for dioxins, which is in the U.S. EPA "Dioxins Reassessment". That work found that dioxins have substantially higher human toxicity than was previously believed.</p> <p>Both analyses are being reviewed for confidential business information issues (dioxins are technically an "inert" ingredient subject to confidential business information [CBI] restrictions).</p>
<p>5. Risk assessment should evaluate risks of 2,4-D products and 2,4-D degradates. (Water Board, SF Environment)</p>	<p>Based the assumption that degradates were not of any importance for the environmental risk assessment on the human health team's determination that none of the degradates of 2,4-D were of toxicological concern. No data were identified on environmental toxicity of degradates.</p> <p>EFED used what data are available on product formulations in the risk assessment.</p> <p>EPA determined that degradates were not of importance for human health risk.</p>	<p>Human toxicity and aquatic toxicity may have completely different mechanisms and endpoints. There is no scientific basis to rely on a human-based determination for an environmental risk assessment. If U.S. EPA cannot present the risks from each degradate, it says its standard assumption that any substance formed by the breakdown of a pesticide is as toxic as its parent compound.</p>

**Table B-1. 2,4-D Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
<p>6. Cumulative ecological risk assessment for phenoxy herbicides is needed. (Water Board); EPA failed to assess adequately combined risks of 2,4-D and common co-active ingredients. (SF Environment)</p>	<p>It is currently Agency procedure that risk assessments are conducted on a single active ingredient.</p> <p>Although the various phenoxy herbicides have similar structural components and overlapping uses, EPA has no data indicating that the phenoxy herbicides have a common mode of [human] toxic action. No procedures for cumulative ecological risk assessments exist.</p> <p>These ingredients are indeed commonly applied together at cumulative application rates higher than rates for 2,4-D alone. In the responses, EPA did a fairly detailed analysis of product active ingredient content and applications rates, showing that phenoxy acid application rates in total are about twice the rates for 2,4-D alone.</p>	<p>The next set of comments should cite the staff analysis showing the application rate. There is no data to show that no cumulative effects exist, therefore this approach is not protective.</p>
<p>7. Water quality criteria are needed. (Water Board)</p>	<p>Water quality criteria development is not our job. Water quality criteria are not needed to determine compliance with FIFRA.</p>	<p>The U.S. EPA Office of Water (OW) develops water quality criteria. There are no criteria for most pesticides. If values developed with OW water quality criteria development methods were used by OPP to assess FIFRA compliance, most pesticide-related Clean Water Act compliance problems would probably be avoided.</p>
<p>8. U.S. EPA Offices should coordinate efforts to protect water quality. (Water Board)</p>	<p>EFED routinely interacts and works with other programs within the Agency on issues related to FIFRA and FQPA.</p>	

**Table B-1. 2,4-D Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
9. Use of registered pesticides has impaired numerous water bodies. (Water Board)	EFED has conducted a screening level risk assessment on a national scale which is not intended to evaluate potential impairment of individual water bodies. The purpose of the screening level risk assessment is to evaluate overall risk from use and focus resources on refinements if necessary. No water bodies in California are listed as impaired due to 2,4-D.	Implies that the purpose of the environmental risk assessment is to prevent widespread impairment, not to protect individual water bodies.
10. Weed & Feed products are problematic. (SF Environment)	This comment would be addressed through label changes. Labeling changes will be considered as part of the reregistration of 2,4-D, and will be addressed in the final reregistration decision (RED) document.	

