



California Regional Water Quality Control Board

San Francisco Bay Region



Alan C. Lloyd, Ph.D.
Agency Secretary

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
<http://www.waterboards.ca.gov/sanfranciscobay>

Arnold Schwarzenegger
Governor

Date: August 15, 2005

State Water Resources Control Board

Attention: Debbie Irvin, Clerk to the Board
1001 I Street
Sacramento, California 95814

SUBJECT: COMMENTS ON PROPOSED RESOLUTIONS REGARDING THE SAN FRANCISCO BAY MERCURY TOTAL MAXIMUM DAILY LOAD (TMDL)

Dear Ms. Irvin:

Attached, please find our comments concerning the three draft resolutions regarding the State Board's consideration of our proposed amendment to the Water Quality Control Plan for the San Francisco Bay Region to incorporate a San Francisco Bay mercury Total Maximum Daily Load (TMDL). We continue to recommend that the State Board adopt version 1, support the action taken by our Board, and allow restoration of San Francisco Bay for mercury to begin. After weighing the evidence in the record, our Board came to the conclusion that it is a better approach to address remaining issues about mercury, including those in versions 2 and 3, in the context of implementing the TMDL rather than waiting to resolve them prior to getting started on restoration.

As explained in our comments on the draft resolutions below, the TMDL before the State Board now is the best possible given available information and sound science. In the words of our scientific peer reviewers,

...the report articulates the state of the science with respect to mercury in San Francisco Bay and the various approaches that can be used to ameliorate the risks that mercury poses to humans and wildlife. The authors have done a good job identifying uncertainties in the data and designing a TMDL that can be adapted as additional information becomes available.

—Prof. David Sedlak

The report recognizes that there are key information gaps, but these do not justify indefinite delay in implementing a plan of action. Enough is known about the sources, fate, and effects of mercury in San Francisco Bay to justify the proposed TMDL allocations and the proposed implementation plan. The implementation plan proposed in the report is a reasonable approach to managing mercury in San Francisco Bay, while simultaneously working to fill the critical information gaps, and allows for changes to be made as new information becomes available.

—Prof. James Kirchner

Preserving, enhancing, and restoring the San Francisco Bay Area's waters for over 50 years



Recycled Paper

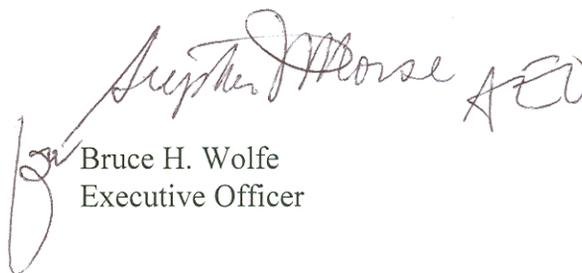
August 15, 2005

In many cases, the findings expressed in resolution versions 2 and 3 conflict with available information, and remanding the TMDL (version 2) would waste staff resources and result in no discernable environmental benefit. Therefore, we view versions 2 and 3 as having negative impacts to the Bay.

Unfortunately, additional evidentiary explanations prepared by State Board staff were placed on the State Board website on or about Monday August 8 with no notice of the posting. Since this does not provide us enough time to fully consider and rebut the evidence presented in that supporting document prior to this submittal, we will comment on that document later.

If you have any question, please contact Richard Looker at (510) 622-2451 or rlooker@waterboards.ca.gov, or Dyan Whyte at (510) 622-2441 or dwhyte@waterboards.ca.gov.

Sincerely,



Bruce H. Wolfe
Executive Officer

Enclosure

cc. w/o attachments

Celeste Cantú, State Water Board
Thomas Howard, State Water Board
Stan Martinson, State Water Board
Ken Harris, State Water Board
Joanne Cox, State Water Board
Thomas Mumley, San Francisco Bay Regional Water Board
Dyan Whyte, San Francisco Bay Regional Water Board
Richard Looker, San Francisco Bay Regional Water Board
Bill Johnson, San Francisco Bay Regional Water Board



COMMENTS ON RESOLUTIONS BEFORE STATE BOARD CONCERNING THE SAN FRANCISCO BAY MERCURY TMDL

We support adoption of Resolution version 1. We oppose version 2 because, both it ignores sound science and the large body of evidence compiled in the administrative record and, due to the delay in implementation it will cause, it delays restoration of the Bay. Version 2 relies on incomplete and inconclusive data submitted by a single stakeholder. Remanding the TMDL will not result in a TMDL that solves the mercury problem any more effectively or faster than the one already prepared. In fact, a remand would incur costs in staff time and expenditure of resources but for no water quality benefit. We do not support version 3 because it offers little in the way of water quality improvement over version 1, but we could comply with the directions if it were adopted. We now consider each version of the resolution in turn.

