STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF April 18-19, 2024

Prepared on April 3, 2024

ITEM NUMBER: **9**

SUBJECT: **Proposed Amendment to the Water Quality Control Plan for the Central Coastal Basin to Establish Total Maximum Daily Loads for Organophosphate Pesticides and Toxicity in the Lower Salinas River Watershed, Monterey County, California**

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ACTION: **Consideration of Adoption of Resolution R3-2024-0002**

SUMMARY

Staff recommends the Central Coast Regional Water Quality Control Board (Central Coast Water Board) adopt Resolution R3-2024-0002 (see Attachment 2 - Resolution), adopting the proposed Basin Plan amendment (see Attachment A to Resolution R3-2024-0002) to establish Total Maximum Daily Loads (TMDLs) for organophosphate pesticides and toxicity in the lower Salinas River watershed and the associated implementation plan (TMDL Project). Adoption of this Resolution will amend the Water Quality Control Plan for the Central Coastal Basin (Basin Plan) to establish these TMDLs and the implementation plan and approve the Supplemental Environmental Documentation for this TMDL Project (see Attachment 3 - CEQA Checklist and Analysis Report). The TMDL implementation plan describes how the Central Coast Water Board's regulatory mechanisms (e.g., permits and enforcement actions) will address organophosphate pesticide loading and toxicity, from various sources, to attain the water quality standards[1] necessary to restore aquatic life habitats.

The federal Clean Water Act section 303(d) List of impaired waters (303(d) List) identifies several streams in the lower Salinas River watershed as impaired (i.e., not meeting water quality standards) due to one or more of the following conditions: excessive concentrations of the organophosphate pesticides chlorpyrifos, diazinon, malathion, and/or toxicity. This TMDL Project addresses the impairment(s) of the following waterbodies: Moro Cojo Slough, Old Salinas River, Salinas River Lagoon (North), Tembladero Slough, Merritt Ditch, Alisal Slough, Alisal Creek, Blanco Drain, Salinas Reclamation Canal, lower Salinas River, Espinosa Slough, Gabilan Creek, Natividad Creek, Santa Rita Creek, Quail Creek, and Chualar Creek. This TMDL Project addresses these water quality impairments by assigning TMDL allocations to sources of

[1] USEPA defines water quality standards as consisting of three elements: designated uses for each waterbody, criteria to protect those uses, and consideration of the anti-degradation requirements.

organophosphate pesticides in the watershed and by describing an implementation plan to achieve those allocations.

A TMDL is the maximum amount of a pollutant that a waterbody can receive while still meeting water quality standards and the goal of this TMDL Project is to restore water quality in the lower Salinas River watershed and attain the water quality objectives for pesticides and toxicity, thereby protecting the designated beneficial uses of each waterbody. Achieving this goal will also allow for removal of organophosphate pesticide and toxicity impaired waters from the 303(d) List.

DISCUSSION

Background

The lower Salinas River watershed encompasses an area of approximately 405 square miles in northern Monterey County (see Figure 1 at end of staff report). The project area extends north from the City of Gonzales to Monterey Bay and the Pacific Ocean. There are two major subwatersheds in the TMDL Project area, which terminate at Moss Landing Harbor: the lower Salinas River and its tributaries, and the Salinas Reclamation Canal and its tributaries.

Chlorpyrifos, diazinon, and malathion are man-made pesticides primarily used in the lower Salinas River watershed for agricultural purposes; however, malathion is also used in urban areas and therefore will require more than one regulatory mechanism (permit) to address the impairments. The agricultural application of chlorpyrifos and diazinon has declined significantly since 2006; however, malathion application rates for agricultural purposes have remained consistently high and detection in surface waters has significantly increased since 2006. In addition, all waterbodies within the lower Salinas River watershed exhibit significant toxicity to the survival of one or more toxicity test species.

These organophosphate pesticides have synergistic or additive toxicity effects on aquatic organisms. Surface waters that contain a mixture of organophosphate pesticide compounds can be toxic to aquatic organisms when the concentration of any individual pesticide is below a threshold of concern. The addition of malathion to the evaluation of additive effects increases the accuracy of additive toxicity calculations.