**Table B-2. 2,4-D Revised Risk Assessments Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response*	Notes
<p>1. Aquatic toxicity data gaps must be filled. (Water Board)</p>	<p>U.S. EPA agrees and has asked for additional data from the registrant. U.S. EPA has committed to conducting ECOTOX literature searches as part of the risk assessment process. Development of the guidance for conducting these searches and incorporating them into the risk assessment process is ongoing. Clearly, future revisions to this risk assessment will incorporate ECOTOX data depending on the timing of revisions relative to the formalization of the ECOTOX data search into U.S. EPA's risk assessment process.</p> <p>Additional data are being requested to address the persistence of 2,4-D BEE in sediment as well as the persistence of 2,4-D BEE ester in acidic aquatic environments. The ECOTOX database will be used to explore additional toxicity data. Decisions on when and how to incorporate other toxicity data will be made in accordance with U.S. EPA guidance.</p>	<p>Data request has no timeline. There is no schedule for follow-up action with such data requests. It is possible that requested data will not be used until the next round of registration review (which could be a decade or more away).</p>
<p>2. Modeling of urban runoff is needed. Monitoring data show higher concentrations in urban areas than in agricultural areas. (Water Board, SF Environment)</p>	<p>U.S. EPA agrees that the lack of a model specific to urban runoff processes to predict urban exposures adds uncertainty to the risk assessment. U.S. EPA also believes that inclusion of turf scenarios, while not specific to urban uses, does provide surrogate data for urban exposures.</p> <p>Analysis of the National Water Quality Assessment Program (NAWQA) surface water data indicate that the highest concentration of 2,4-D detected in urban streams sampled by NAWQA is an estimated concentration of 5.53 µg/l while the range of estimated environmental concentrations (EECs) using PRZM/EXAMS [U.S. EPA OPP agricultural waster quality models] was between 62.8 µg/l for use on apples to 7.6 µg/l for use on spring wheat. For the modeled turf scenarios the predicted EECs were 24.5 µg/l for Florida and 8.1 µg/l for Pennsylvania. These predicted EECs are all higher than those detected by NAWQA in both urban and agricultural streams. Regardless, using the maximum predicted EEC in the risk estimation suggests risk to endangered aquatic vascular plants from pasture and apple crop uses.</p>	<p>NAWQA monitoring was not designed to evaluate maximum 2,4-D concentrations. It is not appropriate to assume urban concentrations do not exceed levels found in these data.</p>

*These are excerpts of the key points from U.S. EPA responses.

**Table B-2. 2,4-D Revised Risk Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
3. Monitoring is U.S. EPA's responsibility. (Water Board)	Response was about conservativeness of (agricultural) water quality model inputs.	Response was completely unrelated to the comment.
4. Aquatic and human toxicity of pesticides and their degradates may differ substantially. (Water Board)	U.S. EPA's risk assessment clearly indicates that U.S. EPA relied on its human health hazard evaluation of environmental fate degradates to inform the decision whether to include degradates in the ecological risk assessment. The U.S. EPA Metabolite Assessment Review Committee (MARC) determined that none of the degradates of 2,4-D were of toxicological concern. This fact, coupled with a lack of data on the ecotoxicology of the environmental fate degradates and the low level of [degradates] formation in the studies reviewed led U.S. EPA to conclude that inclusion was not necessary at this time. U.S. EPA evaluated the effect of formulated product when the toxicity of the formulated product was greater than the toxicity of the technical forms of 2,4-D acid, amine salts or 2,4-D esters. In particular, the assessment of potential risk to non-target terrestrial plants did incorporate formulated product data. Finally, it is currently Agency procedure that risk assessments are conducted on a single active ingredient and [U.S. EPA] does not include mixtures and inerts in these assessments except where formulated toxicity data are available and only for a limited set of exposure pathways.	There is no scientific basis for an extrapolation from humans to aquatic organisms.

**Table B-2. 2,4-D Revised Risk Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
<p>5. Public involvement needed on U.S. EPA's analysis of risks from dioxins in 2,4-D. (Water Board, SF Environment)</p>	<p>U.S. EPA completed a preliminary analysis of the potential for dioxins risk resulting from use of 2,4-D on March 25,2004. [It was placed in the public docket when the RED was released in August 2005.] The dioxin assessment strategy was to evaluate dioxin runoff into the standard farm pond and direct application to surface waters. The assessment used reported concentrations of dioxins in 2,4-D and 2,4-D ethylehexyl ester. That risk assessment finds:</p> <ul style="list-style-type: none"> • Water column dioxins concentrations (TEQ), from exposure models of agricultural runoff and direct water applications were similar to ambient concentrations (0.0056±0.0079 pg TEQ/L [5.6×10^{-9} µg/l]) and concentrations in sediment (3.91 ng TEQ/Kg). • Although exposure modeling of dioxins from 2,4-D use could theoretically account for reported ambient sediment and water concentrations of dioxins, it is improbable that 2,4-D use alone is the sole source of measured dioxins loading in the environment. • Long-term use of 2,4-D for control of aquatic vegetation may lead to cumulative dioxins concentrations greater than reported in ambient sediment and water environments. <p>Water quality criteria for dioxins (TEQ) are 5.0×10^{-9} µg/l (for consumption of water and organisms) and 5.1×10^{-9} µg/l (for consumption of organisms only). The risk assessment predicts exceedances of these criteria, particularly for applications directly to surface waters. These exceedances are not described as a concern. No comparisons to water quality criteria are provided.</p> <p>To confirm that the changes to the manufacturing processes since 1987 have resulted in lower concentrations of dioxin congeners in technical 2,4-D products, U.S. EPA is requiring that five recent batches of all technical products be analyzed for dioxins using current state-of-the art validated analytical methods.</p>	<p>No public comment opportunity was provided.</p> <p>Only the ecological risk assessment was provided (nothing on human health). Human health is the primary basis for water quality criteria.</p> <p>Referenced "ambient concentrations" are about equal to water quality criteria. They are based on data assembled by U.S. EPA for the dioxins reassessment in 1994.</p> <p>Product dioxins data are outdated (1987) and based on analytical methods incapable of measuring what we now know to be environmentally relevant dioxins concentrations.</p>