Version 1: Adopting the TMDL

This resolution takes the first steps toward solving a very complex and serious water quality problem. Although Water Board staff has worked extremely hard over the last several years to learn as much as possible about mercury in the San Francisco Bay system, there are still issues and concerns. We have considered all of these issues to the best of our ability in writing the staff report and proposed Basin Plan amendment. Our Board carefully considered these issues as well as stakeholder comments concerning these issues prior to adopting the TMDL.

Our scientific peer reviewers have endorsed our approach so we are confident that the plan is scientifically sound. Adopting the TMDL will take courage in the face of some scientific uncertainty, but it is the right choice. It will be decades before the mercury problem in the Bay is solved. Even if we could do the impossible and stop every bit of mercury from reaching the Bay, it would still be impaired for decades because there is a lot of mercury already there. We are eager to begin the long process of implementation and restoration. Adopting the TMDL now would let us to do so in the most efficient manner.

Version 2: Remanding the TMDL

Remanding the TMDL as proposed by version 2 would have several unfortunate consequences. It would mean that, instead of spending their time developing other TMDLs or implementing this one, Water Board staff would instead be occupied in making changes to the TMDL for nearly the next four years. This is unfortunate given that the changes required by the remand resolution will not do anything to solve the mercury problem any faster. In fact, it would delay it.

A remand would show disregard not only for the extensive staff work already devoted to this project, but also for the efforts of local stakeholders in helping to develop the TMDL. The Water Board depends greatly on a number of cooperative efforts, such as the Clean Estuary Partnership and the Regional Monitoring Program, from which over \$4.5 million per year is spent for conducting scientific studies. This support results from voluntary cooperation by a number of local stakeholders. A remand would send a message to them that it may not be worthwhile to continue these expenditures to develop scientific information that informs policy decisions, when at the end of the day, the decision will not be made based on the evidence collected.



Version 2 of the resolution contains a number of findings that contain inaccuracies, lack of evidentiary support, and misapplication of TMDL concepts. These will be discussed in the paragraphs to follow.

Finding 7a) "It is not clear whether the wasteload allocations would require municipal and industrial point source dischargers to incorporate the most effective treatment methods and pollution prevention practices practicable for their discharges."

The TMDL currently requires wasteload allocations that result in attainment of water quality standards. In addition to effluent mass limits, the implementation plan for this TMDL requires pollution prevention programs, effluent concentration triggers, and a variety of special studies as the means to achieve the wasteload allocations for wastewater sources. The Administrative Procedures Act (APA) requires that regulations be necessary. No evidence suggests that it is necessary for a TMDL to require the most costly or intricate treatment methods practicable. In fact, there is evidence in the record that eliminating wastewater discharges of mercury altogether would make virtually no difference to the recovery trajectory of the Bay.

This finding confuses measures that are the province of the implementation plan with TMDL requirements for setting allocations. Namely, the purpose of setting load allocations has nothing whatsoever to do with requiring "the most effective treatment and pollution prevention practices practicable for discharges." Rather, load allocations must be set in such a fashion as to result in the attainment of water quality standards, which we have done. Our TMDL can and does require pollution prevention as part of implementation, and our ongoing regulation of these point source dischargers will ensure that these efforts are appropriately managed and improved (Staff Report p. 75-77, BPA p. 12-14 / Admin. Rec. p. 1219-1221 and 2333-2335).

Our extensive regulation of these point source dischargers over the past 30 years has resulted in both significant reduction of mass loading and effluent concentrations for virtually all contaminants of concern, including mercury. Requiring further load reductions from wastewater, where possible, would result in costs incommensurate with their benefit. For example, if wastewater sources were simply prohibited from discharging into the Bay, our model of recovery indicates that the Bay would reach its targets in about 118 years instead of 121 years (Bruce Wolfe letter to Tom Howard, May 13, 2005). This apparent difference of three years is so much smaller than the uncertainty surrounding this calculation that a scientist would say that these numbers are indistinguishable.

From this demonstration, it should be clear that the mercury contributed to the Bay by wastewater sources is very small. How small would the contribution have to be before it was undeniably obvious that it was not worth the expense to seek further reductions? This is not just a rhetorical question, but one with which we ourselves grappled. We can do no more than point to the evidence already in the record and reassert our position that requiring further reductions in wastewater mercury loading is simply not worth the cost.

