Delta Methylmercury TMDL Stakeholder Group's

Adaptive Management Plan
For Implementing the
Delta Methylmercury Control Program

April 22, 2010

DRAFT

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1. Intent and Purpose

Stakeholders, representing irrigated agriculture, managed wetlands, wastewater treatment plants, municipal stormwater, environmental advocates, environmental justice advocates, community-based organizations, Central Valley Water Board staff, and State and federal agencies, were involved in a collaborative stakeholder process that contributed to the development of the proposed Basin Plan amendments and the Delta Mercury Control Program. This Adaptive Management Plan contains a repository of the concepts underlying the cooperative development of the TMDL developed by members of the Delta Mercury Control Program Stakeholder Group (Stakeholder Group) regarding the management and implementation of the Delta Methylmercury (MeHg) Total Maximum Daily Load (Delta MeHg TMDL). This Plan describes how stakeholders intend to develop and implement Phase 1 requirements. Key terms are defined in **Appendix A**.

Purpose

This Plan describes the intentions of the Stakeholder Group for implementing the Central Valley Regional Water Quality Control Board's (Water Board) Delta Mercury Control Program Basin Plan amendment (BPA) (approved **, 2010). This Plan serves the following purposes:

- Presents Guiding Principles, prepared by the Stakeholder Group, that describe how the Stakeholder Group expect the Delta MeHg TMDL to be carried out.
- Describes the phased approach for Delta MeHg TMDL implementation including a specific description of proposed adaptive management methods.
- Describes what it means to have coordinated Control Studies (as required in the BPA) and to apportion responsibility.
- Describes how the Stakeholder Group will interact with a Technical Advisory Committee (TAC) and other science specialists.
- Describes Water Board staff's roles, responsibilities and interactions with stakeholders and the TAC.

This Plan is the product of discussions and negotiations among stakeholders. Stakeholders who contributed to the development of this Plan represented irrigated agriculture, managed wetlands, municipal wastewater treatment plants, municipal stormwater, environmental advocates, environmental justice advocates, Central Valley Water Board staff, and state and federal agencies. It combines and presents the products of the full Stakeholder Group and several related topic-specific Workgroups, which included:

- Adaptive Management Framework
- National Pollutant Discharge Elimination System (NPDES) Wastewater dischargers
- NPDES Phase I Municipal Separate Storm Sewer Systems (MS4s)
- Nonpoint Sources
- Stakeholder Assurances
- Offsets

- Environmental Justice
- Memorandum of Intent

Regulatory Role and Purpose

This Plan provides non-binding guidance, suggestions, and recommendations made by the Stakeholder Group for implementing Phase 1 Delta MeHg TMDL activities (described in Section 3 below). This Plan does not describe policy or other requirements enforceable by the (Water Board). No regulation is intended or implied and no stakeholder participating in the development of this Plan is required to fulfill any proposals, guidance, and actions described herein. This Plan is superseded by all descriptions of, and mandates described in the BPA.

There are no enforceable elements to this Plan. Non-compliance with the activities and schedules contained within the Basin Plan amendment are enforceable and may result in enforcement actions. This Plan is not a "pledge" of contribution from specific stakeholders.

**[written in past tense--confirm after resolution is adopted] The Regional Board adopted a Resolution approving the Basin Plan amendment and staff reports. The Resolution contains a finding ("Whereas") referring to the stakeholder process, stakeholder development of a document to adaptively manage the Phase 1 studies, and staff support of the approach. The Resolution contains (after "Therefore be it resolved") Regional Board (1) support of stakeholder development and implementation of an "adaptive management plan", and (2) direction to staff to continue working with stakeholders in the development and implementation of the mercury control studies. The staff report includes the Stakeholder Group's Guiding Principles and references this Plan.

2. Guiding Principles

The Principles Workgroup developed the following Guiding Principles between February and May 2009. The Stakeholder Group finalized them in May 2009. These Principles represent guiding perspectives that all Delta MeHg TMDL stakeholders (dischargers, affected consumers, interest advocates, public resource trustee agencies) should support. **Appendix B** contains the Principles along with their factual underpinnings. Phases 1 and 2 of the TMDL are referred to in the Principles. Descriptions of Phases 1 and 2 are presented in Section 3 of this Plan.

1. Phase 1 studies should address both inorganic mercury (inorganic Hg) and methylmercury (MeHg) from all sources. Reasonable control options should be implemented during Phase 1 for inorganic Hg and/or MeHg.
2. Phase 1 control studies should develop knowledge for effectively controlling MeHg.
3. The Basin Plan amendment (BPA) and staff report should state the current state of knowledge of the ability to control inorganic Hg and MeHg sources to attain their load and wasteload allocations and fish tissue objectives. The TMDL source control requirements should be based on that knowledge and the results of the Phase 1 studies, and be reasonable.
4. The mercury control program should incorporate an adaptive management process.
5. The mercury control program should implement reasonable, feasible actions to address MeHg loads/production and human/wildlife exposure in the near-term. The BPA should particularly address public health impacts of mercury in 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 Delta-caught fish, such as subsistence fishers and their families.
6. The mercury control program should incorporate long-term stakeholder involvement in the control studies, Technical Advisory Committee, and upstream TMDLs.
7. The control program should create strategies, including incentives to encourage innovative actions, to address the accumulation of MeHg in fish tissue and to reduce MeHg exposure, including watershed approaches, offsets projects, and short and long-term actions that result in reducing inorganic Hg and MeHg. Innovative and creative solutions such as offsets should not substitute for reasonable actions to address local impacts.
8. The linkage analysis and fish tissue objectives and the attainability of the allocations should be re-evaluated based on the findings of Phase 1 control studies and other information. The linkage analysis, fish tissue objectives and allocations should be adjusted in Phase 2, if appropriate.
9. The implementation plan should include methods to assess the relative magnitudes and other factors of different MeHg and inorganic Hg sources, and prioritize study and control actions, if and when it is not feasible to pursue those actions simultaneously.
10. The Phase 1 studies should be subject to independent peer review by the Technical Advisory Committee.
11. The geographic scope of the Phase 1 mercury control studies should include all sources downstream of major dams. Allocations in the Delta TMDL should be given to all point and

non-point methylmercury sources within the legal Delta and Yolo Bypass, including open waters.

12. The mercury control program and other Delta projects should recognize the multiple competing and potentially conflicting interests and projects, such as habitat restoration, flood protection, water supply, and human and wildlife consumption of fish.
13. Efforts should be taken to ensure all stakeholder interests are represented in developing mercury control programs.

3. Delta Methylmercury TMDL Adaptive Management

The Delta Mercury Control Program will follow an "adaptive management" approach throughout its duration, including program initiation, data collection, technical studies, technical review, and Program revisions. The Regional Board will work with stakeholders to collaboratively design and evaluate the studies, as detailed in the BPA:

> (BPA 7) The adaptive management approach includes the formation of a Stakeholder Group(s) and a Technical Advisory Committee (TAC). Regional Water Board staff, working with the TAC and Stakeholder Group(s), will provide a Control Study Guidance Document for stakeholders to reference.
>
> Board staff shall work with the TAC and Stakeholder Group(s) to review the Control Study Workplan(s) and results.

Study results and other information will be utilized to assess methylmercury conditions in the Delta, implement mercury and methylmercury reduction requirements, and potentially revise the Basin Plan amendment. Adaptive management is a method by which uncertainty can be managed through a formal process that iteratively gains understanding through scientific evaluation, and collaboration among stakeholders, regulated and regulatory parties. In this case, uncertainty refers to control factors (and the degree or conditions of their efficacy) that increase or decrease methylmercury in process water and natural systems. It also includes uncertainty in the ability to reduce methylmercury in a human health and biologically significant amount, and uncertainty over the time frame and the cost to achieve those reductions.

