




# FOCUS GROUP MEETINGS—SPRING/SUMMER 2014
# PROPOSED STATEWIDE MERCURY AMENDMENT

The State Water Resources Control Board (State Water Board) is developing an amendment to the statewide Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries to include water quality objectives for methylmercury and mercury control programs (proposed mercury amendment). The primary goal of the proposed mercury amendment is to restore and improve the chemical, physical, and biological integrity of California's water bodies by reducing levels of mercury in order to support the beneficial uses of fish consumption by humans and wildlife.

## I. Purpose of Focus Group Meetings

The purpose of the focus group meetings is for the State Water Board to present the purpose and the initial scope of the proposed mercury amendment, and to gather feedback from key groups to aid in the development of the draft regulatory proposal. This document identifies different options to be considered for each element of the proposed mercury amendment. The options are a starting point to generate discussion about the mercury amendment and will be modified as needed based on focus group meetings. This document also identifies the anticipated timeline for the draft mercury amendment and staff report, the public comment period, the State Water Board workshops, and the proposed mercury amendment adoption meeting.

## II. Background

Although mercury occurs naturally in the environment, mercury concentrations exceed background levels due to human activities. Gold and mercury mines; atmospheric deposition; industrial and municipal wastewater discharges; and urban storm water runoff are all sources of mercury that can enter lakes and rivers and accumulate in fish tissue to levels that can be toxic

to humans and wildlife. Additionally, dams and other hydrologic modifications trap mercury enriched sediment and change the chemistry of the water in ways that increase bioaccumulation in resident (both native and non-native) fish.

The form of mercury in fish tissue is primarily methylmercury, which is the most toxic form of mercury. Methylmercury is a potent neurotoxin that can impair memory, language, reasoning, and motor coordination, especially in developing children. In wildlife, methylmercury can affect reproductive success and behavior.

California's current statewide mercury criteria, established in the California Toxics Rule, are outdated since they have not been revised to reflect U.S. EPA's 2001 fish tissue criterion. In addition, the U.S. Fish and Wildlife Service determined that the California Toxics Rule mercury criteria would not protect endangered species as part of the 1998 draft jeopardy ruling. Therefore, a new water quality objective for mercury is needed.

Evaluations of fish tissue data using more recent thresholds for mercury in fish tissue, such as U.S. EPA's 2001 criterion, have revealed that mercury is negatively impacting the beneficial uses of human and wildlife fish consumption in many waters of the state (primarily the beneficial uses of Commercial and Sport Fishing [COMM], Wildlife Habitat [WILD], and Rare, Threatened, or Endangered Species [RARE]). As of 2010, more than 180 water bodies, including 74 reservoirs, are designated as impaired due to elevated levels of mercury in fish[1]. Consequently, the Office of Environmental Health Hazard Assessment has issued fish consumption advisories that warn people to limit their consumption of locally caught fish. The number of waters identified as impaired due to high mercury concentrations in fish is expected to increase substantially as new fish tissue monitoring data are collected and evaluated.

Pursuant to section 303(d) of the Clean Water Act, the State Water Board must identify all waters where required pollution controls are insufficient to support water quality standards and establish Total Maximum Daily Loads (TMDLs) to correct the water quality problems. A TMDL is a plan of action to reduce the pollutant to the level specified by a water quality objective. Two Regional Water Quality Control Boards (Regional Water Board) have adopted TMDLs and site-specific water quality objectives into their respective water quality control plans to address mercury. For example, established TMDLs pertain to the San Francisco Bay, Clear Lake, Cache Creek, and the Sacramento-San Joaquin Delta.

[1] http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml

## III. The Primary Elements of the Mercury Amendment

The proposed mercury amendment generally will apply to all inland surface waters, enclosed bays, and estuaries in California. However, staff proposes that the mercury amendment will not supersede existing mercury/methylmercury site-specific objectives for which a Regional Water Board has already adopted a mercury/methylmercury TMDL, including the implementation programs of those TMDLs.