All waterbodies within the TMDL Project area exhibit significant toxicity to one or more invertebrate test organisms. Although the water flea (*Ceriodaphnia dubia*) is the toxicity test organism that is most “sensitive” to organophosphate pesticides, sublethal effects such as reduced growth or reproduction of other invertebrate test organisms has been attributed to organophosphate pesticides and additive effects of organophosphate pesticides.

At the April 18-19, 2024 Central Coast Water Board meeting, the Board will reconsider the adoption of the proposed Basin Plan amendment for this TMDL Project following additional scientific peer review and changes to the attainment date for malathion. The series of events leading to this adoption hearing are summarized below. On June 16, 2022, the Central Coast Water Board adopted a previous version of this proposed Basin

Plan amendment and approved the substitute environmental documentation (SED) via Resolution R3-2022-0020,[2] where staff did not receive any public comments. As part of the next approval step in the process, approval by the State Water Board, on September 17, 2022, Central Coast Water Board staff (staff) issued a Notice of Availability for Public Comment and a Notice of State Water Board Meeting[3] to be held on November 15, 2022. A public comment letter was submitted to the State Water Board regarding a missing reference in the TMDL Project Technical Report and the need for scientific peer review to include malathion in the additive toxicity numeric targets calculation. Staff documented the public comments, provided staff responses,[4] and subsequently proceeded with external scientific peer review. The peer reviewers confirmed that the additive toxicity numeric targets for the three organophosphate pesticides, including malathion, are scientifically valid (see Attachment 4 - External Scientific Peer Review and Staff Responses).

Staff revised the TMDL Project documentation to incorporate the external scientific peer review comments and on November 2, 2023, provided a notice for public review and comment. Staff received one public comment letter that suggested changes to compliance dates in the proposed Basin Plan amendment documents (see Attachment 5 - Public Comments Received and Staff Responses). Staff subsequently revised the proposed Basin Plan amendment documents to reflect changes to the compliance dates (see Attachment 6 - Change Sheet) and on January 22, 2024, issued a notice of opportunity to provide public comments on the proposed changes to the revised Basin Plan amendment documents. Staff received one public comment letter opposing the change to the TMDL compliance date and proposing new changes to the TMDL compliance dates. Staff provided responses to these comments (see Attachment 5 - Public Comments Received and Staff Responses) but did not make additional changes to the TMDL compliance dates. The TMDLs and proposed Basin Plan amendment must now be reconsidered for adoption by the Central Coast Water Board.

Data Sources

To develop this TMDL Project, staff used various types of data including the following: water quality, land use, hydrologic, climatic, soils, ecological, demographic, groundwater, and other environmental data from public agencies and scientific sources. Data acquisition, compilation, and analyses are described more fully in the TMDL Project Technical Report (see Attachment 2, Section 6).

Source Analysis

Several methods were used to identify sources of organophosphate pesticides in the watershed including water quality monitoring results from various programs, pesticide use reports provided by the California Department of Pesticide Regulation, special studies, field observations, and discussions with stakeholders. The main source of organophosphate pesticides and aquatic toxicity is irrigated agriculture, while various

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[2] https://www.waterboards.ca.gov/centralcoast/board_decisions/adopted_orders/2022/r3-2022-0002-resolution.pdf

[3] https://www.waterboards.ca.gov/public_notices/comments/docs/2022/notice-r3-lower-salinas.pdf

[4] https://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/salinas/oppesticides/docs/sb-rtc.pdf

stormwater discharges (urban, construction, and industrial) are considered minor sources of malathion and aquatic toxicity. Other potential sources of organophosphate pesticides and aquatic toxicity include cannabis cultivation facilities and pesticide handling facilities, though these potential sources have not been confirmed as contributing to the identified impairments. The source analysis is contained within the TMDL Project Technical Report (see Attachment 2, Section 8).