Phased Approach

The mercury control program is comprised of two phases. During Phase 1 ([effective date] through [nine years after Effective Date]), dischargers and State agencies will conduct mercury and methylmercury characterization and control studies. Phase 1 includes provisions for:

- Pollution minimization programs and interim mass limits for inorganic (total) mercury point sources in the Delta and Yolo Bypass
- Actions to minimize increases in mercury and methylmercury discharged to the Delta.
- Control of sediment-bound mercury in the Delta and Yolo
- Development of a mercury exposure reduction program to reduce fish mercury exposure to humans
- Development of a mercury offset program
- Development of mercury control programs for tributaries to the Delta.

This Plan describes how the Stakeholder Group intends to implement Phase 1.

Phase 2 would start after the Regional Water Board conducts the Phase 1 Delta Mercury Control Program Review and considers amendments to the Delta Mercury Control Program. The BPA states that beginning in Phase 2, methylmercury load and waste load allocations for dischargers in the Delta and Yolo Bypass shall be met as soon as possible, but no later than 2030, unless the

Regional Water Board modifies the implementation schedule and Final Compliance Date. **[check against final].

Stakeholder Participation and Coordination

Stakeholder participation in the Control Studies could include, but not be limited to, helping fund studies, allowing property access, collecting data, conducting pilot studies, and working with other stakeholders to identify and test BMPs. Although dischargers should focus on the studies that address their own discharges, they also may choose to participate in other stakeholder activities such as outreach efforts, ambient monitoring, technical reviews, and offsets policy development.

The BPA describes the option for dischargers to collaboratively implement their Control Studies:

> (BPA 5) Control Studies can be developed through a stakeholder group approach or other collaborative mechanism, or by individual dischargers. Individual dischargers are not required to do individual studies if the individual dischargers join a collaborative study group(s).

The proposed organizational structure is portrayed in two ways. First, the Delta MeHg TMDL Stakeholder Group (Stakeholder Group) and source-type subgroups may be organized as shown in **Figure 1**. The Stakeholder Group has discussed several approaches, such as meeting in association with the Delta Tributaries Mercury Council. Stakeholder Group meetings may be conducted as a distinct component of quarterly Delta Tributaries Mercury Council meetings. Additional or separate meetings for the Stakeholder Group may be held as needed.

Participants can be self-selecting based on interest. The Stakeholder Group will strive to engage a broad variety of stakeholders—technical and policy experts, dischargers, private individuals, consultants and vendors, regulators, trustee agencies, community organizations, including environmental justice groups, public health agencies, and others. Subgroups could meet in addition to Stakeholder Group meetings, providing an opportunity to discuss subgroup-specific issues, share information, and present findings at regular Stakeholder Group meetings.

To encourage communication among stakeholders, the Stakeholder Group will perform the following functions:

- Announce Stakeholder Workgroup and Subgroup meetings to all stakeholders.
- Maintain an accessible (i.e., not password protected) web site to post working and final documents.
- Support external funding to encourage participation from a diverse set of stakeholders.

The Regional Water Board will involve the full Stakeholder Group in the selection of the Technical Advisory Committee (TAC), review of studies, and program evaluation and revision.

Second, Issue-specific Workgroups may be formed to address key issues **(Figure 2**), such as:

- Exposure reduction program
- Control studies
- Monitoring (discharge and ambient monitoring)

- Watershed issues (upstream mercury TMDLs, offsets policy)
- Legislative efforts (drafting and commenting on relative legislative bills)

Participation and level of involvement in such workgroups would be an early discussion topic for the Stakeholder Group.

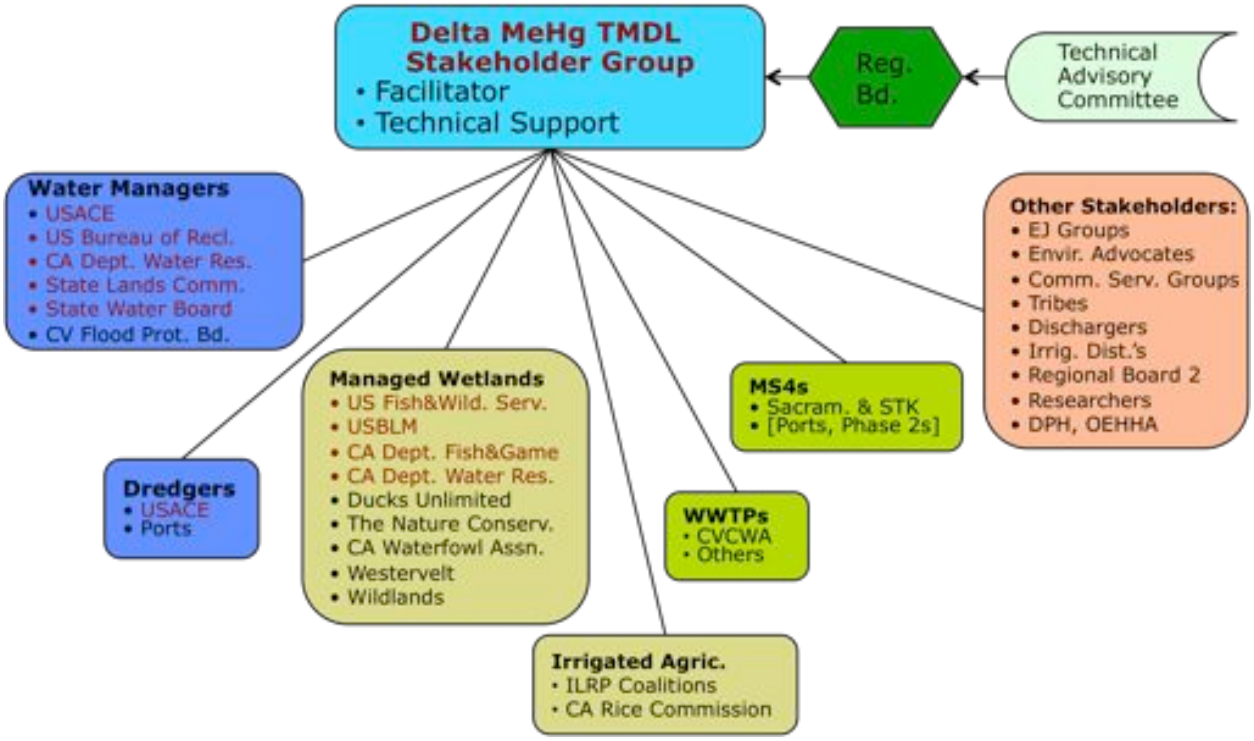

Figure 1. Stakeholder Group and Subgroup organization with regulator participation.