The proposed mercury amendment has three primary elements:

1. **Water quality objective(s):** Regulatory limit(s) for mercury to protect people and wildlife that eat locally caught fish, expressed as concentrations of methylmercury in the fish tissue.
2. **Implementation Program:** A program to achieve the objectives(s) by controlling mercury discharges and production of methylmercury in water bodies, applicable to all waters except reservoirs and upstream watersheds which are included in the mercury control program for reservoirs, described in item no. 3, below.
3. **Mercury Control Program for Reservoirs:** A program of TMDL elements and implementation requirements in reservoirs and upstream mercury sources to attain the objectives where fish tissue concentrations of methylmercury exceed the objectives.

## IV. The Anticipated Schedule for the Development of the Proposed Mercury Amendment

| **Milestone** | **Estimated Date** |
|---|---|
| Focus group meetings (reservoir operators, fisheries agencies, environmental groups, Tribes, permitted dischargers) | May – September 2014 |
| Publicly available draft regulation and technical staff report | Fall 2014 |
| Scientific peer review and staff responses | Fall/ Winter 2014 |
| Draft substitute environmental documentation (i.e. project alternatives, environmental impacts, economic factors) | Fall/ Winter 2014 |
| Public comment period: Draft regulation, staff reports, and draft substitute environmental documentation | Spring 2015 |
| Board Workshop | Summer 2015 |
| Board Adoption Meeting | Fall 2015 |

# V. Options for the Mercury Amendment

Different options for major elements of the proposed mercury amendment are outlined below. Additional options may be identified during the focus group meetings.

## 1. Water Quality Objectives

The Clean Water Act requires the State Water Board to protect beneficial uses of waters of the United States within California. Water quality objectives are established to protect the beneficial uses of these waters. A water quality objective is the limit or level of a constituent of characteristic that is established for the reasonable protection of beneficial uses of water. Objectives must be based on sound (and peer reviewed) scientific rationale.

### 1.1. Which water quality objective(s) should be selected for protecting human health statewide?

a. Water quality objective of 0.3 mg/kg methylmercury in fish tissue. This objective would protect consumption of roughly one fish meal (8 oz) every two weeks of California freshwater/estuarine fish (and a moderate amount of store bought fish).

b. Water quality objective of 0.2 mg/kg methylmercury in fish tissue. This objective would protect consumption of one fish meal (8 oz) a week of California freshwater/estuarine fish (and a moderate amount of store bought fish).

c. Water quality objective of 0.05 mg/kg methylmercury in fish tissue. This objective would protect consumption of three fish meals (8 oz) a week (and a moderate amount of store bought fish). Alternatively, this objective would also protect consumption of four to five fish meals a week for people who only consume California freshwater/estuarine fish (no store bought fish).

d. If option “a” or “b” is chosen, then a separate water quality objective could be derived for people that eat large amounts of fish, to be applied on a site-specific basis (see also topic 4.1). A tribal fish consumption study is being conducted to gather information on fish consumption rates for Tribes.

### 1.2. Which fish species should be selected for the statewide water quality objective?

a. Apply the selected objective (from the section above) to fish that are highest in the food web (top predator fish that tend have highest levels of mercury, e.g. striped bass, black bass, large catfish). If a water body does not have these species, then the objective would be applied to the next highest fish in the food web (e.g. rainbow trout, carp).

b. Apply the selected objective (from the section above) to a mixture of the two types of fish described above, if present in the water body. (Fish lower on the food web tend to have less mercury so this option would be less stringent than option a).

**1.3. Depending on the options selected above, should the proposed mercury amendment include an additional water quality methylmercury objective to protect wildlife that eat fish?** If option "a" of the above is selected, the 0.3 mg/kg water quality objective, then a separate objective for wildlife will be needed because the U.S. Fish and Wildlife Service determined that the 0.3 mg/kg threshold will not be protective of two out of seven threatened or endangered species evaluated.

a. Derive a separate water quality objective for wildlife, e.g. 0.08 mg/kg for fish that wildlife prey on. This objective would apply to fish smaller than those used for the human health water quality objective. These smaller fish are also lower on the food web and typically have lower mercury levels. The need for this option is dependent on the other water quality objective options selected above.

b. Ensure that the water quality objective selected from the options above protects wildlife.