**Table B-2. 2,4-D Revised Risk Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
6. Ecological risk assessment is needed for all ingredients in 2,4-D products, including co-active ingredients. (Water Board, SF Environment)	Currently, U.S. EPA does not have a methodology for conducting cumulative ecological risk assessments. A decision whether to conduct cumulative risk assessment for phenoxy herbicides is the responsibility of SRRD [a division of U.S. EPA's Office of Pesticide Programs], however the cumulative risk assessments currently being conducted are for human health only as mandated by the Food Quality Protection Act (FQPA).	
7. U.S. EPA is responsible for both pesticide reregistration and water quality criteria. Cooperation between U.S. EPA offices is essential (Water Board)	U.S. EPA appreciates the concern of the CRWQCB regarding the development of water quality criteria and coordination amongst its Offices. However, the purpose of U.S. EPA's risk assessment is to provide a screening level assessment of the potential for risk to aquatic and terrestrial organisms on a national scale in accordance with FIFRA. The development of water quality criteria is outside the statutory authority of EFED [a division of U.S. EPA's Office of Pesticide Programs (OPP)] and OPP. However, EFED does, and will continue, to consult with the Office of Water and other relevant parts of U.S. EPA on matters relating to pesticides including the development of water quality criteria.	
8. Applications when rain is forecasted should be prohibited (Water Board, CASQA, SF Environment)	No response. U.S. EPA did not add any rain-related requirements to 2,4-D labels.	This non-response is particularly surprising, given the specific nature of the comment and the fact it was made by multiple agencies.
9. Proposed label changes are needed to protect water quality (Water Board)	No response. U.S. EPA adopted the proposed changes.	

**Table B-2. 2,4-D Revised Risk Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
<p>10. Pesticides should not be formulated with fertilizers (Water Board, CASQA, SF Environment)</p>	<p>U.S. EPA is committed to the use of IPM. On occasion, weed pressures will require the use of herbicides. Although U.S. EPA promotes the use of spot treatments to control individual weeds, U.S. EPA is aware that for a variety of reasons, including time and ease of use, homeowners will choose to make broadcast applications of a product that contains both fertilizer and herbicide. Per product labels, the use of these weed and feed formulations is limited to two applications in a year.</p> <p>Regarding the migration of weed and feed products into water bodies, U.S. EPA is aware that when using granular product especially, it is common to have granules remain on driveways and sidewalks following application, and those granules can be washed into wastewater streams and other water bodies by rain. In the reregistration process, U.S. EPA reviewed monitoring data from water bodies across the country, and found that 2,4-D concentrations are below U.S. EPA’s level of concern. Nonetheless, U.S. EPA is working with consumer product registrants to revise labels to highlight the importance of sweeping granules from surfaces such as driveways and sidewalks, with the goal of minimizing the off-site movement of fertilizer and pesticide.</p> <p>Regarding the comment that consumers are unaware that weed and feed products contain pesticide(s), U.S. EPA has reviewed a subset of the weed and feed labels available in consumer outlets, and has found that the labels reviewed make it clear that the product is intended to kill weeds.</p> <p>U.S. EPA acknowledges that the risk reduction options proposed in Phase 5 of the reregistration process, and the mitigation steps taken in Phase 6, reduce but do not eliminate the identified ecological risks. Some ecological risks are of concern on some sites for some species. U.S. EPA’s characterization of its assessment of ecological risk is provided in the RED. The mitigation measures of (1) reducing maximum application rates, and (2) specifying a required spray droplet size of “Medium to Coarse” or coarser (i.e., prohibiting “fine” sprays) are expected to lessen, but not eliminate, the risk of 2,4-D to wildlife and non-target plants.</p>	