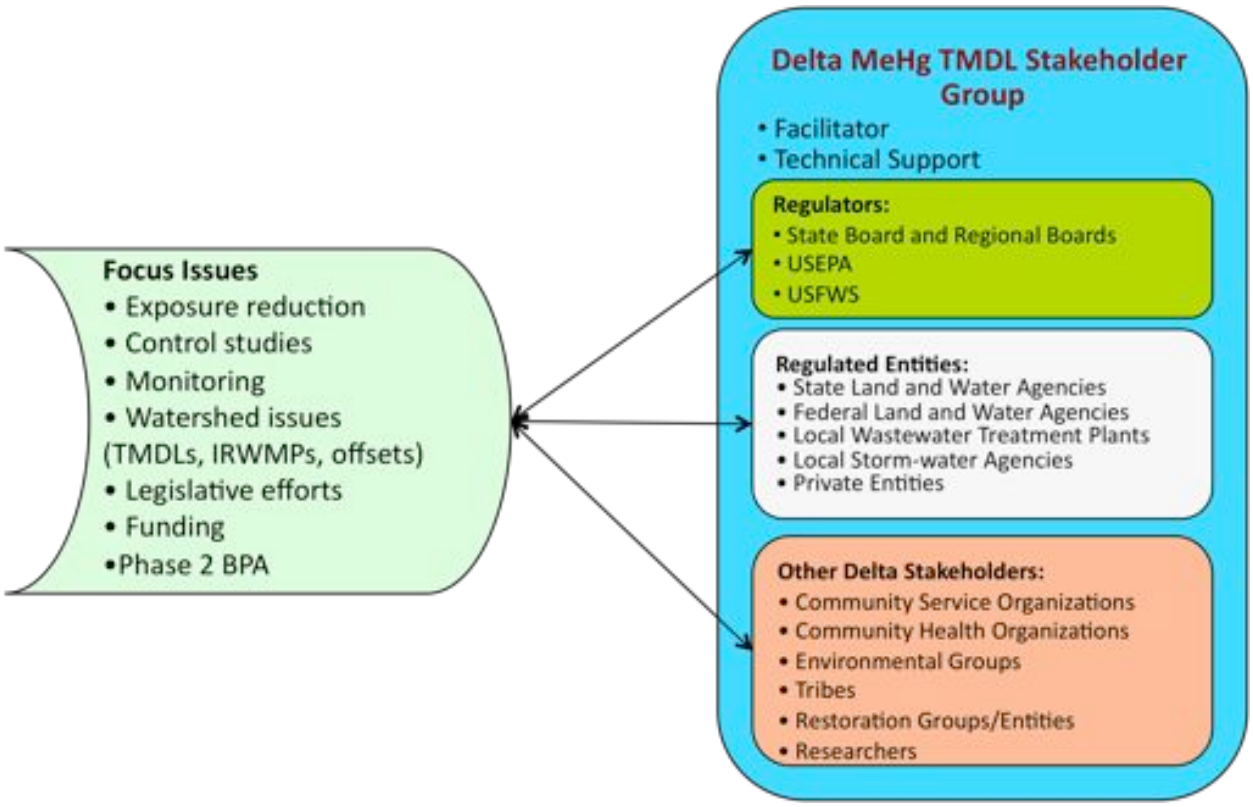

Figure 2. Issue-specific workgroup organization for addressing specific "focus issues".

The Stakeholder Group should be flexible enough to allow for growth, as the BPA states:

> (BPA 6) Dischargers to the Central Valley that are subject to the Delta Mercury Control Program but may be subject to future mercury control programs in upstream tributary watersheds are encouraged to participate in the coordinated Delta Control Studies. Dischargers in and upstream of the Delta who participate in the Control Studies will be exempt from conducting equivalent Control Studies required by future upstream mercury control programs.

This flexibility will allow for the expected growth in membership of dischargers in and upstream of the Delta who would like to avoid equivalent Control Studies for mercury control programs. Methods of coordination and communication among Subgroups are described next.

Coordination and Communication Methods for Point Source Dischargers

"Point source dischargers" refers to dischargers regulated by National Pollutant Discharge Elimination System (NPDES) permits. This source type includes municipalities managing their stormwater runoff, municipal wastewater treatment plants, power plants, and fish hatcheries.

Municipal Wastewater Treatment Facilities (POTWs)

The Central Valley Clean Water Association is a member-funded organization of municipal wastewater treatment agencies or Publically-Owned Treatment Works (POTWs) in the Central Valley. Most—although not all—POTWs in the Delta and its watershed are CVCWA members. The CVCWA Executive Officer and contractors maintain contact information and regularly communicate with member programs. CVCWA's Water Committee, Delta Subcommittee, and

Methylmercury TMDL Subcommittee members meet approximately every two months. It is likely that the latter subcommittee, or a new special project organized under CVCWA, will lead the POTW efforts to implement Phase 1 activities.

Municipal Stormwater Managers

Municipal stormwater programs are regulated by two "phases" of permits. "Phase I" programs managing stormwater dischargers to the Delta include the City of Stockton / County of San Joaquin (co-permitttees), the City of Sacramento / County of Sacramento (co-permittees along with other cities within the County), and the County of Contra Costa (much of which is regulated by the San Francisco Bay Regional Water Quality Control Board). These three permittees each have individual permits. The Stockton and Sacramento stormwater programs already have Mercury Plans mandated in those permits. Communication among these three municipal stormwater programs may occur individually or through a coordinated effort among themselves.

In addition, several smaller "Phase II" programs are allocated MeHg loads in the TMDL. However, these Phase II stormwater programs have no specific requirements for implementing Phase 1 of this TMDL. There is a statewide general permit to regulate Phase II MS4s. Communication among these smaller stormwater programs may occur individually or through the California Stormwater Quality Association (CASQA) Phase II subcommittee. CASQA is a statewide organization that provides a forum for discussion, education, and comment on stormwater issues.

Other Stormwater Managers

Designated industrial facilities, construction sites, and public properties (e.g., schools) are—or soon may be—regulated under statewide general permits for stormwater runoff. Requirements to control methylmercury have not been developed. Communication among these regulated dischargers may also occur through industry groups including CASQA.

Other NPDES Dischargers

Lead organizations have not been identified for other NPDES dischargers. It is possible that other NPDES Dischargers may be able to coordinate its effort with other point or non-point sources.

Coordination and Communication Methods for Wetlands and Irrigated Agriculture Dischargers

A Nonpoint Sources (NPS) Workgroup formed in late 2009 to educate and organize wetland and irrigated agriculture stakeholders regarding the Phase 1 implementation of the Delta Methylmercury TMDL. The current planning effort has been to apply for a Clean Water Act 319(h) Nonpoint Source planning grant, through which the NPS Workgroup can fund its planning efforts. There are three main stakeholder types that are participating in the planning Project:

- **Wetland and irrigated agriculture land managers** (or their representatives) considered methylmercury dischargers within the Delta: US Fish and Wildlife Service, US Bureau of Land Management, California Department of Water Resources, California Department of Fish and Game, California State Lands Commission, The Nature Conservancy, Ducks Unlimited, California Waterfowl Association, Westervelt Ecological Services, South

Delta Water Agency, San Joaquin County Resource Conservation District/San Joaquin and Delta Water Quality Coalition, Northern California Water Association, California Rice Commission.

- **Mercury researchers** who can contribute science knowledge and can lead Control Studies: US Geological Survey, CA Department of Fish and Game – Moss Landing Marine Laboratories, Office of Water Programs, Cal State University-Sacramento
- **Regulatory agencies** to provide regulatory guidance on TMDL implementation: CV-RWQCB and US EPA.

The proposed project will identify the potential management measures and potential study sites, support integrated, comparable, and coordinated development of the Control Study Workplans, and provide outreach and communications for the existing NPS Workgroup throughout the process. The 319(h) grant proposal outlines an organization as a subcommittee of the Delta Tributaries Mercury Council (DTMC). The DTMC Facilitator will provide communication through a dedicated web site and listserv. The NPS Workgroup plans to meet approximately monthly either separately or coinciding with quarterly DTMC meetings. The NPS Workgroup would be open to the public and additional wetlands and irrigated agricultural dischargers are encouraged to participate. The existing stakeholders will also provide outreach to their membership to educate their members and encourage participation in the planned-for collaborative Control Studies.

Coordination and Communication Methods for Water Managers and Dredgers

State and federal agencies are addressed specifically and differently in the BPA:

> (BPA 10) Open water allocations are assigned jointly to the State Lands Commission, the Department of Water Resources, and the Central Valley Flood Protection Board. Open water allocations apply to the methylmercury load that fluxes to the water column from sediments in open-water habitats within channels and floodplains in the Delta and Yolo Bypass…
>
> …The responsible agencies should coordinate with wetland and agricultural landowners during Phase 1 to characterize existing methylmercury discharges to open waters from lands immersed by managed flood flows and develop methylmercury control measures.

The current organizational and regulatory structures for these agencies are not ideal for collaboration, and dredging and dredge material reuse operations have additional requirements (although written as "should") to minimize increases in MeHg production.