Numeric Targets

Numeric targets are the TMDL Project goals that define the conditions necessary to protect designated beneficial uses of waters and define the TMDL allocations. This TMDL Project establishes acute and chronic numeric targets for each of the organophosphate pesticides; chlorpyrifos, diazinon, and malathion when present individually (Table 1). Concentration units are parts per billion (ppb) which are equivalent to micrograms per liter (ug/L).

Table 1. Water column numeric targets for individual organophosphate pesticides.

Compound	CMC [A] (ppb)	CCC [B] (ppb)
Chlorpyrifos	0.025	0.015
Diazinon	0.16	0.10
Malathion	0.17	0.028

[A] CMC – Criterion Maximum Concentration or acute (1- hour average). Not to be exceeded more than once in a three-year period.

[B] CCC – Criterion Continuous Concentration or chronic (4-day (96-hour) average). Not to be exceeded more than once in a three-year period.

These three organophosphate pesticides share a similar mechanism of toxic action and exhibit additive toxicity to aquatic invertebrates, therefore this TMDL Project establishes an additive toxicity numeric target when two or more organophosphate pesticides are present in the water column (Table 2).

Table 2. Equation for additive toxicity numeric target (S≤1).

$$\frac{C\ \text{Chlorpyrifos}}{NT\ \text{Chlorpyrifos}} + \frac{C\ \text{Diazinon}}{NT\ \text{Diazinon}} + \frac{C\ \text{Malathion}}{NT\ \text{Malathion}} = S;\ S \leq 1$$

Where:
C = the concentration of a pesticide measured in the receiving water.
NT = the numeric target for each pesticide present.
S = the sum; a sum exceeding one (1.0) indicates that beneficial uses may be adversely affected.

In addition to the concentration-based numeric targets, this TMDL Project will also establish a toxicity numeric target stated as the following:

> No significant toxic effect to the survival or sublethal (i.e., growth, reproduction, etc.) test endpoint.

The basis for the development of the numeric targets is contained with the TMDL Project Technical Report (see Attachment 2, Section 7).

TMDLs

The TMDLs for organophosphate pesticides in the lower Salinas River watershed are the same numeric value as the individual acute and chronic organophosphate pesticide receiving water numeric targets identified in Table 1 and the additive toxicity organophosphate pesticides receiving water numeric targets referenced in Table 2.

Waterbodies in the lower Salinas River watershed assigned organophosphate pesticide concentration TMDLs and organophosphate pesticide additive toxicity TMDLs are listed in Table 3.

Table 3. Waterbodies assigned TMDLs.

Moro Cojo Slough
Old Salinas River
Salinas River Lagoon (North)
Tembladero Slough
Merritt Ditch
Alisal Slough
Alisal Creek
Blanco Drain
Salinas Reclamation Canal (Lower)
Salinas Reclamation Canal (Upper)
Salinas River
Espinosa Slough
Gabilan Creek
Natividad Creek
Santa Rita Creek
Quail Creek
Chualar Creek

TMDL Allocations

To address organophosphate pesticides, additive toxicity, and toxicity impairments in the lower Salinas River watershed, TMDLs for organophosphate pesticides and additive toxicity are allocated to point and nonpoint sources of discharge. Point source discharges, such as urban stormwater, are regulated with NPDES permits and are assigned waste load allocations, while nonpoint sources, such as irrigated agricultural discharges, are considered nonpoint sources and are assigned load allocations. For this

TMDL Project, the waste load allocations presented in Table 4 and the load allocations presented in Table 5 are both equal to the organophosphate pesticide TMDLs.[5]

Table 4. Waste Load Allocations.

Responsible Party	Permit/Order	Source	Allocation
City of Salinas	Phase I MS4 Stormwater Permit (Order R3-2019-0073, NPDES CA0049981)	Municipal stormwater	As contained in: Table 1 Table 2
County of Monterey	State Water Board Phase II MS4 General Stormwater Permit (Order 2013-0001 DWQ)	Municipal stormwater	As contained in: Table 1 Table 2
Industrial General Permit enrollees	Industrial General Permit (Order 2009-0009 amended by Order 2014-0057-DWQ, NPDES CAS000001)	Industrial stormwater	As contained in: Table 1 Table 2
Construction General Permit enrollees	Construction General Permit (Order 2012-0006-DWQ, NPDES CAS000002)	Construction stormwater	As contained in: Table 1 Table 2

Table 5. Load Allocations.