**Table B-3. 2,4-DB and 2,4-DB DMAS Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
1. Cumulative ecological risk assessment for phenoxy herbicides is needed (Water Board)	At this time the Agency has determined that 2,4-DB and 2,4-DB-DMAS do not have a common mode of action with other phenoxy herbicides and, therefore, a cumulative assessment was not performed.	Determination was for human health; comment was about ecological risks.
2. Water quality criteria are needed (Water Board)	This comment has already been sent to the Office of Water and the Agency continues to coordinate on developing water quality criteria.	

Note: These responses were in the RED.

**Table B-4. MGK-264 Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
1. Risk assessment should evaluate synergistic effects (Water Board, CASQA)	<p>The synergistic effect observed when MGK-264 and pyrethrins are applied together does not operate in higher organisms such as mammals, which have more sophisticated detoxification enzyme systems than insects have. Thus, synergism is not a concern in humans.</p> <p>In general, the U.S. EPA OPP Health Effects Division (HED) conducts such assessments only in cases where a common mechanism of toxicity has been identified for two or more pesticide active ingredients. At this time, HED has no information indicating that MGK-264 has a common mechanism of toxicity with any other chemical substances.</p>	Two separate responses to the same comment. Comments were about aquatic life; responses were about human health.
2. Risk assessment should include urban runoff modeling. (CASQA, Water Board)	EPA/OPP does not have a peer-reviewed model for estimation of water impacts from urban use of pesticides. Adoption of the models suggested by the commenters (HSPF and SWMM) would require formal review by the Science Advisory Panel. These considerations aside, the monitoring data that was discussed in EPA's assessment, none of which detected any MGK-264, indicates that the modeling results, which predict detectable residues up to 20% of the solubility limit, are protective of human health.	<p>They appear to be using the SAP review requirement as an excuse.</p> <p>Comment is about aquatic life; response is about human health.</p>
3. Mosquito abatement use modeling underestimates risks (Water Board)	As the mosquito abatement use pattern has been removed from the Master Label, this comment is moot.	Response is based on new information provided by manufacturer in its comments to EPA.
4. Aquatic toxicity data gaps preclude complete risk assessment (Water Board)	This comment is not relevant to the drinking water assessment. ECOTOX database searches are used for non-target plant and animal toxicity data, not human data.	Comment is about aquatic life; response is about human health.

**Table B-4. MGK-264 Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
5. Water quality criteria are needed for MGK-264. (Water Board)	OPP will consult with the Office of Water on this issue should it become clear that toxicologically significant concentrations of MGK-264 will be found in waterways.	Risk assessment found acute risks to freshwater fish and invertebrates and assumes similar acute risks for saltwater organisms (no toxicity data for saltwater organisms).
6. MGK-264 is used indoors and in products like pet shampoos that are discharged to sewers. Sewer discharges should be considered in risk assessment. (LACSD, Tri-TAC)	<p>EPA/OPP does not have a peer-reviewed model for estimation of water impacts from urban use of pesticides. Adoption of the models suggested by the commenters (HSPF and SWMM) would require formal review by the Science Advisory Panel. These considerations aside, the monitoring data that was discussed in EPA’s assessment, none of which detected any MGK-264, indicates that the modeling results, which predict detectable residues up to 20% of the solubility limit, are protective of human health.</p> <p>This issue [bioaccumulation] has not been explicitly considered. However, not all possible degradation mechanisms have been considered. EPA has no information on aerobic or anaerobic aquatic metabolism, indirect photolysis, or degradation by free radicals. Thus, despite a relatively high K_{ow}, it is not clear that MGK-264 will persist long enough to bioaccumulate as the commenter suggests.</p>	<p>Comment is about aquatic life; response is about human health.</p> <p>The first response refers to urban runoff models suggested by other commenters (completely unrelated to this comment). They apparently aren’t aware that EPA did sewer discharge modeling for permethrin.</p> <p>EPA confused a reference to bioaccumulation in receiving waters with “bioaccumulation in sewage treatment plants” (which is not at issue). To the extent it actually addresses the comment, the response is based on conjecture, not science.</p>
7. Please coordinate with Office of Water on review of MGK-264. (Water Board)	No response.	