**[need input from these individuals/entities on how they intend to participate: Mark List, Steve Mindt, Sac and Stockton ports, Sac Valley Flood Protection Board, US Bureau of Reclamation, Erik Ringelberg: need clarification on coordination with water/flood control managers, dredgers, State Lands Commission, and Delta Conservancy / Delta Stewardship Council / BDCP]

Scientific Review and Integration

The Delta MeHg TMDL implementation process relies on a robust scientific approach to identify potential problems, design and review studies to characterize / validate problems, design potential solutions, identify appropriate implementing parties to support studies and solutions.

Technical Advisory Committee

A Technical Advisory Committee (TAC) will be comprised of independent experts that would convene as needed to provide technical peer review. The primary purpose of the TAC is to provide an independent review of the Control Studies so that Board staff is not the only one informing the Board if studies and conclusions are adequate or if additional studies should be conducted. The Board will provide funding for the TAC and staff will manage the TAC contracts. Staff will take initial steps to identify TAC members, but the Stakeholder Group will have opportunities to suggest TAC members with expertise to review the studies, and to provide comments on the selected participants. TAC members need to be independent so that they can provide neutral opinions on the studies and are not tied directly to a discharger. The Executive Officer will have final approval authority of the TAC members. The TAC could be consulted after initial study plans are developed.

Phase 1 Delta Mercury Control Program Review

At the end of Phase 1, the Regional Water Board will conduct a Delta Mercury Control Program review based on the findings of the Phase 1 studies and other relevant information. The review will consider: modification of methylmercury goals, objectives, allocations and/or the Final Compliance Date; implementation of management practices and schedules for methylmercury controls; and adoption of a Mercury Offset Program. During the Phase 1 review, the Regional Water Board will consider the technical and economic feasibility of total mercury and methylmercury control methods and to minimize or avoid significant negative impacts to the environment that may results from control methods. The Phase 1 review will also reevaluate the fish tissue objectives, the linkage analysis between objectives and sources, and the attainability of the allocations. The linkage analysis, fish tissue objectives, allocations, and time schedules may be adjusted at the end of Phase 1, or subsequent program reviews, if appropriate.

4. Implementation Program

Phase 1 emphasizes studies and pilot projects to develop and evaluate management practices to control methylmercury. Phase 1 implementation actions are summarized here to suggest possible roles for stakeholders.

Preliminary Actions

Actions required in the BPA are scheduled from the Effective Date. Recognizing that the time lag between BPA approval by the Central Valley Water Board and the Effective Date could be 1-2 years, stakeholders are interested in continuing before the Effective Date to learn about mercury science, pursue funding opportunities, and affect legislative action. The Delta Tributaries Mercury Council provides this service to all interested stakeholders. Meetings are generally held quarterly in person, with web access generally available. Meeting notes and other information are available on-line at http://www.sacriver.org/issues/mercury/dtmc/. Meeting announcements and other mercury news is shared via a listserv.

Future meetings will include a standing agenda item to discuss the status of the Delta MeHg TMDL, both the approval process and any Stakeholder Group news (e.g., formation of Subgroups for Control Studies, formation of Workgroup for Exposure Reduction Program, grant funding opportunities).

The Regional Board will send an email announcement via Lyris to inform interested stakeholders about the DTMC listserv and provide a link to join the DTMC listserv.

Control Studies

Dischargers are required to develop Control Studies that identify and/or develop methylmercury and/or mercury control methods; evaluate the effectiveness, costs, and potential environmental effects of those methods; and propose implementation schedules to comply with methylmercury allocations. Guidance for developing appropriate studies is provided in **Appendix C**.

Comprehensive studies may encompass multiple Delta subareas and tributaries and may include multiple source types. If project proponents propose and conduct a comprehensive plan to evaluate management practices to minimize mercury and methylmercury discharges from similar types of projects, the Executive Officer will consider granting exemptions for those projects that are part of the larger comprehensive control study plan. Board staff will participate in any such groups formed to conduct the studies.

Yolo Bypass

The NPS workgroup could consider whether to have the Yolo Bypass as a separate entity for studies and organization since this is an area where significant wetland restoration projects are proposed. If so, develop a study plan that would characterize methylmercury production and discharge from lands immersed by managed flood flows within the Yolo Bypass and develop a 'floodplain allocation'.

New Wetlands

Proposed new wetland and wetland restoration projects will be evaluated for applicability to and incorporation in collaborative Control Studies. New projects will be included if the project will yield scientifically valid data required to evaluate management practices that minimize methylmercury discharges.

Characterization Studies

Characterization studies that *may be of interest* to stakeholders for better characterizing mercury source loads and subsequent transport and transformations include:

- Open water fate and transport
- Mineral springs
- Soil erosion
- Atmospheric deposition
- Contaminated mine site runoff
- Stream bank erosion

Seasonal discharge information is not yet available for most methylmercury sources to the Delta, but would be *required* by the source control and characterization studies proposed by the draft implementation plan described in Chapter 4 of the Proposed Basin Plan Amendment draft staff report.

Characterization Studies are *advised* for those irrigated agricultural lands and managed wetlands that discharge to subareas of the Delta that require methylmercury source reductions (Yolo Bypass, Sacramento, Mokelumne/Cosumnes, San Joaquin, and Marsh Creek subareas; Figure A43-4). Irrigated agricultural lands and managed wetlands that discharge to the Central Delta and West Delta subareas (Figure A43-4) *shall* conduct Characterization Studies only if changes are made to existing land uses that have the potential to increase ambient methylmercury levels (e.g., restoration activities that convert agricultural lands to wetlands). A comprehensive, coordinated study plan should be designed and implemented that will provide a characterization of discharges within the subarea. A coordinated study plan will ensure that characterization and control studies address the range of project wetlands types (i.e., flooded agricultural lands, seasonal wetlands, permanent wetlands, open water habitats) in these two Delta subareas to define ranges of methylation rates within acceptable bounds of uncertainty.

Those irrigated agricultural lands and managed wetlands that both discharge to subareas that require methylmercury source reductions and, per the results of completed Characterization Studies, act as a net source of methylmercury to the Yolo Bypass or Delta, also are *required* to conduct Control Studies. Within a subarea, individual dischargers do not need to complete individual studies if the Executive Officer approves a comprehensive, coordinated study plan that will provide a characterization of discharges within the subarea and will propose a coordinated plan for achieving subarea load allocations.

The Yolo Bypass is a significant source of methylmercury to the Delta. Water management agencies responsible for flooding the Yolo Bypass and landowners within the Bypass are *required* to develop and submit a comprehensive, coordinated study plan that will provide a

characterization of methylmercury production and discharge from lands immersed by managed flood flows within the Bypass. The study plan should include a coordinated plan for developing methylmercury control measures to achieve Bypass allocations.

Pollutant Minimization Programs and BMPs – NPDES Permitted Dischargers

The BPA requires all NPDES permitted dischargers to implement pollution minimization programs during Phase 1. For NPDES permitted facilities:

> (BPA 4) By [six months after Effective Date], all facilities listed in Table B shall submit individual pollutant minimization program workplans to the Regional Water Board. The dischargers shall implement their respective pollutant minimization programs within 30 days after receipt of written Executive Officer approval of the workplans. Until the NPDES permitted facility achieves compliance with its WLA during Phase 2, the discharger shall submit annual progress reports on pollution minimization activities implemented and evaluation of their effectiveness, including a summary of mercury and methylmercury monitoring results.

For urban runoff dischargers:

> MS4 dischargers listed in Table C shall implement best management practices (BMPs) to control erosion and sediment discharges consistent with their existing permits and orders with the goal of reducing mercury discharges. The Sacramento MS4 (CAS082597), Contra Costa County MS4 (CAS083313), and Stockton MS4 (CAS083470) permittees shall implement pollution prevention measures and BMPs to minimize total mercury discharges. This requirement shall be implemented through mercury reduction strategies required by their existing permits and orders. Annually, the dischargers shall report on the results of monitoring and a description of implemented pollution prevention measures and their effectiveness.

These programs will be implemented through individual NPDES permits.