Responsible Party	Permit/Order	Source	Allocation
Owners/operators of irrigated agricultural lands or facilities	General Waste Discharge Requirements for Discharges from Irrigated Lands (Order R3-2021-0040)	Irrigated agriculture, nurseries, greenhouses	As contained in: Table 1 Table 2
Owners/operators of cannabis cultivation facilities	General Waste Discharge Requirements and Waiver of Waste Discharge Requirements for Discharges of Waste Associated with Cannabis Cultivation Activities (Order WQ 2019-0001-DWQ)	Cannabis cultivation, nurseries, greenhouses	As contained in: Table 1 Table 2
Handlers of fertilizer or pesticides subject to Waste Discharge Requirements	General Waste Discharge Requirements for Fertilizer/Pesticide Handling (Order R3-2005-0001) and Individual Waste Discharge Requirements (Orders)	Fertilizer/pesticide handling facilities	As contained in: Table 1 Table 2

[5] The terms “waste load allocation” and “load allocation” are functionally equivalent, and they are only used to differentiate between allocations assigned to point source discharges and nonpoint source discharges, respectively.

Implementation Plan

The TMDL Project Technical Report (Attachment 2) and Basin Plan amendment (Attachment A to the proposed Resolution) include an implementation plan that identifies the regulatory mechanisms and the actions necessary for responsible parties to meet their TMDL allocations. In summary, the TMDL implementation plan relies on existing permits. A description of the TMDL implementation plan can be found in the proposed Basin Plan amendment, pages 10 through 18. The implementation of the waste load allocations and load allocations for all dischargers subject to the TMDLs are **also set forth in Tables 4 and 5, above.**

TMDL Compliance Schedule and Milestones

The discharge of organophosphate pesticides and presence of toxic conditions within waterbodies of the lower Salinas River watershed affect a broad spectrum of beneficial uses and are, therefore, serious water quality problems. As such, implementation should occur at an accelerated pace to achieve the TMDL allocations in the shortest time-frame feasible.

The TMDL attainment date to achieve TMDL allocations for chlorpyrifos and diazinon and the additive toxicity of chlorpyrifos and diazinon is December 31, 2032.[6]

The TMDL attainment date to achieve TMDL allocations for malathion and the additive toxicity of malathion in the presence of chlorpyrifos and/or diazinon is December 31, 2032.[7]

Climate Change

The Central Coast faces the threat and the effects of climate change for the foreseeable and distant future. To proactively prepare and respond, the Central Coast Water Board has launched the Central Coast Water Board's Climate Action Initiative, which identifies how the Central Coast Water Board's work relates to climate change and prioritizes actions that improve water supply resiliency through water conservation and wastewater reuse and recycling; mitigate for and adapt to sea level rise and increased flooding; improve energy efficiency; and reduce greenhouse gas production. The Climate Action Initiative is consistent with the Governor's Executive Order B-30-15 and the State Water Board's Climate Change Resolution 2017-0012.

This TMDL Project's implementation plan incorporates irrigation management methods to reduce runoff into streams, reduce the use of water, and restore surface and groundwater resources. Implementation methods that would incorporate riparian protection, vegetated buffers, and wetland treatment systems will increase carbon sequestration and protect sensitive ecosystems and aquatic habitats. Restoring riparian

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[6] This date is consistent with the compliance dates currently established in the General Waste Discharge Requirements for Discharges from Irrigated Lands, Order R3-2021-0040 (Agricultural Order) for chlorpyrifos and diazinon in TMDL areas (see Agricultural Order, Table C.3-4). Agricultural Order Website: https://www.waterboards.ca.gov/centralcoast/water_issues/programs/ilp/regulatory_information.html

[7] This date is consistent with the receiving water limit compliance date set forth in the current Agricultural Order for malathion in non-TMDL areas (see Agricultural Order, Table C-3.5).

habitat not only protects waterbodies from these pollutants in runoff but also provides shading which serves to mitigate increases in water temperature.