**Table B-5. Piperonyl Butoxide (PBO) Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
1. Risk assessment should evaluate synergistic effects (Water Board, CASQA)	The synergistic effect observed when piperonyl butoxide (PBO) and pyrethrins are applied together does not operate in higher organisms such as mammals, which have more sophisticated detoxification enzyme systems than insects have. Thus, synergism is not a concern in humans.	Comments were about aquatic life; response was about humans.
2. Risk assessment should include urban runoff modeling. (CASQA, Water Board)	EPA/OPP does not have a peer-reviewed model for estimation of water impacts from urban use of pesticides. Adoption of the models suggested by the commenters (HSPF and SWMM) would require formal review by the Science Advisory Panel. These considerations aside, the PRZM-EXAMS modeling in the risk assessment was based on the maximum number of applications (10), at the maximum rate (0.5 lb/acre) and the minimum intervals (14 days), for agricultural use. This assessment is considered to be protective of human health.	They appear to be using the SAP review requirement as an excuse. Urban application frequencies & rates are higher.
3. Mosquito abatement use modeling underestimates risks (Water Board)	<p>The assessment of ecological exposure to PBO has uncertainties that tend to both overestimate and underestimate exposure, with the result that the exposure estimate is believed to be reasonable for a screening-level assessment.</p> <p>EFED's exposure analysis (using the Interim Rice Model) for mosquito abatement assumes that fogging will occur over or near bodies of water at dusk. For a conservative (maximum exposure) assessment, EFED assumes that 100% of PBO suspended as a fog will eventually settle by gravity into the water body. We [EPA] make the further conservative assumption that PBO does not degrade in the water body (even though the parent aqueous photolysis half-life is 0.7 days). Thus, repeated applications may result in approximately the same maximum concentration as a single application.</p>	Risk mitigation should limit application frequency to amount modeled (plus any reduction to address risks.)

**Table B-5. Piperonyl Butoxide (PBO) Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
<p>4. Risk assessment omits critical aquatic toxicity data (Water Board)</p>	<ul style="list-style-type: none"> • A review of the database shows that <i>Oncorhynchus mykiss</i> 96 hr LC50 of 2.4 ppb was for the piperonyl butoxide (PBO) and resmethrin mixture. The risk assessment was not intended to cover mixtures but only PBO. • A review of the database shows that <i>Lepomis machrochirus</i> 96 hr LC50 of 4.2 value is in ppm and not in ppb. • A review of the database shows that <i>Ceriodaphnia dubia</i> 48 hr LC50 of 330 ppb can not be located. There is an <i>Mercenaria merenari</i> (Qualog clam) that has a LC50 value of 330 ppb. This clam is tested with PBO and resmethrin. The risk assessment was not intended to cover mixtures but only PBO. • A search of the database could not find an acceptable study of <i>Penaeus duorarum</i> for PBO. There is one for PBO and resmethrin with LC50 value of 1.25 ppb. <p>Additional searches in the database could not find any aquatic organism with LC50 of 34 ppb for PBO. Based on the above findings, no change will be made in the risk assessment.</p>	<p>They may be looking at the OPP data base and not ECOTOX.</p> <p>ECOTOX did not report the data for <i>Oncorhynchus mykiss</i> or <i>Penaeus duorarum</i> as being for mixtures.</p> <p>Data in ECOTOX on <i>Lepomis machrochirus</i> has been corrected in ECOTOX (it is ppm).</p> <p>Searched ECOTOX on 10/28/05 and found the <i>Ceriodaphnia dubia</i> data again. Original data source is: Bailey, H.C., C. DiGiorgio, K. Kroll, J.L. Miller, D.E. Hinton, and G. Starrett (1996). "Development of Procedures for Identifying Pesticide Toxicity in Ambient Waters: Carbofuran, Diazinon, Chlorpyrifos." <i>Environ. Toxicol. Chem.</i> 15(6):837-845.</p>
<p>5. Water quality criteria are needed for PBO. (Water Board)</p>	<p>OPP will consult with the Office of Water on this issue should it become clear that toxicologically significant concentrations of PBO will be found in waterways.</p>	<p>EPA risk assessment found acute risk to amphibians, freshwater invertebrates and freshwater fish and chronic risk to freshwater invertebrates and freshwater fish.</p>