Source Control – Nonpoint Source Dischargers

For nonpoint sources, the BPA requires actions during Phase 1:

> (BPA 5) During Phase 1, all nonpoint sources in the Delta and Yolo Bypass shall implement reasonable, feasible actions to reduce sediment in runoff with the goal of reducing inorganic mercury loading to the Yolo Bypass and Delta, in compliance with existing Basin Plan objectives and requirements, and Irrigated Lands Regulatory Program requirements.

This language simply refers to existing requirements, thereby not requiring any additional or new source control efforts.

Outreach / Exposure Reduction

The BPA contains the following requirement for an Exposure Reduction Program: **[update from final version]

> (BPA 13) Methylmercury dischargers in the Delta and Yolo Bypass shall participate individually, through their representatives, or through an appropriate entity, in the development and implementation of an Exposure Reduction Program to reduce mercury exposure of people who eat fish.

Objectives of the Exposure Reduction Program are to: raise community awareness around fish contamination issues among affected populations; and reduce mercury exposure to people most likely to be affected by mercury in Delta-caught fish. Details on how an effective outreach program could be developed and implemented are included in **Appendix D**.

Ambient and Compliance Monitoring

The following *compliance* monitoring requirements are included in the BPA (BPA 16-17):

- Compliance points for irrigated agriculture and managed wetlands methylmercury allocations shall be developed during the Phase 1 Control Studies.
- In conjunction with the Phase 1 Control Studies, nonpoint sources, irrigated agriculture, and managed wetlands shall develop and implement mercury and/or methylmercury monitoring, and submit monitoring reports.
- NPDES facilities' compliance points for methylmercury and total mercury monitoring are the effluent monitoring points currently described in individual NPDES permits. During Phase 1 and Phase 2, facilities listed in Table B shall conduct effluent total mercury and methylmercury monitoring starting by [one year after the Effective Date]. Monitoring frequencies shall be defined in the NPDES permits. Effluent monitoring requirements will be re-evaluated during the Delta Mercury Control Program Reviews.
- Facilities that begin discharging to surface water during Phase 1 and facilities for which effluent methylmercury data were not available at the time Table B was compiled, shall conduct monitoring.
- Compliance points and monitoring frequencies for MS4s required to conduct methylmercury and total mercury monitoring are those locations and wet and dry weather sampling periods currently described in the individual MS4 NPDES permits or otherwise determined to be representative of the MS4 service areas and approved by the Executive Officer on an MS4-specific basis.

Beginning in 2025, Regional Water Board staff will initiate *ambient fish tissue* monitoring. Staff will *recommend* that monitoring programs such as the Surface Water Ambient Monitoring Program (SWAMP), be designed with input from local consumers regarding preferred species and fishing sites. There are no provisions for ambient monitoring of mercury concentrations or loads.

Offsets and Other Policy Decisions

Regional Water Board staff will work with stakeholders during Phase 1 to develop a mercury offsets program by the end of Phase 1. Offsets policy guidance is given in **Appendix E**.

The need and benefits for a Mercury Offset program are describe in the BPA:

> (BPA 13) The intent of an offset program is to best use limited resources to maximize environmental benefits. The overall objectives for an offset program are to (1) provide more flexibility than the current regulatory system provides to improve the environment while meeting regulatory requirements (i.e., load and wasteload allocations) at a lower overall cost and (2) promote watershed-based initiatives that encourage earlier and larger load reductions to the Delta than would otherwise occur.
>
> On or before [nine years after Effective Date] the Regional Board will consider adoption of a mercury (inorganic and/or methyl) offsets program. During Phase 1, stakeholders may propose pilot offset projects for public review and Regional Board approval.

Major tributaries to the Delta are scheduled for subsequent mercury TMDLs. Because discharges from those tributaries impact the Delta, many Delta mercury stakeholders will be interested in how those upstream TMDLs are developed and implemented. The same Stakeholder Group described above (Section 3) could facilitate that participation.

Funding Strategies

[need progress on this section before the Effective Date]Funding will be needed to implement Phase 1. Stakeholders could contribute to overall TMDL / stakeholder engagement costs (e.g. TAC, facilitation, science support, etc). Funding for data collection or additional study-related expense could be provided through specially designated grants and contracts tied to specific tasks. Potential external sources of funding are summarized in **Appendix F.

Appendix A – Definitions

- **Delta Mercury Control Program Phase 1:** The Delta Mercury Control Program consists of two phases. Phase 1 is the time period after the Board adopts this Basin Plan amendment, up until the time when the Board reconsiders the entire Delta Mercury Control Program. Phase 1 contains the methylmercury study period and interim requirements for specific dischargers and sources described below. Phase 1 will last approximately 8 years from the effective date.
- **Delta Mercury Control Program Phase 2:** Phase 2 is the time period after Board re-evaluates the TMDL and this Basin Plan amendment and re-adopts a new Delta Mercury Control Program. Prior to beginning Phase 2, the Board will reconsider the TMDL, allocations, and compliance time schedules, and revise the implementation plan directing dischargers to implement mercury and/or methylmercury controls based on the Phase 1 study results.
- **Dischargers**: Sources of methylmercury load to the Delta, identified in the TMDL and ultimately responsible for attaining assigned (waste)load allocations.
- **Effective Date**: The date on which the US EPA approves the Delta Mercury Control Program. At this time, the BPA and TMDL already would have been approved by the Regional Water Board, the State Water Resources Control Board, the State's Office of Administrative Law.
- **Issue-specific Workgroup**: A workgroup formed by the Stakeholder Group to address specific issues in more detail.
- **Methylmercury source categories:** Methylmercury and mercury source categories and activities subject to this regulation include: Irrigated agricultural lands and managed wetlands, NPDES permitted facilities, urban runoff, dredging and dredge material disposal, legacy mining waste, and new flood conveyance, water management, and salinity control projects, atmospheric deposition, open water, and tributaries. Not all sources within each source category act as net sources of methylmercury. Entities that do not discharge methylmercury or do not act as a net source, and projects identified in Section I, are exempt from the methylmercury study requirements.
- **Phase 1 Implementation Plan Elements**:
  - Inorganic mercury load reductions to meet Region 2 allocation (110 kg/yr reduction)
  - Methylmercury and inorganic mercury characterization and reduction studies focused on meeting allocations
  - Methylmercury and inorganic mercury reduction actions [e.g., Cache Creek Settling Basin improvements and possibly other projects]
  - Measures to reduce methylmercury exposure for people eating contaminated Delta fish
  - Development of TMDLs for impaired waterways in the Delta's tributary watersheds
- **Phase 1 Methylmercury Control Studies** (Control Studies): Studies required of point and nonpoint source dischargers, working with other stakeholders, to evaluate existing control methods and, as needed, develop additional control methods to evaluate the feasibility of attaining an exceeding their methylmercury load and waste load allocations.

- **Stakeholder**: A stakeholder is a group or individual who has the responsibility for implementing a management action, is affected by the action, or has the ability to aid or prevent its implementation. Stakeholders include, but are not limited to, the following: land owners (e.g., irrigated agriculture and wetlands); communities affected by elevated fish mercury levels; land managers where wildlife on those lands are consuming fish with elevated mercury levels; NPDES facilities, urban storm water agencies, and local, state and federal agencies whose water and/or land management activities may cause or contribute to inorganic mercury or methylmercury discharges. Additionally, agencies such as the State Lands Commission, USEPA, and USBLM are stakeholders that will have a role in addressing a portion of the allocations. Stakeholder group(s) that form should include representatives from each of the above listed groups.
- **Stakeholder Group:** An organized, facilitated group of stakeholders, formed as a means to communicate relevant information and coordinate related activities.
- **Stakeholder Subgroup**: A subset of Stakeholder Group participants, formed to address the needs of a specific subset of stakeholders.

Appendix B – Guiding Principles

The following Guiding Principles were developed by the Principles Workgroup between February and May 2009. They were finalized by the Stakeholder Group in May 2009. These Principles represent guiding perspectives that all Delta MeHg TMDL stakeholders (dischargers, affected consumers, interest advocates, public resource trustee agencies) should support. The Principles are in **bold** text. Several of the Principles include indented factual underpinnings to support the Principle. Phases 1 and 2 of the TMDL are referred to in the Principles. Descriptions of Phases 1 and 2 are presented in Section 2 of this Plan.