Human Right to Water

California Water Code section 106.3, subdivision (a) states: It is a policy of the State of California "that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitation purposes." On January 26, 2017, the Central Coast Water Board adopted Resolution R3-2017-0004 [8] which affirms the realization of the human right to water and the protection of human health as the Central Coast Water Board's top priorities.

This TMDL Project addresses the human right to water by identifying sources of organophosphate pesticides and toxicity and establishing a TMDL implementation plan and schedule to attain water quality standards and improve water quality in the lower Salinas River watershed. Waterbodies in the watershed are designated for aquatic life, recreation, and municipal and domestic water supply beneficial uses. Attaining water quality standards and the TMDL allocations established in this TMDL Project for the protection of aquatic life also protects human health by protecting potential sources of drinking water. Because diazinon and malathion are soluble pesticides, attaining the goals of this TMDL Project will also abate potential threats to groundwater.

Environmental Justice

Environmental Justice principles call for the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in the development, adoption, implementation, and enforcement of all environmental laws, regulations, and policies that affect every community's natural resources and the places people live, work, play, and learn. The Central Coast Water Board implements regulatory activities and water quality projects in a manner that ensures the fair treatment of all people, including Underrepresented Communities. Underrepresented Communities include but are not limited to Disadvantaged Communities (DACs), Severely Disadvantaged Communities (SDACs), Economically Distressed Areas (EDAs), Tribes, Environmentally Disadvantaged Communities (EnvDACs), and members of Fringe Communities.[9]

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[8] https://www.waterboards.ca.gov/centralcoast/board_decisions/adopted_orders/2017/2017-0004_hrtw_fnl.pdf

[9] Disadvantaged Community: a community with an annual median household income that is less than 80% of the statewide annual median household income (Public Resources Code section 80002(e)); Severely Disadvantaged Community: a community with a median household income of less than 60% of the statewide average. (Public Resources Code section 80002(n)); Economically Distressed Area: a municipality with a population of 20,000 persons or less, a rural county, or a reasonably isolated and divisible segment of a larger municipality where the segment of the population is 20,000 persons or less with an annual median household income that is less than 85% of the statewide median household income and with one or more of the following conditions as determined by the department: (1) financial hardship, (2) unemployment rate at least 2% higher than the statewide average, or (3) low population density. (Water Code section 79702(k)); Tribes: federally recognized Indian Tribes and California State Indian Tribes listed on the Native American Heritage Commission's California Tribal Consultation List; EnvDACs: CalEPA designates the top 25 percent scoring census tracts as DACs. Census tracts that score the highest five percent of pollution burden scores but do not have an overall CalEnviroScreen score because of unreliable socioeconomic or health data are also designated as DACs (refer to the CalEnviroScreen 3.0 Mapping Tool or Results Excel Sheet); Fringe Community: communities that do

Furthermore, the Central Coast Water Board is committed to providing all stakeholders the opportunity to participate in the public process and provide meaningful input to decisions that affect their communities. Staff conduct focused outreach to ensure all interested parties are notified of opportunities to participate in the planning and implementation of this TMDL Project.

Several DACs and SDACs are located within the lower Salinas River watershed and staff recognize that the cost of implementation may be significant and could be a burden to these communities. The TMDL Project Technical Report (Attachment 2, Section 4.3.3) provides a map showing the location of DACs and SDACs in the lower Salinas River watershed. By identifying DACs and SDACs in the project area, staff and stakeholders will be able to increase and focus outreach and work towards identifying grant funds to reduce the implementation costs.

All outreach was conducted in accordance with AB 2108. For example, staff contacted the Native American Heritage Commission to obtain a list of tribes with traditional lands or cultural places in Monterey County, then notified these tribal representatives of this TMDL Project and provided them opportunities to engage in consultation. Representatives of these tribes were individually notified and invited to request consultation at the start of the public process for this TMDL Project. In addition, staff notified environmental justice representatives of organizations that assist DACs, SDACs and other underrepresented communities in the lower Salinas River watershed about the TMDL Project and solicited their input. Further detail about our public outreach and involvement activities are documented in Attachment 2 of this staff report.

