

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

RESOLUTION NO. R2-2012-0040

CONSIDERING
A TOTAL MAXIMUM DAILY LOAD AND AN IMPLEMENTATION PLAN FOR MERCURY IN
TOMALES BAY

WHEREAS, the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board), finds that:

1. The San Francisco Bay Basin Water Quality Control Plan (Basin Plan) is the Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Resources Control Board, Office of Administrative Law and U.S. EPA, where required.
2. Under federal Clean Water Act section 303(d), the Water Board is required and authorized to establish total maximum daily loads (TMDLs) for pollutants causing impairment of water quality. Additionally, under Water Code, section 13242, the Water Board is authorized to develop an implementation program to achieve water quality objectives.
3. Tomales Bay is listed as impaired by mercury on the Clean Water Act section 303(d) list. Therefore, the Water Board is required to adopt a TMDL and associated Implementation Plan (40 C.F.R §§ 130.6(c)(1), 130.7 (2011) and Wat. Code, § 13242) to remedy the impairment.
4. A TMDL and Implementation Plan have been prepared to address the mercury-related risks to humans, aquatic life and wildlife and restore and protect water quality beneficial uses. The elements of the TMDL are set forth in Exhibit A hereto.
5. The TMDL Implementation Plan relies on actions already taken to address cleanup of the Gambonini mine site and implementation of the Walker Creek mercury TMDL, adopted by the Water Board in 2007 and approved by U.S. EPA in 2008.
6. Previous and on-going actions make any further regulatory action (i.e., any “project”) unnecessary. Therefore, this action is not a “project” that requires compliance with the California Environmental Quality Act (Pub. Res. Code § 21000 et seq.). The Water Board is not directly undertaking an activity, funding an activity, or issuing a permit or other entitlement for use (Pub. Res. Code § 21065; Cal. Code Regs., tit. 14, § 15378).
7. Health and Safety Code section 57004 requires an external peer review of the scientific basis for a rule, “...establishing a regulatory level, standard, or other requirements for the protection of public health or the environment.” This TMDL is not a “rule” as defined in section 57004. No peer review is necessary. However, the TMDL, including its numeric targets and Implementation Plan, are based on TMDLs that have been previously peer reviewed.
8. On March 12, 2012, the Water Board publicly noticed the TMDL and distributed the TMDL and supporting Staff Report in accordance with applicable State and federal laws and regulations.
9. On May 9, 2012, after a 30-day public comment period, the Water Board held a public hearing to consider the TMDL.

10. The Water Board has carefully considered all comments and testimony received, including responses thereto, on the TMDL, as well as all of the evidence in the administrative record.
11. The Resolution must be submitted for review and approval by U.S. EPA. The TMDL will become effective once approved by U.S. EPA.

NOW, THEREFORE BE IT RESOLVED THAT:

1. The Water Board adopts the TMDL as set forth in Exhibit A hereto, Summary of Tomales Bay Mercury TMDL.
2. The previous Gambonini mine site cleanup and on-going implementation of the Walker Creek mercury TMDL are an appropriate plan of implementation of the Tomales Bay mercury TMDL, will be adequate to correct the impairment, and are expected to result in attainment of water quality objectives for mercury in Tomales Bay. At this time, any further regulatory action to create another program of implementation by the Water Board would be redundant.
3. The Water Board will conduct or cause to be conducted monitoring to determine whether mercury concentrations continue to decrease in Tomales Bay. The purpose of this monitoring is to track time trends and ensure that numeric targets are met within 20 years.
4. The Water Board Executive Officer shall submit the Tomales Bay mercury TMDL to U.S. EPA for review and approval.
5. These findings shall remain valid as long as Tomales Bay attains water quality objectives no later than May 9, 2032.
6. The Water Board may amend the TMDL and Implementation Plan as necessary to ensure attainment of the water quality objectives.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on May 9, 2012.

BRUCE H. WOLFE
Executive Officer

Attachment

Exhibit A – Summary of Tomales Bay Mercury TMDL

Exhibit A

Summary of Tomales Bay Mercury TMDL¹

TMDL Element	Regulatory Provisions
Problem Statement	<p>Tomales Bay was designated as impaired (placed on the federal Clean Water Act 303(d) List) by mercury in 1996 due to concerns that drainage from the Gambonini mercury mine had probably contaminated wildlife and sport fish. The mine drains to Walker Creek, where mercury concentrations exceeded water quality objectives all the way downstream to tidal influence at Tomales Bay.</p> <p>Subsequent observations found elevated mercury levels in biota. In 2004, Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) issued an advisory against consuming any sharks or rays from Tomales Bay and limiting consumption of other sport fish and wild red rock crabs. However, commercial filter-feeding shell fish (oysters, mussels, and clams) and wild clams have levels of methylmercury that are safe for human consumption. Some species of sport fish have levels of methylmercury that are safe for 1 to 3 meals per week.</p> <p>Elevated mercury levels in biota have impaired the following beneficial uses in Tomales Bay: commercial and sport fishing (COMM), estuarine habitat (EST), marine habitat (MAR), and wildlife habitat (WILD).</p>
Numeric Targets	<p>The fish tissue target to protect humans who consume Tomales Bay fish is an average methylmercury concentration of 0.2 mg methylmercury per kg fish tissue in commonly consumed fish species. The target applies to average mercury wet weight fish tissue muscle concentrations in legal size halibut (Cal. Code of Regs., tit.14, § 28.15(b)).</p> <p>Piscivorous (fish-eating) birds are the wildlife species most sensitive to the effects of mercury in the aquatic ecosystem. The fish tissue target to protect wildlife is an average methylmercury concentration of 0.05 mg methylmercury per kg fish. This target applies to average wet weight trophic level 3 whole fish concentrations in 5–15 cm length fish.</p>
Source Analysis	<p>There are three sources of mercury to Tomales Bay:</p> <ul style="list-style-type: none"> • inactive mercury mines • watershed loading from soils and bedrock due to mercury-enriched geology, and • global atmospheric deposition <p>The Gambonini mercury mine, by far the largest source of mercury to the Bay, was cleaned up in 2000. The cleanup has been effective and has reduced mercury loads discharged from the mine by greater than 90%.</p>

¹ This table summarizes the TMDL elements supported by the Total Maximum Daily Load (TMDL) for Mercury in Tomales Bay, Staff Report, dated April 2012.