1. **Phase 1 studies should address both inorganic mercury (inorganic Hg) and methylmercury (MeHg) from all sources. Reasonable control options should be implemented during Phase 1 for inorganic Hg and/or MeHg.**
   - While many dischargers of MeHg have no control over the inorganic Hg sources underpinning MeHg production, there is common commitment among the stakeholders to address both MeHg and inorganic Hg given practical control options. MeHg is the threat and common concern. There are several potential methods to reducing MeHg concentrations in ambient water: reducing the inorganic mercury that supplies methylation sites (i.e., reduce the inorganic Hg levels in Delta sediments); and managing the methylation sources themselves to reduce MeHg discharges, either by reducing the overall volume of discharge from the methylation sites or by implementing management practices to reduce the MeHg concentration in the discharge.
2. **Phase 1 control studies should develop knowledge for effectively controlling MeHg.**
   - There is limited knowledge on how to control MeHg production and discharges.
3. **The Basin Plan amendment (BPA) and staff report should state the current state of knowledge of the ability to control inorganic Hg and MeHg sources to attain their load and wasteload allocations and fish tissue objectives. The TMDL source control requirements should be based on that knowledge and the results of the Phase 1 studies, and be reasonable.**
   - The staff report should discuss how the Phase 1 studies and other information will be used to determine control strategies for inorganic Hg and MeHg and their effectiveness.
   - Some stakeholders believe that we may not know if attainability of allocations and objectives will be feasible at the end of Phase 1.
   - While reducing sources of inorganic Hg and controlling transport leads to reducing MeHg over the long term, reducing local MeHg sources and ambient concentrations can have rapid, local benefits.
   - Some stakeholders believe that source control benefits may only be realized near discharges as MeHg may not behave conservatively and that natural environmental factors may influence human efforts to control MeHg in the Delta, thus that the net environment benefits of reducing MeHg in discharges needs to be evaluated.
   - EPA reminds stakeholders that the Clean Water Act requires States to adopt water quality standards for priority toxic pollutants to protect beneficial uses including uses for the protection of human health. These water quality standards may be more stringent than

- technology-based standards. The Delta TMDLs must be designed to attain and maintain applicable health-based water quality standards for mercury and methylmercury.

4. **The mercury control program should incorporate an adaptive management process.**
5. **The mercury control program should implement reasonable, feasible actions to address MeHg loads/production and human/wildlife exposure in the near-term. The BPA should particularly address public health impacts of mercury in 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 Delta-caught fish, such as subsistence fishers and their families.**
   - State Board Resolution 2005-0060 directs the Central Valley Board to do this.
6. **The mercury control program should incorporate long-term stakeholder involvement in the control studies, Technical Advisory Committee, and upstream TMDLs.**
   - "Involvement" means development, implementation, and review.
7. **The control program should create strategies, including incentives to encourage innovative actions, to address the accumulation of MeHg in fish tissue and to reduce MeHg exposure, including watershed approaches, offsets projects, and short and long-term actions that result in reducing inorganic Hg and MeHg. Innovative and creative solutions such as offsets should not substitute for reasonable actions to address local impacts.**
   - MeHg contamination of fish is a common concern and causes disproportionate harm to some vulnerable communities.
8. **The linkage analysis and fish tissue objectives and the attainability of the allocations should be re-evaluated based on the findings of Phase 1 control studies and other information. The linkage analysis, fish tissue objectives and allocations should be adjusted in Phase 2, if appropriate.**
   - The Regional Board will develop a Phase 2 TMDL staff report (peer-reviewed, open to public comment) based on the Phase 1 study results. This report would consider new information and if appropriate recommend revisions to the allocations, linkages, and fish tissue objectives. This staff report would be open to public comment and a decision on it would be made by the Board before moving forward with Phase 2.
9. **The implementation plan should include methods to assess the relative magnitudes and other factors of different MeHg and inorganic Hg sources, and prioritize study and control actions, if and when it is not feasible to pursue those actions simultaneously.**
10. **The Phase 1 studies should be subject to independent peer review by the Technical Advisory Committee.**
11. **The geographic scope of the Phase 1 mercury control studies should include all sources downstream of major dams. Allocations in the Delta TMDL should be given to all point and non-point methylmercury sources within the legal Delta and Yolo Bypass, including open waters.**
   - "Major dam" refers to the most downstream dam that has a significant effect on impeding flood flow and retaining sediment.

- The Basin Plan Amendment should clearly write out how the sum of allocations will meet the TMDL.
- Regional Board staff will be developing TMDLs for Delta tributaries during Phase 1. Regional Board staff will continue to develop TMDLs upstream of the dams.
- It is not the intent of this Principle to limit upstream beneficial studies and projects.
- The State of CA (State Lands Commission and DWR) owns and manages lands and waters of the state that contribute to MeHg loads.
- The Basin Plan Amendment should provide guidance on how to write interim limits for NPDES permittees tributary to the Delta.

12. The mercury control program and other Delta projects should recognize the multiple competing and potentially conflicting interests and projects, such as habitat restoration, flood protection, water supply, and human and wildlife consumption of fish.

- The intent of the control program is not to prevent otherwise beneficial actions such as wetlands development.

13. Efforts should be taken to ensure all stakeholder interests are represented in developing mercury control programs.

Appendix C – Control Studies Guidance

This guidance material provides an overview of potential control studies that would be planned and implemented by stakeholders designated as sources of methylmercury in the Delta Methylmercury TMDL. The objective of this attachment is to provide guidance with questions and examples that will help the control study proponents to design and implement effective studies. This appendix is a work in progress as of April 2010.

Source Types

Control studies are outlined and discussed in the BPA for the following source types (showing percentages of total methylmercury load to the Delta based on values in BPA Table A):

- Managed Wetlands (19%) and Irrigated Agriculture (2%): Dischargers include private individuals, non-profit organizations, and government (local, state and federal) land and water managers
- NPDES Permitted Facilities (4%): Facilities listed in Table B, including municipal wastewater treatment plant dischargers and power plants
- Sacramento and Stockton Stormwater Programs (<1%): The three Phase I municipal stormwater programs in the Delta (Sacramento Area, Stockton Area, Contra Costa County)
- State and Federal Agencies (16% open water) : State and Federal agencies whose projects affect the transport of mercury and the production and transport of methylmercury through the Yolo Bypass and Delta, or manage open water areas in the Yolo Bypass and Delta, including but not limited to Department of Water Resources, State Lands Commission, Central Valley Flood Protection Board, US Army Corps of Engineers and U.S. Bureau of Reclamation. Some of these agencies also manage wetlands (first bullet) and other projects (last two bullets).
- New or Changed Flood Conveyance, Water Management, and Salinity Control Projects (% undetermined) : Proposed new projects or changes to existing projects related to flood conveyance, water management, and salinity control that have the potential to increase ambient mercury and/or methylmercury levels in the Delta or Yolo Bypass. Such projects would typically be led by state or federal agencies identified above. Because a Control Study would be difficult for a yet-to-be-constructed project, the series of questions in **Attachment C-1** should be addressed.
- "Dredging and Dredge Material Reuse" sources (% undetermined): This source is not included in the Control Studies section as a source type required to conduct such a study; however, BPA lines #83-99 require essentially the same level of study. Ongoing studies for San Francisco Bay under the Long-Term Management Strategy are also addressing this source.

The BPA encourages collaborative efforts to develop and implement Control Studies:

> (BPA 5) Control Studies can be developed through a stakeholder group approach or other collaborative mechanism, or by individual dischargers.

> Individual dischargers are not required to do individual studies if the individual dischargers join a collaborative study group(s)

Also, a strategy will be needed to characterize methylmercury production and discharges from lands immersed by managed flood flows, particularly within the Yolo Bypass, and to develop a "floodplain allocation".