There are remaining questions about whether or not mercury discharged from wastewater sources impacts beneficial uses more than mercury from other sources. We note that it is just as likely that the converse is true. In fact, there is conflicting evidence (Bruce Wolfe letter to Tom Howard, May 13, 2005; Staff Report p. 75 and 100, Responses to Comments p. 98, Hsu and Sedlak 2003 / Admin. Rec. p. 1219, 1245, 1414, 2979-2986) about this question. In the Staff Report, we described how we are

Preserving, enhancing, and restoring the San Francisco Bay Area's waters for over 50 years



already working toward shedding light on this topic. Until we have more solid evidence that the mercury from wastewater effluent is different than the mercury from other sources and more bioavailable, there is not enough evidence to support requiring further load reductions from wastewater sources. We are loathe to require actions for which we have no compelling evidence of a resulting benefit. Our agency finds that that the cost of implementing the treatment necessary to reduce further wastewater loadings is not reasonable relative to the discernable water quality benefits derived from such requirements. We discussed this matter in the alternative analysis of the Staff Report (Staff Report p. 96-100 / Admin. Rec. 1241-1245).

Further, we have presented evidence in the record that wastewater sources are implementing practicable treatment methods and pollution prevention. The key is contemplation of the word “practicable.” “Practicable” does not mean “possible” in this context. The Water Board has exercised its judgment in determining that requiring further reductions from wastewater sources is incommensurate with the known benefits that would accrue. However, we have not abdicated our responsibility to regulate these discharges and to determine if their discharged mercury is somehow more important than that of other sources. We have explicitly called for studies in the TMDL to address relative bioavailability, and many studies are ongoing looking at this issue. The Water Board will be engaged in following these scientific developments, but, based on the information available now, our Board asserts that it is not reasonable to require further load reductions. We did consider having lower wasteload allocations for wastewater sources, and we discuss this fully in our alternatives analysis (Staff Report p. 96-100 / Admin. Rec. 1241-1245).

Assertions that Bay Area treatment facilities perform worse than their counterparts in other states are based on inadequate information. The only information of which we are aware is a small collection of wastewater data from Ohio that does not have supporting documentation necessary to make it useful for a direct comparison. We must take into consideration a greater range of factors than merely a comparison of effluent data. For instance, it is not possible for us to compare the percent of mercury removed by like facilities because we do not have information on the treatment types of the facilities from Ohio nor the type of treatment they employ nor the influent concentrations.

We also note that a large number of the Ohio data were essentially non-detect, and State Board staff inappropriately considered those non-detects as zero instead of some fraction of the detection limit. In fact, nearly 8 percent of the Ohio data are non-detects that were given a value of zero. It is also the case that the direct comparison is not valid because it appears that a variety of analytical techniques were used for the Ohio data, and that some of these techniques have unacceptably high detection limits. All of the Bay Area data were generated using consistent, low detection limit analytical techniques. We also note that there were errors in the Bay Area data set as used by State Board staff; a number of very high values that were not recognized for the typos they were. Thus, any conclusion drawn from the comparisons performed to date should be viewed as tenuous and inconclusive. We did not have time to collect the type of information we need to make the full comparison during the comment period allowed for these resolutions, but there is no compelling evidence in the record that Bay Area wastewater treatment facilities perform worse than their counterparts in other states.

The wording of this finding is inconsistent with “Whereas 5a.” The State Board requested State Board staff to determine “if the wasteload allocations require the municipal and industrial discharger to perform at **the most appropriate level** considering available pollution prevention programs and existing

Preserving, enhancing, and restoring the San Francisco Bay Area's waters for over 50 years



technology.” This is not the same question as the way it was worded in the finding where “**most effective treatment methods**” are discussed. The difference is not merely semantic. In fact, we have crafted our entire TMDL based on the most appropriate levels of performance for all discharge categories and considered all available information.

Finding 7b) “Specific monitoring requirements for methylmercury, the form in which mercury bioaccumulates, are not specified.”

This finding is false. The TMDL requires methyl mercury monitoring in fish tissue and bird eggs – the actual receptors of such mercury and therefore most closely associated with impairment. The TMDL also requires specific studies to address potential localized effects at the point of wastewater discharge. Methyl mercury monitoring of wastewater effluent is logically an aspect of investigating localized effects. However, requiring methyl mercury monitoring of wastewater sources without the context of a focused study to address specific management questions is not sound water quality policy.

