

ATTACHMENT TWO**DESCRIPTION OF SCIENTIFIC ASSUMPTIONS, FINDINGS, AND CONCLUSIONS
TO BE ADDRESSED BY PEER REVIEWERS****Total Maximum Daily Loads (TMDLs) for Toxicity and Pesticides
in the Santa Maria Watershed**

The statute mandate for external scientific peer review (Health and Safety Code Section 57004) states that the reviewer's responsibility is to determine whether the scientific portion of the proposed rule is based upon sound scientific knowledge, methods, and practices.

Accordingly, we request that you make this determination for each of the following issues that constitute the scientific basis of the proposed regulatory action. An explanatory statement is provided for each issue to focus the review.

Additionally, note that a complete TMDL must contain all of the following elements in order to be approved by the U.S. EPA: 1) Problem Statement; 2) Numeric Targets; 3) Source Analysis; 4) Allocations; 5) Implementation Plan; 5) Linkage Analysis; 6) Monitoring Plan; 7) Margin of Safety. However, from the perspective of striving for adequate scientific credibility to support this TMDL, staff recommends that the following discrete TMDL elements require the bulk of critical focus and scrutiny on the scientific basis underlying these elements:

- 1) Numeric Targets
- 2) Source Analysis
- 3) TMDLs and Allocations
- 4) Implementation
- 5) Monitoring

As such, the elements of this TMDL staff are recommending focused peer review are outlined below:

1. **Numeric Targets - *Primary Scientific Issue: The scientific basis for the assignment of numeric targets for specific pesticides addressed in the TMDL.***

Numeric targets are measurable indicators that demonstrate attainment of water quality standards. The foundation of the numeric targets in this TMDL are narrative water quality objectives in the Central Coast Basin Plan (Basin Plan) for toxicity. To develop numeric targets, staff researched and applied published water, sediment and tissue toxicity guidelines to interpret the objectives in the Basin Plan. In addition, pesticides can have additive toxicity and staff applied an additive toxicity formula and developed toxicity unit targets for organophosphate pesticides. The specific numeric targets developed for the TMDL and reference papers are located in Attachment Five.

Table 1 Chemicals and Numeric Targets Developed for the TMDL

Chemicals	Numeric Targets			
	Water	Sediment	Tissue	Toxicity Unit
Chlorprifos	X	X		X
Diazinon	X			X
Malathion	X			
Synthetic Pyrethroids	X	X		X
DDTs	X	X	X	
Dieldrin	X	X	X	
Endrin		X		
Toxaphene	X	X	X	

2. **Source Analysis - *Primary Scientific Issue:* The methodologies, data and assumptions used , and conclusions made in identifying probable source categories contributing toxicity and pesticide pollution in surface waters.**

Surface waters in the Santa Maria watershed are impaired for Unknown toxicity, sediment toxicity and specific pesticides. Several studies in the watershed indicate that the unknown toxicity and the sediment toxicity are associated with currently applied organophosphate and pyrethroid pesticides. In addition for the development of the TMDL, additional toxicity and pesticide monitoring was conducted by UC Davis that confirmed the association of toxicity to currently applied pesticides (Phillips, 2010). Therefore the focus of the source analysis for toxicity is on these pesticide groups.

The sources of pesticides were analyzed by pesticide group (organophosphate, synthetic pyrethroid and organochlorine) since the groups share general chemical properties and environmental fate and transport mechanisms. The groups also have common uses and application timeframes.

Both organophosphate and synthetic pyrethroids are currently applied pesticides, therefore, sources of commercial applications reported to the California Department of Pesticide Regulations (DPR) were analyzed at the watershed level (CDPR, 2000). This analysis coincided with water quality monitoring.

The use of organochlorine pesticides has been banned for many years, but they are very persistent in the environment. Staff analyzed reports on historic use and tributary streams and channels were monitored to assess sources.

In addition, land cover and land use was analyzed in the watershed and subwatersheds to evaluate sources of pollutants.

3. TMDLS and Allocations - *Primary Scientific Issue: The scientific and technical basis of the proposed TMDLs and allocation.*

TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure [40 CFR §130.2(l)]. Staff is proposing concentration-based TMDLs. Staff proposes the TMDLs as the same set of concentrations as staff proposed in the numeric targets section.