California Environmental Quality Act (CEQA)

The CEQA Checklist and Analysis Report (Attachment 3 to this staff report) provides the environmental analysis required by Public Resources Code section 21159. Analysis pursuant to the CEQA Environmental Checklist suggests TMDL Project implementation would have no potentially significant impacts on the environment.

Public Outreach and Involvement

Public outreach and public involvement are important aspects of the TMDL development process. Our public engagement process included regular TMDL updates, progress reports, scheduled public meetings, and solicitation of public feedback via our stakeholder e-mail subscription list consisting of over 250 interested persons. These stakeholders represented a wide range of interests, including agricultural interests, local residents, public agencies, environmental groups, local businesses, researchers, local resource professionals, underrepresented communities, tribes, and others. Specifically, throughout development of this TMDL Project, staff conducted public outreach to and held meetings including three public meetings and a public comment period in advance of the June 2022 Board Hearing, a public comment period in advance of the September 2022 State Water Board approval meeting, and two public comment periods in advance of this April 2024 adoption hearing. The public meetings

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not meet the established DAC, SDAC, and EDA definitions but can show that they score in the top 25 percent of either the Pollution Burden or Population Characteristics score using the CalEnviroScreen 3.0.

and comment periods provided multiple opportunities to engage with the individual interested parties listed below and provide opportunities for interested parties to review the key components of the TMDL Project, provide feedback, and discuss questions.

- City of Salinas staff
- County of Monterey staff
- Representatives of Monterey County Farm Bureau
- Representatives from California Department of Fish and Wildlife
- Representatives of the agricultural community
- Central Coast Water Quality Preservation, Inc.
- Tribal representatives within Monterey County
- Underrepresented communities within Monterey County
- Monterey County Agricultural Commission
- Moss Landing Marine Labs
- Monterey Bay National Marine Sanctuary
- California Coastkeeper Alliance
- Monterey Waterkeeper
- Other individuals interested in water quality of the lower Salinas River watershed

Additional information about outreach to native American tribal representatives and environmental justice groups are summarized in the Environmental Justice section above.

Public Comments

There were two formal public comment periods for this revised TMDL Project. On November 2, 2023, Central Coast Water Board staff distributed a notice of opportunity to provide public comment on this proposed Basin Plan amendment and the TMDL Project's draft CEQA Checklist and Analysis Report. Staff received one public comment letter that suggested changes to compliance dates in the proposed Basin Plan amendment documents (see Attachment 5 - Public Comments Received and Staff Responses). Staff revised the proposed Basin Plan amendment documents to reflect changes to the compliance dates (see Attachment 6 - Change Sheet) and on January 22, 2024, issued a notice of opportunity to provide public comments on the proposed changes to the revised Basin Plan amendment documents. Staff received one public comment letter proposing changes to the TMDL compliance dates and provided responses (see Attachment 5 - Public Comments Received and Staff Responses).

A notice of public hearing for this proposed action was also issued on March 1, 2024, via the e-mail subscription service, newspaper publications, and website posting (see Attachment 7– Notice of Public Hearing).

CONCLUSION

Nearly all surface waters within the lower Salinas River watershed are impaired due to excessive concentrations of one or more organophosphate pesticides and toxicity. This TMDL Project establishes numeric targets to achieve water quality standards protective of beneficial uses, assigns TMDL allocations to responsible parties, and includes an

implementation plan to address the sources of organophosphate pesticides and toxicity within in the watershed.

RECOMMENDATION

Adopt Resolution R3-2024-0002 as proposed.

ATTACHMENTS

Attachment 1: Resolution R3-2024-0002 and Basin Plan amendment (Attachment A to the Resolution)

Attachment 2: TMDL Project Technical Report

Attachment 3: CEQA Checklist and Analysis Report

Attachment 4: External Scientific Peer Review and Staff Responses

Attachment 5: Public Comments Received and Staff Responses

Attachment 6: Change Sheet

Attachment 7: Notice of Public Hearing

FIGURES

Figure 1. Map of the lower Salinas River watershed.