The representative distribution of relative loads is likely to change based on more data for dry years and at more locations. The majority of the total load, 58% from tributaries, is not addressed directly by these control studies; however, some of the control measured developed and assessed may be useful throughout the Delta's watershed.

Goals and Expectations

The Basin Plan Amendment sets the goals and expectations for control studies, including the following statements:

> (BPA 6) The Control Studies shall evaluate existing control methods and, as needed, additional control methods that could be implemented to achieve methylmercury load and waste load allocations. The Control Studies shall evaluate the feasibility of reducing sources more than the minimum amount needed to achieve allocations.
>
> Phase 1 studies also may include an evaluation of innovative actions, watershed approaches, offsets projects, and other short and long-term actions that result in reducing inorganic (total) mercury and methylmercury to address the accumulation of methylmercury in fish tissue and to reduce methylmercury exposure.
>
> Dischargers may evaluate inorganic (total) mercury controls as a method of controlling methylmercury discharges.
>
> Dischargers may conduct characterization studies to inform and prioritize the Control Studies. Characterization studies may include, but not be limited to, evaluations of methylmercury and total mercury concentrations and loads in source waters, receiving waters, and discharges, to determine which discharges act as net sources of methylmercury, and which land uses result in the greatest net methylmercury production and loss.
>
> Final reports for Control Studies shall include a description of methylmercury and/or inorganic (total) mercury management practices identified in Phase 1; an evaluation of the effectiveness, and costs, potential environmental effects, and overall feasibility of the control actions. Final reports shall also include proposed implementation plans and schedules to comply with methylmercury allocations.
>
> If the Control Study results indicate that achieving a given methylmercury allocation is infeasible, then the discharger, or an entity representing a discharger, shall provide detailed information on why full compliance is not achievable, what methylmercury load reduction is achievable, and an implementation plan and schedule to achieve partial compliance.

Feasibility should be judged based on costs, local and regional environmental effects, consistency with other regulatory or legal requirements, and the potential load reduction to be achieved. Developing additional control methods would only be required if existing control methods are determined to be infeasible for achieving allocations.

Phase 1 Control Study objectives include:

- Develop and evaluate management practices and control methods to reduce methylmercury from various sources, including but not limited to managed wetlands, irrigated agriculture, urban runoff, wastewater treatment plants, and within-channel sediments. Studies should evaluate the effectiveness, costs, and potential environmental impacts of the possible methylmercury management and control measures.
- Identify methylmercury sources that can be feasibly controlled by addressing methylmercury, total mercury, or both.
- Evaluate feasibility of reducing sources more than the minimum amount needed to achieve allocations, i.e., the studies should evaluate the feasibility of achieving a discharge of no detectable methylmercury, in addition to evaluating methylmercury reductions needed to meet allocations.
- Develop watershed- and/or source-specific implementation plans that identify methylmercury and inorganic mercury source reductions to meet allocations.

Control Study Elements

Each control study should include the following elements:

- Knowledge Base and Gaps Analysis: Summarize the body of scientific understanding upon which the control study will build, including the unknowns that need to be considered in the study design
- Scope: Describe the inorganic and methylmercury sources and discharges to be studied, representative study sites, existing control measures to be evaluated, and applicability of site-specific study results to other dischargers of this source type; identify ancillary conditions to be compared to baselines
- Coordination and Communication: List the entities responsible for implementing the control study work plan, including technical experts. Describe activities that will be coordinated and communicated with other stakeholders
- Methods and Protocols: Describe and reference the sampling and analytical methods to be used for the study; be SWAMP-compatible, reference web sites for details
- Funding: Estimate budget needs and identify expected funding sources for designing and implementing the control study
- Schedule and Tracking Mechanism: Describe how study progress and compliance with time schedules will be tracked
- Reporting: Document study activities and findings, participate in Stakeholder Group meetings and communications with the Technical Advisory Committee
- Adaptive Management: Develop a process to address unforeseen results

Each of these study elements is discussed in this section.

Knowledge Base and Gaps Analysis

An initial step to developing a Control Study Workplan should include an assessment of the current knowledge and identification of the major gaps in knowledge needed that the Control Studies should address.

Literature Review

Summarize previous and ongoing studies that characterize your source type and/or evaluate methylmercury or total mercury control measures. Describe how those studies are applicable (or not) to the range of conditions relevant to the source type overall in the Delta. Some existing sources include;

- Calfed Mercury Project studies: Final reports are not compiled or synthesized, but many final reports, annual reports, and published manuscripts are available. Principle investigators can also be contacted for current results.
- NPDES MeHg Data Reports: A significant amount of effluent methylmercury concentration data reported by most NPDES facilities in the Central Valley has been combined into a single database. These data have been evaluated for correlations by treatment train and other factors in a draft report. The Central Valley Clean Water Association also reviewed much of the same data for its members. A similar database from Bay Area dischargers is also available but has not been analyzed.
- CDFG/USGS Yolo Bypass studies: Ongoing research by a team of scientists indicates correlations between methylmercury concentrations and various wetland factors. Study reports will become available early in Phase 1.
- Delta MeHg TMDL web site: The RWQCB's web site references several other reports and research projects that may have useful knowledge for scoping Control Studies.
- Other: Other published literature, reports, and information relative to your source type and control studies.

Discharge Characterization

Characterizing current discharges based on more recent datasets available since loads were estimated for the TMDL may be useful for the Control Studies. Some control studies may need to collect this data. The following information in particular may be useful:

- Concentrations and loads of methylmercury and total mercury (1) in supply waters and (2) discharged to Delta waterways. Identify sources that act as sources of total mercury (that is, that discharge at elevated concentrations) and sources of methylmercury (that is, the discharge is greater than the supply water).
- Temporal, spatial, and habitat variations that may impact supply and discharge methylmercury and total mercury concentrations and loads especially in the context of management activities. [Ex.: water regimes (flooding duration, depth, timing, water residence time, tidal influence, and channel configuration), vegetation/crop types and

densities, source water characterizations, soil substrate characteristics, and surface sediment mercury concentrations.]

- Identified variables that may control (1) methylmercury production and degradation on site [How does MeHg vary at different points between supply input/influent and discharge?] and (2) methylmercury loads in discharge [Why do some discharges have higher or lower methylmercury levels than other discharges of the same source type?]

Existing Control Measures

Control measures could include source reduction efforts, management practices or structural treatment controls. Include the following information to characterize existing control measures that could be tested for their ability to reduce total mercury and methylmercury in discharges:

- Classification as source reduction, management practice or treatment control
- Potential negative and positive environmental effects of control options [Ex.: conflicts with mosquito abatement, salt load, energy and greenhouse gas emissions, invasive species management practices, habitat diversity].
- Scaling factor, or portion of total load that could potentially be addressed by the control option based on the prevalence of similar sources in the Delta
- The extent that an existing management action that also reduces methylmercury is already being implemented.
- Sites where control options can be studied

Scope

The BPA provides some guidance on the outline of control study workplans:

> (BPA 6-7) Control Studies shall be implemented through Control Study Workplan(s). The Control Study Workplan(s) shall provide detailed descriptions of how methylmercury control methods will be identified, developed, and monitored, and how effectiveness, costs, potential environmental effects, and overall feasibility will be evaluated for the control methods.
>
> The Control Study Workplan(s) shall include details for organizing, planning, developing, prioritizing, and implementing the Control Studies.

These details and others that will be included in the control studies are described in this section.

Sources Types

Based on the Knowledge Base and Gap Analysis, describe and identify the sources that will be included in the Control Study. This includes stratification of the sample set by other factors (e.g., geographic subarea). Identify sources that will <u>not</u> be included and the rationale (e.g., non-representative, will use surrogate of another source type).

Prioritization

The prioritization of collaborative control studies should be defined based on a ranking of the source characterization, potential control measures, likelihood of success, and feasibility. This prioritization could be used to identify which projects get funded sooner.