**Table B-5. Piperonyl Butoxide (PBO) Preliminary Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
<p>6. Most PBO use is non-agricultural. Sewer discharges should be considered in risk assessment. (LACSD, Tri-TAC)</p>	<p>EPA/OPP does not have a peer-reviewed model for estimation of water impacts from urban use of pesticides. Adoption of the models suggested by the commenters (HSPF and SWMM) would require formal review by the Science Advisory Panel.</p> <p>EPA has no information to indicate that PBO from indoor/pet shampoo will pass through sewage treatment plants intact. The available data indicate that PBO is metabolized by soil microorganisms and photolyzed in water, thus it is reasonable to expect that it would be degraded in sewage treatment.</p>	<p>Two separate responses to the same comment. The first response refers to urban runoff models suggested by other commenters (completely unrelated to this comment). They apparently aren't aware that EPA did sewer discharge modeling for permethrin. The second response is based on conjecture, not science.</p>
<p>7. U.S. EPA should consider head lice treatments (LACSD, Tri-TAC)</p>	<p>EPA has no information to indicate that PBO from head lice treatments will pass through sewage treatment plants intact. The available data indicate that PBO is metabolized by soil microorganisms and photolyzed in water, thus it is reasonable to expect that it would be degraded in sewage treatment.</p>	<p>The response is based on conjecture, not science. It appears that EPA is saying that when it has no evidence of a problem, it assumes no problem exists.</p>
<p>8. Please coordinate with Office of Water on review of PBO. (Water Board)</p>	<p>No response.</p>	

**Table B-6. Pyrethrins Preliminary Risk Assessments Comment Summary
Comments from California Water Quality Agencies**

Comment	U.S. EPA Response	Notes
1. Risk assessment should include urban runoff modeling. (CASQA, Water Board)	The EFED does not have a standard model for urban runoff. The adoption of the models suggested by the commenters would require formal review by the Science Advisory Panel. Therefore, at this time, urban runoff will not be considered in the assessment.	They appear to be using the SAP review requirement as an excuse.
2. Mosquito abatement use modeling underestimates risks (Water Board)	The EFED used the maximum application rate, and the maximum number of applications allowed by the PRZM/EXAMS user interface (pe4). The label does not specify the maximum number of applications per year or interval between applications; therefore, the EFED used what it considered a reasonable conservative scenario, with a 4-day interval.	Risk mitigation should limit application frequency to amount modeled (plus any reduction to address risks).
3. EPA should consider head lice treatments (LACSD, Tri-TAC)	See #5 below.	
4. Water quality criteria are needed for pyrethrins. (Water Board)	The responsibility to establish water quality criteria belongs to the Office of Water (OW).	

**Table B-6. Pyrethrins Preliminary Assessments Comment Summary
Comments from California Water Quality Agencies (Continued)**

Comment	U.S. EPA Response	Notes
<p>5. 85% of pyrethrins use is indoors. Sewer discharges should be considered in risk assessment. (Water Board, LACSD, Tri-TAC)</p>	<p>The EFED’s assumptions to determine exposure for drinking waters and ecological effects are designed to be protective of the environment. Those uses that involve more exposure to wildlife are weighed more heavily (for example, the agricultural uses and the mosquito abatement). The EFED acknowledges that there are certain products (such as head lice treatment and pet shampoos) that may result in consumer disposal in wastewaters from household uses. Recently, the EFED conducted a national screening level assessment of a chemical (permethrin) that had numerous products (in addition to head lice treatment and pet shampoos) that could result in disposal in wastewaters from household uses. According to a modeling approach (EPISUITE), pyrethrins appear to have a better level of removal than permethrin in wastewater treatment plants. Nevertheless, the ecological analysis results for permethrin were of similar order of magnitude or lower than the results obtained for agricultural products. EFED believes that the exposure scenarios, using agricultural scenarios are protective of the environment; however, refinements may be done, should it be necessary.</p>	<p>They seem to not be aware that urban runoff and wastewater flow to wildlife habitat.</p> <p>No scientific justification for comparison to permethrin (different use rates & fates) or to agricultural modeling data (no linkage between sewer discharges and agricultural runoff).</p> <p>Note that the U.S. EPA permethrin analysis predicted adverse effects, including widespread exceedances of water quality criteria and frequent violations of NPDES permits.</p>
<p>6. Please coordinate with Office of Water on review of pyrethrins. (Water Board)</p>	<p>No response.</p>	