**1.4. Which water quality objective should be selected for protecting sensitive endangered species?** The first two options for the water quality objective of 0.3 and 0.2 mg/kg, above, and optional wildlife objective of 0.08 mg/kg, are unlikely to protect the endangered California least tern, a small, sensitive bird that feeds primary on fish.

a. A site-specific water quality objective of 0.03 mg/kg methylmercury in fish less than 50 mm (2 inches) for areas where the least tern live, or other small bird habitat as determined by the applicable Regional Water Quality Control Board (Regional Water Boards).

b. A statewide water quality objective of 0.03 mg/kg methylmercury in fish less than 50 mm (2 inches).

## 2. Implementation Program

Statewide plans that include water quality objectives must contain implementation programs to achieve the objectives. An implementation program must describe the nature of actions necessary to achieve the objectives, a time schedule for the actions to be taken, and the surveillance and monitoring activities to determine compliance with the objectives.

The proposed mercury amendment contains an implementation program applicable to all inland surface waters, enclosed bays, and estuaries and to discharges to those waters—except reservoirs and watersheds upstream of reservoirs, which will be subject to a separate control program and TMDL (described in section 3, below). The implementation program shall be designed to attain and protect the proposed water quality objectives. In addition, the implementation program will apply to waters that are not attaining the water quality objectives, not included in the mercury control program for reservoirs, and have not already been addressed by an existing TMDL. Additional TMDLs may be developed in the future for impaired waters not currently addressed by a mercury TMDL.

Mercury from California's historic mining and atmospheric deposition of mercury from global and local emissions are likely the major sources of mercury in California water bodies; current discharges are likely less significant sources. How should implementation for the following type of sources be addressed?

**2.1. What should the implementation program require of mine owners?** Mines or mine tailings can contribute mercury through erosion, storm water, or effluent discharges to water bodies.

> Regional Water Boards could continue to use existing regulatory tools, such as cleanup orders and permits (e.g. waste discharge requirements), to address discharges from mine sites and mining waste (including dredge tailings and dredge fields) that discharge mercury to surface waters. Such permits could require implementation of erosion and sediment controls.

**2.2. What should the implementation program require of nonpoint source dischargers (aside from mines) such as surface water runoff from forests, agricultural land, some urban areas, wetland/riparian areas, and hydromodifcations?** Soils in California can be either naturally enriched with mercury or contaminated with mercury from gold mining or atmospheric deposition. Landscape changes or activities that increase runoff or erosion can increase the transport of mercury into water bodies. Some wetlands and flooded agricultural lands can be a concern because low oxygen conditions and high organic matter content tend to increase methylation of inorganic mercury.

> Regional Water Boards could continue to use existing regulatory tools (e.g. permits) and base the requirements on State Water Board's *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program*. Permits could require enhanced sediment and erosion control. Also, dredging activities would be required to comply with 401 certification requirements.

**2.3. What should the implementation program require of storm water dischargers?** Storm water can transport mercury enriched sediments and atmospherically-deposited mercury to water bodies. Construction and road maintenance can affect erosion during storms. In urban and industrial settings, items containing mercury, if not properly disposed of, can also contribute mercury to storm water. In addition, storm drains that allow water to stagnate result in conditions that increase methylation of inorganic mercury.

a. Require best management practices (BMPs) for sediment and erosion control.
b. Require larger municipalities and agencies to implement mercury pollution prevention measures.
c. Establish targets which would trigger BMPs for industrial storm water dischargers that are anticipated to discharge mercury.
d. Require consideration of green infrastructure/low impact development, including structures that increase storm water infiltration or that capture storm water for reuse.
e. Any combination of the above.