The finding does not specify where these requirements should be placed. Without further guidance, a reasonable interpretation is that all discharges to the Bay should be required to monitor for methyl mercury. We do not find that this is the most direct approach for addressing the information need, which is to understand bioavailability and local effects at the point of wastewater discharge. If the finding only applies to wastewater sources, it makes no sense to require methyl mercury monitoring on discharges that represent less than 2% of the total load of mercury to the Bay without requiring such monitoring of all sources. Requiring such monitoring would be prohibitively expensive and not answer the questions we have identified as priorities in the adaptive implementation section (Staff Report p. 86-90, BPA p. 16 / Admin. Rec. p. 1231-1235 and 2337).

Finding 7c) The wasteload allocations would appear to authorize the San Francisco Bay Water Board to issue National Pollutant Discharge Elimination System (NPDES) permits that allow dischargers to discharge concentrations of mercury that contribute to excursions above the mercury narrative water quality objective.

It is not clear what it means for a discharger to contribute to excursions above the mercury **narrative** water quality objective. There is no currently established numeric interpretation of the narrative objective. In fact, the TMDL itself is the **numeric interpretation of the narrative water quality objective** and, thus, the wasteload allocations are, by definition, consistent with the narrative water quality objective since they were set in such a way as to attain all water quality standards, including the narrative objective. We also wish to point out that, taken as a group, the concentration of mercury in wastewater effluent meets even the stringent water quality objective currently in the Basin Plan. Current loading of municipal and industrial effluent is 20 kg/yr, and the total volume of effluent is about 700 million gallons per day. Dividing this mercury mass by the effluent volume and converting units results in an effective overall wastewater concentration of 0.021 ug/L, which is lower than the 0.025 ug/L objective in the Basin Plan and much lower than the 0.051 ug/L CTR objective.

This being said, because we treat all mercury entering the Bay as equally likely to contribute to the problem based on current information, **all Bay discharges currently contribute** to exceedances of narrative water quality objectives and they will until the Bay attains water quality standards. Attainment of the narrative objectives will occur over time as the allocations are reached and the Bay recovers. If no discharger can be permitted to contribute to excursions above water quality criteria, even while a

Preserving, enhancing, and restoring the San Francisco Bay Area's waters for over 50 years



TMDL is being implemented, we would have to prohibit all stormwater and wastewater flows into the Bay. This would seem to represent a major change in policy direction that would profoundly affect past, current and future TMDLs in California.

Assuming that this finding simply refers to exceedances of the Basin Plan's 0.025 ug/L 4-day average, findings 10 and 11 note that this objective will be removed and replaced most likely with a fish tissue objective.

Finding 7d) The wasteload allocations do not take into account the significant variation in effluent quality among the various dischargers and that dischargers of high quality effluent should be recognized for their efforts, while dischargers of lower quality effluent should be required to perform better.

This finding is not supported by evidence in the record. While TMDL regulations do not require that allocations be based on performance, we have done so anyway. We set individual wasteload allocations for wastewater sources using information on volume of discharge and performance (SFBRWQCB 2004b, Staff Report p. 56-58 / Admin. Rec. p. 1231-1235 and 2337). Our approach to setting individual wasteload allocations rewards plants that are performing well and pressures those facilities with poorer performance to improve. We also require a system of effluent concentration triggers to help ensure ongoing good performance from wastewater sources, and improvements in performance as population grows and flows likely increase (Staff Report p. 75 and 77, BPA p. 11-12 / Admin. Rec. p. 1219, 1221, and 2332-2333).

Finding 7e) In-Bay disposal of dredged spoils with concentrations of mercury greater than the sediment target concentrations appears to be inconsistent with the goal of restoring mercury standards in San Francisco Bay and preventing the contamination of portions of the Bay floor that are currently in attainment of standards or are less polluted, and therefore is inconsistent with CWA section 401 and CWC section 13263.

The combined action of dredging and dredged material disposal currently takes 150 kg/yr mercury out of the Bay and is thus a net loss in our TMDL model. Dredging in the Bay follows the Long Term Management Strategy (LTMS) for dredged material disposal, developed with the full support and participation of the State Board. The LTMS sets a goal that 40% of maintenance dredged material would be disposed at the deepwater ocean site; 40% would be disposed through beneficial reuse; and 20% disposed in-Bay. As the LTMS is implemented over the next ten years, less dredged material will be disposed of in the Bay and more will be disposed of out of the Bay so the amount of mercury removed from the Bay will increase to 430 kg/yr (Staff Report p. 78 / Admin. Rec. p. 1222). The TMDL specifies requirements to ensure that no contaminated dredged material is placed in the Bay. The TMDL also requires dredgers to demonstrate that their activities are accomplished in a manner that does not increase bioavailability of mercury. The LTMS strategy was developed collaboratively by USEPA, the San Francisco Bay Regional Water Board, the US Army Corps of Engineers, the San Francisco Bay Conservation and Development Commission, and the State Water Board.