The TMDL load allocations are equal to the numeric targets. Discharges shall not exceed the loading capacity of the water body, which is set at the proposed numeric targets. All identified responsible parties within the TMDL project will be held to these waste load and load allocations.

Although the TMDLs are officially expressed in terms of concentration, the daily loading capacity for impaired waters is expressed in the project report through load duration curve analysis. Daily Load Expressions represent an alternative way to express the concentration-based allocations for water soluble pesticide such as diazinon and chlorpyrifos. The mass-based daily load expressions do not formally constitute the TMDL or the allocations.

4. Implementation - *Primary Scientific Issue: The technical basis of the proposed implementation and monitoring plans.*

Due to the types of water quality problems, pesticide properties and nature of the sources, the TMDL implementation is divided into two implementation plans, one for currently applied pesticides and one for legacy organochlorine pesticides.

Implementation Plan Currently Applied Pesticides

The TMDL implementation plan for currently applied pesticides utilizes an interagency approach between DPR and the Water Boards to address pesticide impairments in the Santa Maria Watershed. The approach is described in the California Pesticide Management Plan for Water Quality (California Pesticide Plan), which is an implementation plan of the Management Agency Agreement (MAA) between DPR and the Water Boards. The Water Boards and DPR have responsibilities to protect water quality from the potential adverse effects of pesticides and the MAA was established to provide a unified cooperative program to protect water quality related to the use of pesticides (CEPA 1997).

The California Pesticide Plan outlines a four-stage approach to respond to pesticide water quality problems. The approach includes stages for education and outreach, self-regulating compliance and mandatory regulatory actions by the two agencies. In addition the TMDL relies on regulatory pesticide label changes by United States

Environmental Protection Agency on the application of diazinon and pyrethroids to address water quality problems.

Implementation Plan for Legacy Organochlorine Pesticides

For the organochlorine pesticide implementation plan staff proposes a community-based watershed approach to address organochlorine pesticide water quality problems in the Santa Maria watershed with the implementation lead by stakeholders (EPA, 2005). Staff proposes a community-based watershed approach due to the complex nature of organochlorine pesticides in the environment, the extended duration of organochlorine pesticide water quality problems, and the broad stakeholder group necessary to address this problem. While a community-based watershed approach is recommended to address organochlorine problems, the primary regulatory responsibility for the OC pesticide implementation plan is with the landowners in the watershed with sites that are the sources of organochlorine pesticides. A landowner stakeholder group shall be developed to support implementation of the TMDL.

5. Monitoring Plan - Primary Scientific Issue: The scientific and technical basis of the proposed monitoring plan

Monitoring Plan Currently Applied Pesticides

The monitoring of currently applied pesticides is the responsibility of dischargers enrolled in existing storm water and irrigated agricultural lands regulatory programs (Ag. Order) with the Water Board. The TMDL monitoring plan builds on existing regulatory watershed monitoring programs such as the monitoring and reporting program for the Agricultural Order. The Agricultural Order monitoring program requires annual toxicity sampling and testing, twice in the dry season and twice in the wet season. The order also requires corresponding testing of specific pesticides during the second year of the five year order.

Monitoring Plan for Legacy Organochlorine Pesticides

Staff recommends a comprehensive watershed and coastal monitoring program for organochlorine pesticides pollution. Due to significant health concerns from organochlorine pesticides, their persistence in the environment and bioaccumulation in the food chain, a long-term monitoring program is needed to provide consistent monitoring of sediment and regular feedback on the safety of fish for human consumption.

6. The Big Picture

Reviewers are not limited to addressing only the specific issues presented above,

and are asked to contemplate the following questions:

- a) In reading the technical reports and proposed implementation language, are there any additional scientific issues that are part of the scientific basis of the proposed rule not described above? If so, please comment with respect to the statute language given above.**
- b) Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?**

Reviewers should also note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statute requirement for absolute scientific rigor. In these situations, the proposed course of action is favored over no action.

The preceding guidance will ensure that reviewers have an opportunity to comment on all aspects of the scientific basis of the proposed Board action. At the same time, reviewers also should recognize that the Board has a legal obligation to consider and respond to all feedback on the scientific portions of the proposed rule. Because of this obligation, reviewers are encouraged to focus feedback on the scientific issues that are relevant to the central regulatory elements being proposed.