**2.4. What should the implementation program require of municipal wastewater and industrial dischargers?** Major contributors of mercury to municipal wastewater treatment systems include dental offices, hospitals, and schools. The original sources may be mercury amalgam dental fillings, broken thermometers or other consumer products, and hospital equipment. However, since most wastewater treatment plants are efficient at removing mercury, wastewater treatment plants are a relatively minor source of mercury compared to other sources.

a. Effluent limits derived from the national bioaccumulation factor: Use a single national U.S. EPA bioaccumulation factor and a translator to calculate limits for discharges to all water bodies. This would be combined with a variance covering all municipal wastewater and industrial dischargers, which would waive the effluent limits where infeasible and instead stipulate interim requirements, such as performance based limits and reductions through pollution minimization programs.

b. Effluent limits derived from a site-specific bioaccumulation factor: Dischargers could measure mercury concentrations in fish and in the water column in order to calculate site-specific bioaccumulation factors, which would then be used to calculate effluent limits. Dischargers could collaborate in this effort. This option could also include a variance as described above.

c. Performance-based effluent limits derived using current, representative data on mercury concentrations in the effluent.

d. Combination of the above, such as: effluent limits based on bioaccumulation factors (Option a or Option b) for waters exceeding objective; and performance-based limits (Option c) for waters meeting the objective.

e. Load-based limits derived from dischargers' relative contribution to the watershed. See the option presented for the mercury control program for reservoirs for wastewater and industrial dischargers, in section 3 below.

## 3. Mercury Control Program for Reservoirs

The proposed mercury amendment includes a mercury control program specifically for reservoirs. The mercury control program for reservoirs includes an implementation program for reservoirs and upstream mercury sources where reservoir fish tissue concentrations of methylmercury exceed the water quality objectives. Additionally, the mercury control program for reservoirs includes TMDL elements (i.e. numeric targets, assimilative capacity, allocations, and a margin of safety.

**3.1. Should the mercury control program for reservoirs include water chemistry and fisheries management components?** Evidence exists which indicates traditional source controls (the control requirements described in section 2, above) are insufficient to reduce methylmercury in reservoir fish, and that we need to consider developing additional actions to reduce methylmercury in fish tissue.

Water chemistry and fisheries management could be evaluated to determine whether current management practices could be modified to reduce mercury levels in the water and fish (in addition to mercury source controls). The proposed mercury control program for reservoirs is divided into two phases:

- Phase 1: For a small number of representative reservoirs, owners and operators would engage in studies and pilot tests, and potentially develop management practices.
- Phase 2: The new management practices identified by the Phase 1 studies and pilot tests could be implemented by the reservoir owners or operators in other reservoirs that have similar or appropriate characteristics.

**3.2. What should the mercury control program for reservoirs require of mines?**

See the implementation program for mines, described in section 2, above. The same option could apply and an additional option could be:

A strategy to identify and prioritize mine sites and mining waste upstream of reservoirs for cleanup could be developed to address the large number of mines that produced and/or used mercury upstream of reservoirs).

**3.3. What should the mercury control program for reservoirs require of nonpoint source dischargers (aside from mines)?**

See implementation program for nonpoint source dischargers, described in section 2, above. The same options could be used for the mercury control program for reservoirs.

**3.4. What should the mercury control program for reservoirs require of storm water dischargers?**

See implementation program for storm water, described in section 2, above. The same options could be used for the mercury control program for reservoirs.

**3.5. What should the mercury control program for reservoirs require of municipal wastewater and industrial dischargers?** This option is different than the options for the implementation program, described above, because the TMDL calculation is based on the relative contribution of mercury from all sources to the reservoir.

Requirements could be waste load allocations in the form of mercury concentrations, derived using current, representative effluent mercury concentration data. For negligible mercury discharges, there could be minimal or no mercury control requirements and more stringent limits for larger wastewater treatment plants and industrial dischargers. There could also be facility-specific effluent mercury 'trigger' values for the purpose of ensuring that current treatment performance is maintained.

**3.6. What should the TMDL targets be for the mercury control program for reservoirs?** The TMDL targets need to protect both people and wildlife that consume locally caught fish.

The TMDL targets could be set equal to the selected water quality objectives (see section 1, above).