Our response to this issue is already in the administrative record (Responses to Comments p. 130-134 and 99-100 / Admin. Rec. 1446-1450 and 1415-1416). We find no inconsistency with CWA § 401. The beginning of this section states:



Any applicant for a Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable waters at the point where the discharge originates or will originate, that **any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this Act** (emphasis added).

CWA § 303 is where the CWA sets forth TMDL requirements. We interpret this passage to mean that CWA § 401 permits for discharges must comply with any applicable TMDL requirements. The TMDL provides the opportunity to put all permitted and unpermitted discharges in context and determine the allocations that will enable attainment of water quality standards. Because we have established the load allocation for disposal of dredged material, 401 permits for such discharges must recognize this allocation and any applicable implementation measures set forth in the TMDL. Our interpretation of this passage is that 401 permits must be adapted to the requirements of the TMDL and not vice versa.

Similarly, we find no inconsistency with CWC § 13263. The opening passage of this section states:

The regional board, after any necessary hearing, shall prescribe requirements as to the nature of any proposed discharge, existing discharge, or material change in an existing discharge, except discharges into a community sewer system, with relation to the conditions existing in the disposal area or receiving waters upon, or into which, the discharge is made or proposed. **The requirements shall implement any relevant water quality control plans that have been adopted, and shall take into consideration the beneficial uses to be protected, the water quality objectives reasonably required for that purpose**, other waste discharges, the need to prevent nuisance, and the provisions of Section 13241 (emphasis added).

Here again, the TMDL is the plan that specifies what is required to attain water quality standards, and, therefore, CWC § 13263 can only be understood as being subordinate to the TMDL and not vice versa. Because the allocations for dredged material have been developed as part of a plan to attain water quality standards, they cannot be inconsistent with any requirements of CWC § 13263.

The material that is dredged and redeposited in the Bay is largely composed of material that is continually suspended and resuspended. An appropriate way to think about dredging and in-Bay disposal is to consider this combined process as one that redistributes sediment in the Bay, much like what happens as a result of natural processes. And the amounts moved around by dredging and in-Bay disposal are small compared to sediment resuspension due to natural factors like winds and tides. We propose to allow in-Bay disposal of dredged material in which mercury concentrations are at or below Bay ambient concentration. All dredged material containing very high concentrations of mercury must be disposed of outside the Bay. As such, as the Bay ambient concentrations decrease over time due to source control actions, the concentration of mercury in dredged material will also decrease. Dredged material has concentrations of mercury and other contaminants that reflects Bay ambient conditions. The allocation will decrease as the Bay recovers and will eventually reach the suspended sediment target concentration. In this way, the allocation is consistent with the targets.

Requiring that dredged material instantaneously meet the sediment target would not only ignore the State Board agreement to implement the LTMS strategy, but would effectively end in-Bay disposal until

Preserving, enhancing, and restoring the San Francisco Bay Area's waters for over 50 years



the Bay meets the sediment target. Most current in-Bay disposal of dredged material is from small sources of dredged material, such as maintenance of private marinas. Given the increased cost of out-of-Bay disposal, it is very likely that some small projects may be delayed or may not take place at all.

We point out that TMDL regulations do not require all sources to instantaneously meet their allocations. For example, if this were required by TMDL regulations, we would be obligated to prohibit any stormwater from entering the Bay. If this is the wish of the State Board, there are several policy, cost, and environmental implications that must be considered.

Finding 7f) It is not clear that all sources of mercury that may affect San Francisco Bay have been adequately identified, such as Bay margin sites and mines within the northern portion of the region.

No evidence in the record suggests that we have missed a substantial source of mercury. We are not aware of any evidence in the record that suggests the existence of a Bay margin site or a mine within the northern portion of the region that we have ignored. Further, because these sources have not been given a load allocation, they effectively have a load allocation of zero. Therefore, if they are discovered to be discharging to the Bay, they will be in immediate jeopardy of exceeding their load allocation. We have already explicitly addressed, considered, and resolve this issue (Staff Report p. 33 and 79, BPA p. 14 / Admin. Rec. p. 1177, 1223, and 2335).

Finding 7g) The proposed bird egg target, as adopted and corrected while acceptable as a monitoring target, cannot serve as a basis for establishing wasteload allocations because a narrative target cannot be allocated.