TMDL Element	Regulatory Provisions
<p>Linkage Analysis</p>	<p>Linkage analysis describes the relationships between sources of mercury and numeric targets (methylmercury concentrations in biota). This includes transport of mercury from sources to Tomales Bay, chemical transformations that make mercury more toxic (i.e., methylation of mercury), and uptake into the food web (i.e., bioaccumulation). This analysis is the basis for our estimate of the loading capacity of the Bay for mercury, our estimate of the mercury TMDL for the Bay, and allocations of loads to sources.</p> <p>The majority of mercury historically released from the Gambonini mercury mine was sediment bound and is moving downstream and entering the Bay via sediment transport processes. Notably, the largest loads of mercury are from episodic storms—infrequent storms with intense downpours. As such, this TMDL focuses on reducing suspended sediment mercury loads entering the Bay via an allocation strategy that addresses suspended sediment inputs and source reduction.</p> <p>In the aquatic environment, inorganic mercury, the form of mercury released from the Gambonini mercury mine site, can be converted to methylmercury and bioaccumulate in the food web. The geochemical conditions found in estuarine sediments are often highly conducive for producing methylmercury. These same areas also provide the food and energy needed to support estuarine aquatic ecosystems. In this linkage analysis, we assume a one-to-one relationship between reductions in methylmercury levels in prey fish and reductions in surface sediment total mercury concentrations.</p>
<p>Loading Capacity</p>	<p>The loading capacity is 0.2 mg mercury per kg suspended sediment (dry weight), bay-wide annual average.</p>
<p>TMDL and Allocations</p>	<p>The TMDL is 0.2 mg mercury per kg suspended sediment, bay-wide annual average. The TMDL is equal to the loading capacity.</p> <p>The allocations are:</p> <ul style="list-style-type: none"> • 0.2 mg mercury per kg suspended sediment, annual average, discharged from Lagunitas Creek • 0.5 mg mercury per kg suspended sediment, annual average, discharged from Walker Creek • 0.2 mg mercury per kg suspended sediment, annual average, discharged from all other tributaries to Tomales Bay • 0.7 kg mercury per year deposited directly on the Bay water surface from global atmospheric sources
<p>Margin of Safety</p>	<p>The TMDL is based on a loading capacity that is derived using conservative assumptions that provide an implicit margin of safety. The loading capacity is based on a calculation of the bay-wide average concentration of total mercury in surface sediments that excludes the mine-polluted Walker Creek Delta. That means Tomales Bay currently has the capacity to assimilate the load from the Walker Creek Delta that was excluded from the loading capacity calculation. Continued decreases in mercury levels in the Walker Creek Delta provide a further margin of safety.</p>

TMDL Element	Regulatory Provisions
Seasonal Variations and Critical Conditions	<p>We considered both seasonal variations and critical conditions in our source analysis. In the California Coast Range, almost all erosion and sediment delivery to channels occurs during the wet season, from October through May. The Gambonini mercury mine is located in the California Coast Range. Additionally, critical conditions occur during infrequent, large storms because they transport the largest loads of mercury-laden sediment from this mine (Whyte 2000). However, mine site cleanup has reduced mercury loads by 90% (Kirchner 2011) with the result that future storms will increasingly transport cleaner sediment downstream. This will result in reduced amounts of mercury entering the food web and is expected to result in further decreases in biota mercury concentrations.</p> <p>Additionally, we considered both seasonal variations and critical conditions for bioaccumulation and risk to wildlife. Specifically, we sampled prey fish during the bird breeding season, when birds are most sensitive to methylmercury.</p>
Monitoring Plan	<p>We plan to monitor to determine whether mercury concentrations continue to decrease in Tomales Bay. Monitoring is anticipated to be conducted as part of the statewide Surface Water Ambient Monitoring Program (SWAMP), depending on the availability of funds.</p> <p>The approach to monitoring is to evaluate total mercury levels in sediment at the Walker Creek Delta to verify that sediment concentrations of mercury decline. Monitoring of prey fish tissue in the Walker Creek Delta may also be conducted. Monitoring coastal sport fish on a bay-wide basis is anticipated to be conducted at ten year intervals. These data would be used to periodically evaluate risks to human health.</p>
Implementation Plan	<p>The Gambonini mercury mine is already cleaned up, and additional actions already are required for Walker Creek, downstream of the mine, as part of the Conditional Waiver of Waste Discharge Requirements for Grazing Lands in the Tomales Bay Watershed (Grazing Waiver), adopted by the Water Board in 2008, to implement two other TMDLs, the Walker Creek mercury TMDL and the Tomales Bay Watershed pathogens TMDL. Mining waste in the Walker Creek Delta is buried by sediments with lower mercury concentrations. Therefore, we do not foresee a need for actions besides those already required to address mercury in Tomales Bay.</p>