**3.7. What should the assimilative capacity be for the mercury control program for reservoirs?** A water body's loading capacity (assimilative capacity) represents the maximum loading of a pollutant that the water body can assimilate without exceeding water quality objectives.

The assimilative capacity for reservoirs could be set at no detectable methylmercury [annual geometric mean] in the water column at a detection limit of 0.009 ng/L. At this water column concentration, 90%–99% of reservoirs are predicted to achieve a target of 0.2 mg/kg methylmercury in fish tissue (see 1.1b, above).

**3.8. What should the allocations be for the mercury control program for reservoirs?** TMDLs require load allocations for non-point sources (e.g. storm water runoff from non-urbanized areas) and waste load allocations for point sources (e.g. municipal wastewater and industrial dischargers).

The program could include the following allocation types for each source category:

- For non-point sources such as historic mine sites and areas with elevated levels of mercury in soils, the load allocations could be concentration-based. These proposed load allocations are in the form of inorganic mercury concentrations in suspended sediment in water.

- For point sources such as wastewater treatment facilities, the waste load allocations could be concentration-based. These proposed waste load allocations are in the form of inorganic mercury concentrations in effluent.

- For atmospherically deposited mercury, the load allocations could be load-based. These proposed allocations apply statewide and distinguish between local, global, and natural mercury emissions and deposition to California.

**3.9. What should the TMDL margin of safety be for the mercury control program for reservoirs?** TMDLs are required to have a margin of safety to account for uncertainties in the analysis.

The combination of (a) reservoir water chemistry management, (b) fisheries management, and (c) allocations assigned to mercury sources, could provide redundancy and hence an implicit margin of safety.

## 4. Additional Considerations

**4.1. How should the State Water Board recognize Native American culture and subsistence fishing as beneficial uses of waters?**

The State Water Board could establish beneficial use definitions of Native American Culture (CUL) and Subsistence Fishing (FISH) so that Regional Water Boards may designate those uses for waters located within their respective regions. The adoption of new beneficial uses contained in the proposed mercury amendment would not designate those uses to any water bodies. The definitions for the new beneficial uses would be based on input from Tribes. These definitions will also be discussed with the environmental justice community and other interested parties as well.

**4.2. Should the mercury amendment do more to address atmospheric deposition of mercury?** Substantial (i.e. 50% to 95%) reductions in California and national mercury emissions are already expected as a result of recent air regulations. However, global emissions may remain the same. Many countries are working to reduce mercury emissions and have signed a global treaty to reduce mercury pollution, but in other developing countries mercury emissions could continue to increase.

The State Water Board could work with U.S. EPA, the California Air Resources Board, and local Air Quality Management Districts to develop plans and schedules to evaluate local and statewide mercury air emissions and deposition patterns. Depending on the results of those studies, the State Water Board could work with these agencies to develop additional mercury emissions reduction programs and target any identified hotspots.

**4.3. Should the mercury amendment incorporate periodic review or revisions?** Water quality objectives are already subjected to periodic review according to the California Water Code and the Clean Water Act.

The mercury control program for reservoirs could incorporate periodic State Water Board review. At the review, the State Water Board could consider modification of targets, cleanup goals, allocations, implementation provisions and compliance schedules, or alternative regulatory approaches.

**4.4. People may continue to eat fish contaminated with mercury as well as other contaminants, by custom, need, or choice. To what extent should public exposure reduction be included in this mercury amendment?** Public exposure reduction efforts should also consider including other contaminants, such as polychlorinated biphenyls (PCBs).

a. Increase scope of the mercury amendment to include public exposure reduction (e.g. public education or advisories).

b. Do not include public exposure reduction in the scope of work of the mercury amendment. Continue working with other agencies on public exposure reduction by providing data on the levels of mercury in fish in order to generate consumption advisories.

c. Same as option "b", but keep mercury a high priority for monitoring, providing more data to support more advisories than option "b".

# VI. For More Information on the Proposed Mercury Amendment

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## Program Website

- http://www.waterboards.ca.gov/water_issues/programs/mercury/