The bird egg target is a numeric target. It is the concentration where no effects occur, which will be less than 0.5 ppm mercury in bird eggs. The TMDL calls for studies to refine the target (Staff Report p. 38, 91, and 85, BPA p. 16 Responses to Comments p. 76 and 121 / Admin. Rec. p. 1182, 1230, 1236, 1392, 1437, and 2337). If indeed the bird egg target is, as suggested by State Board, merely a narrative target, we do not see how it could work as a monitoring target since a monitoring target would need to refer to some numeric quantity.

The proposed allocations are, in fact, based in part on the bird egg target, as they must be to ensure that they sufficiently protect wildlife and rare and endangered species. The allocations are based on the suspended sediment target, which is derived from both the fish tissue and bird egg targets. The suspended sediment target is more conservative than these targets. Whereas a 40% reduction in striped bass mercury concentrations is needed to meet the fish tissue target and a greater than 25% reduction in California least tern egg mercury concentrations is needed to meet the bird egg target, the suspended sediment target calls for a 50% reduction in sediment mercury concentrations. The fact that the suspended sediment target incorporates a factor of 2 beyond the minimum reduction needed to meet the bird egg target is consistent with the approach USEPA used for the Great Lakes Initiative to address the same issue (USFWS 2003 [p. 18-19] / Admin. Rec. p. 4742-4743).

Eliminating the numeric bird egg target removes a critical link between the sediment target and the bioaccumulation objective protecting the wildlife beneficial use. The fish tissue target alone has not been shown to protect wildlife uses so basing the allocations only on the reductions needed to reach this target



would not satisfy TMDL requirements. In other words, we would not be able to assert that the TMDL protects wildlife, including rare and endangered species, without the numeric bird egg target.

While we acknowledge that our target may not be as specific as we might like, we know that it is based on available information. The studies needed to improve this target could take years to complete. Because existing information is very limited, we believe our approach is more reasonable than adopting a very specific target that would likely need to be revised as soon as more information becomes available. In any case, the bird egg target we developed is sufficient to derive a suspended sediment target (incorporating a factor of 2 for added protection as noted). The suspended sediment target derived in part from the bird egg target was very useful in developing a reasonable allocation scheme that protects wildlife. We conferred with USFWS on the bird egg target, and they commented on earlier versions of our work. We made adjustments to respond to their comments and address their concerns. That they did not comment on our adopted approach is, to us, a tacit acceptance of our proposed bird egg target.

Finding 10) The United States Environmental Protection Agency (USEPA) has objected to the TMDL in that it is not clear whether the TMDL will result in attainment of the numeric water quality objective of 0.025 micrograms per liter (µg/L) calculated as a four-day average, which is an objective that is applicable to those portions of the San Francisco Bay that are north of the Dumbarton Bridge. The State Water Board finds that the numeric water quality objective is redundant with the existing narrative bioaccumulation objective, in that the purpose of the numeric water column objective was to prevent bioaccumulation in fish tissue.

The last sentence of this finding is incorrect. The numeric water column objective was promulgated to protect aquatic life and was based on a bioconcentration factor for Eastern oyster applied to an FDA action level in fish. Bioconcentration factors relate the concentration of a contaminant in water to the concentration in tissue. They do not account for food web effects, which are part of accounting for bioaccumulation (Responses to Comments p. 23 and 125 / Admin. Rec. p. 1339 and 1441).

Resolved 2) Directs the San Francisco Bay Water Board to evaluate effective pollution prevention practices used in other states and the pollution prevention or other appropriate programs of each discharger. The San Francisco Bay Water Board shall revise the TMDL to incorporate appropriate programs and practices into the TMDL, and require all dischargers to aggressively implement appropriate pollution avoidance practices that are most effective at eliminating or reducing mercury concentrations in effluent.

We already have complied with this resolution. The TMDL specifically requires dischargers to develop and implement effective programs to control mercury sources (BPA p. 11-12 / Admin. Rec. p. 2332-2333), so it is unnecessary to require more specific pollution prevention measures. There is no evidence in the record that suggests that we should be requiring anything more than what is in place. A lot of effort has already been spent in identifying sources of mercury to Bay Area wastewater treatment plants (see attached Bay Area Dischargers Association mercury reduction menu and Pollution Prevention Guidance and Tools for POTWs prepared by Larry Walker Associates). Wastewater dischargers have already reviewed the vast literature available regarding mercury pollution prevention (see, for example, www.epa.gov/glnpo/bnsdocs/hgsbook). While it is important that pollution prevention efforts be maintained and optimized, it is unlikely that there is some “magic bullet” mercury reduction strategy



that is in place somewhere else in the country that is not known about and being performed in the Bay Area.

Resolved 3) Directs the San Francisco Bay Water Board to evaluate any existing effective wastewater treatment technology that enhances the removal of mercury. The San Francisco Bay Water Board shall revise the TMDL to establish individual wasteload allocations. In establishing such wasteload allocations, the San Francisco Bay Water Board shall incorporate provisions that acknowledge the efforts of those point sources whose effluent quality demonstrates good performance, and require improvement by other dischargers.

The TMDL already includes individual wasteload allocations (BPA p. 6-7 / Admin. Rec. 2327-2328), so revision of the TMDL is unnecessary. In our comments regarding finding 7a we explained why seeking further reductions from wastewater sources will have no measurable water quality benefit and is therefore incommensurate with the associated cost. While efforts to improve treatment technology will potentially be beneficial for other pollutants found in effluent, such actions will not hasten recovery of the Bay with respect to mercury. Therefore, such requirements will not pass the necessity standard as mentioned previously. Our comments regarding finding 7a point out that the wastewater allocations and effluent concentration triggers were set in such a way as to provide incentive for poor performing dischargers to improve.

Resolved 4) Directs the San Francisco Bay Water Board to revise the TMDL to require inclusion in the next round of NPDES permits or in the watershed NPDES permits monitoring for, and determination of the relative proportion of, methylmercury in effluent discharges.

The TMDL already addresses uncertainty regarding the potential for wastewater discharges to contribute to bioaccumulation, so revision of the TMDL is unnecessary. Methylmercury monitoring is just a part of the more on-point requirements we have included in the BPA. Refer to our comment on finding 7b.

Resolved 5) Directs the San Francisco Bay Water Board to ensure that discharges of dredged material meet water quality standards.

The TMDL already does this. Refer to our comment on finding 7e.

Resolved 6) Directs the San Francisco Bay and Central Valley Water Boards to create a watershed legacy mercury inventory and establish a priority list for addressing these sources. The Water Boards shall also propose potential methods or strategies to remediate priority sources.

This resolution is redundant as the TMDL already identifies the priority sources in our region's watersheds and proposes potential methods or strategies to remediate these priority sources. The TMDL also identifies mines in our region likely to be mercury sources, although available information does not indicate that they are substantial mercury sources (SFBRWQCB 1998, Staff Report p. 33 / Admin. Rec. p. 1177 and 3293-3328). Nevertheless, we are addressing these sites through our existing mines program (already described in our Basin Plan) as well as the TMDL effort. By far, the largest single watershed source of mercury in our region is the New Almaden mercury mining district, and there is a



TMDL project devoted exclusively to this source. We are not aware of any evidence in the record that suggests that we have somehow missed a substantial contribution from our region's watersheds.

As for this draft resolution directing the Central Valley Water Board to take certain actions, we note that we have no control over the Central Valley Water Board.

Resolved 9) Directs the San Francisco Bay and Central Valley Water Boards to investigate ways to address public health impacts of mercury in San Francisco Bay/Delta fish, including activities that reduce actual and potential exposure of and mitigate health impacts to those people and communities most likely to be affected by mercury in San Francisco Bay-Delta caught fish, such as subsistence fishers and their families.

This resolution is redundant as these efforts are already called out in the TMDL (BPA p. 8 and 11-12 / Admin. Rec. p. 2329 and 2332-2333). As for this draft resolution directing the Central Valley Water Board to take certain actions, we note that we have no control over the Central Valley Water Board.

Resolved 10) Directs the San Francisco Bay Water Board to either develop an appropriate and allocable target that is protective of wildlife, or clarify that the existing bird-egg target is a monitoring target, and that the TMDL will be revised if results of such monitoring reveal that the beneficial uses are not being protected.

This resolution is redundant as the adaptive implementation plan for the TMDL specifies our commitment to update all targets as information dictates (Staff Report p. 91, BPA p. 16 / Admin. Rec. p. 1236 and 2337). Refer to our comment on finding 7g of this resolution.

Resolved 12) Directs the San Francisco Bay Water Board to bring a revised TMDL, consistent with this resolution, back to the State Water Board within 12 months of the date of this resolution.

It is not possible to bring the TMDL back to the State Board in 12 months. We estimate that it will take nearly four years. Some of the changes that the State Board is directing us to make may constitute substantial changes to the scientific basis of the TMDL. Even minor changes will take substantial staff effort, and the changes required by this version of the resolution will be very time-consuming. We estimate that it will take at least 24 months to complete the studies required. These studies include the following:

- A study to establish a bird egg target acceptable to the State Board or a fish tissue target that protects wildlife. Such a fish tissue target does not currently exist. There are two ways to develop the information for a target to protect wildlife. One way is to conduct a feeding study with a suitable bird species. The other is to measure mercury concentrations in prey species and use existing ecological risk work prepared by USFWS. We are in the process of collecting the prey information so we will be able to improve the target as we move forward, but it will take at least several years to gather the data, and then the information will require scientific review and approval by federal agencies. We also note that developing a fish tissue target to protect wildlife is not a trivial task as evidenced by the difficulty experienced by USEPA in demonstrating that their nationwide fish tissue target to protect human health is also protective of wildlife.



- A plan for severely restricting the in-Bay disposal of dredged material that is satisfactory to the many stakeholders and agencies party to the LTMS agreement.
- A study to further identify watershed and Bay margin mercury sources and quantify loads associated with them, if any. We already have credible information regarding these sources sufficient to develop and begin implementation of the TMDL. Of course we will be learning more about sources as we implement, and there is no benefit to waiting on this more refined information. Performing a more detailed identification of watershed and Bay margin sources and establishing their loads will take at least 2 years.

After taking two years to complete these studies and a month or more to revise the TMDL and its supporting documents accordingly, the document will be ready for scientific peer review. Based on our experience, it will take approximately three to six months to accomplish scientific peer review, respond to any comments and make necessary changes. At that point, the document will be ready for public notice, our Board approval process, and resubmittal of the TMDL and its administrative record to the State Board, which took almost nine months last time. Therefore, at the earliest, we would not be able to revise the TMDL for submission to the State Board for almost four years from the time of the remand.

There will also be time-consuming interactions with our active stakeholder community who will surely wish to participate in a second opportunity to craft the TMDL according to their interests. It is highly likely that these stakeholder interactions, combined with scarce staff resources, will mean that the process will take even longer than indicated above. And, during this time, unless additional staff resources are made available, we will not be able to devote time toward implementation of the TMDL and development of other important TMDLs. By modifying the TMDL now, rather than during the adaptive implementation process the delay in implementing the TMDL will prolong the time for the Bay to recover and will have a significant negative impact on the water quality of the Bay. Because it will take a long time for the Bay to recover and the changes envisioned in this version of the resolution will have little environmental benefit, this delay in implementation is hardly warranted.

Version 3: Adopting the TMDL with Further Directions

We oppose version 3. While this version would adopt the TMDL, it offers little in the way of improvement over version 1. We could comply with the added directions if this version were adopted, but it suffers from many of the same shortcomings we identified for version 2. Version 3 does not include version 2's finding 7 (and its many subparts), so it does not have the flaws we identified for version 2's finding 7 above. However, version 3's finding 9 is similar to version 2's finding 10, which, for the reasons we explained above, is unnecessary. Our comments regarding version 2's resolved 2, 3, 4, 5, 6, 9, and 10 all apply to version 3, so we will not repeat them here. Moreover, we note that resolved 4, 5, and 10 refer to issues addressed in version 2's finding 7, which does not appear in version 3, so no findings support these resolveds. Regarding resolved 12, we believe the 6-month time frame is unrealistic (see our comment on version 2's resolved 12 above) unless we view this simply as a status report. We would prefer to address these State Board concerns with more care, which will likely require more time. Our proposed adaptive implementation plan calls for reviewing the TMDL at five-year intervals.



Concluding Remarks

We have been working a long time on this TMDL. Getting to this point has taken six staff and over eight years of effort. If one reviews the entire administrative record, one finds that we have been grappling with all the issues identified in the State Board's resolutions and many more. As an alternative to reviewing over 5000 pages of material, we strongly urge a careful review of the Staff Report, our response to public comments, and our response to scientific peer reviewers. One will find that the evidence overwhelmingly suggests that the TMDL, in its current state, is an appropriate strategy and is scientifically sound. We have prepared the best TMDL that we can craft with the information that we have available for a very complex legacy pollutant. Restoring San Francisco Bay for mercury is not going to be accomplished simply by adopting the TMDL. If we are serious about restoration, it will entail a decades-long commitment to adaptive implementation by all stakeholders and active study and a feedback mechanism to ensure that lessons learned find their way back to public policy. We are not going to be able to prepare any TMDL for mercury that is devoid of controversy or scientific uncertainty. In the Staff Report section on adaptive implementation, there are several pages devoted to the types of information needed to make improvements in the plan. We are eager to get started down the long road of implementation and not get bogged down in making minor refinements to the TMDL that do not result in any water quality benefit and consume resources that otherwise could be spent on implementation. We urge State Board to adopt Resolution version 1 so that all stakeholders can move forward on restoring the Bay.