Representative Study Sites

Identify the study sites that will address the source types in Section 3.2.1. For nonpoint sources, individual landowners providing study sites may remain anonymous. [Note: The nonpoint source allocations are to be met on a subarea scale, which affords individuals willing to volunteer sites a level of Safe Harbor protection.]

Flood control projects that use other lands, such as the Yolo Bypass wetlands, overlap with wetland and irrigated agricultural lands sources. Control studies should account for the contributions of flood control, water management, and other projects that dictate how land and water resources are managed.

Control Measures to be Evaluated

Identify the types of control measures that will be evaluated for each source type at each representative study site.

Identify the ancillary conditions that would be useful for a holistic evaluation of control measure costs relative to baseline conditions. For example, tracking labor, materials. infrastructure, crop yield, energy input costs associated with each control measure will aid in the cost-benefit analysis of alternatives.

Monitoring

Monitoring will be used to update allocations and quantify expected load reductions of the tested control measures. Monitoring should include:

- Source water and discharged volumes, needed to estimate mercury loads.
- Methylmercury and inorganic mercury concentrations in source waters [supply and/or influent] and discharges. Monitoring frequency would vary by source and project, considering the need to capture short-term effects from seasonal, flow, or treatment process changes.
- Related conditions (e.g., dissolved oxygen, pH, turbidity, suspended sediments, nutrients) should be monitored to characterize potential surrogate for mercury concentrations, bioavailability and removal effectiveness. Similarly, dissolved concentrations may be useful for characterizing mercury bioavailability, but the TMDL is based on unfiltered concentrations.
- Monitoring receiving waters may be useful, but is not needed as a direct output of the control study. Monitoring may include water column concentrations and/or fish tissue content, as well as other constituents. Control study proponents should also participate in the development of a regional monitoring program for the Delta. That effort will eventually take the leading role in conducting and reporting on ambient monitoring.

- Project proponents and Regional Board staff should strive to set consistent monitoring requirements for compliance with dredging, 401 permits, NPDES permits, and other regulatory programs.

Potential specific monitoring requirements are provided in **Attachment C-2**.

Holistic Assessment

Studies should include an assessment of environmental impacts on how the cost of regulating and controlling specifically for methylmercury affects other environmental benefits (e.g., lost opportunity cost to the environment if wetlands are not restored). For example, results from each discharger or discharger type should provide a graphical representation of the costs and associated benefits of various control options as shown in **Figure C-1**. Furthermore, results should be combined to demonstrate the net effect of each discharge source type's expected range of methylmercury load reductions as shown in **Figure C-2**.

Study proponents should also consider evaluating the effects on methylmercury production and discharges as a result of changes in, for example, source water or climate change.

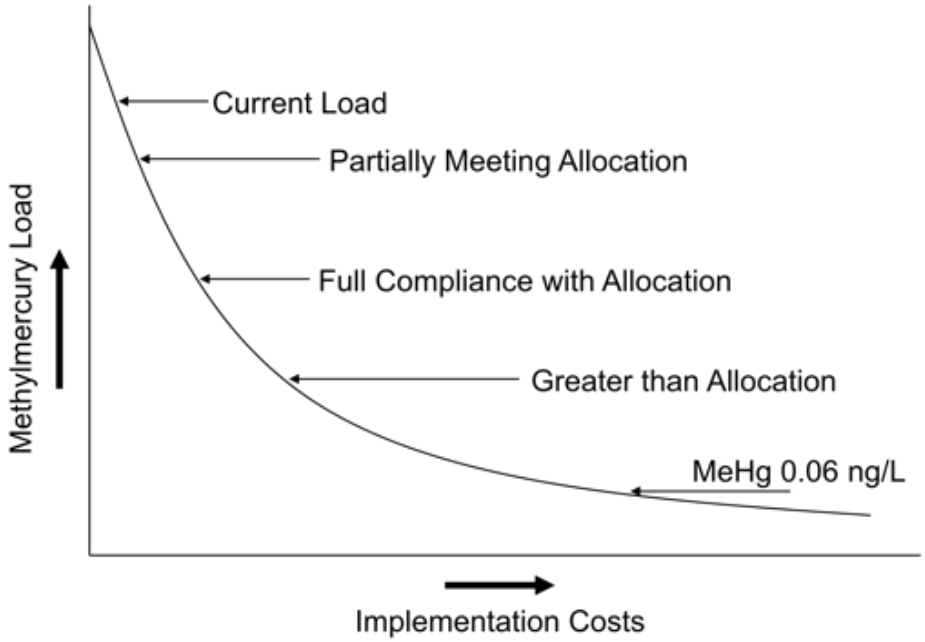

Figure C-1. Graphic example of a MeHg Control Studies cost-benefit evaluation. Scale and shape unknown.

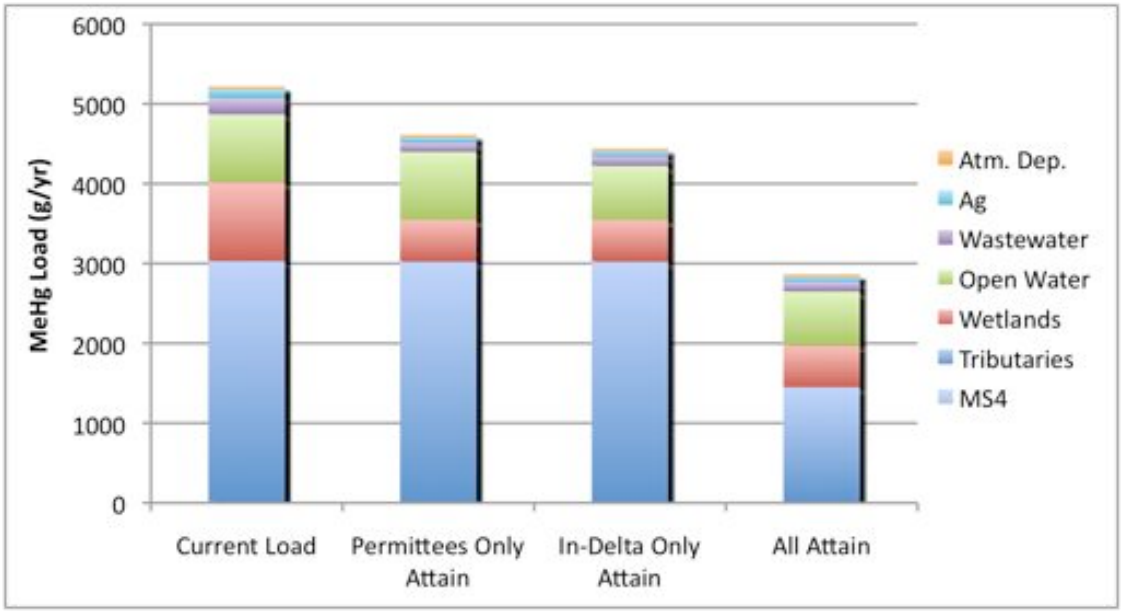

Figure C-2. Bar chart of current and allocated MeHg loads in the Delta MeHg TMDL. Bars are stacked in same order as legend.

Coordination and Communication

Control Study proponents should describe how they would coordinate and communicate effectively to implement their studies:

- Identify entities who are participating in your study and their level of effort (funds, in-kind contributions, local knowledge or access to project sites, relevant data) committed to the project.
- Identify technical experts and the expertise that they would bring to bear on the Control Study.
- Describe the process and responsibility for communicating with the RWQCB, TAC, and other TMDL stakeholders during Phase 1.

Methods and Protocols

Describe and reference the sampling and analytical methods to be followed. The Workplan could simply reference web sites and published methods where applicable. Broad criteria are that the data should be SWAMP-compatible and provide statistically significant results. See this SWAMP website for more information: http://swamp.mpsl.mlml.calstate.edu/swamp-comparability.

Funding

The anticipated budget for control studies was estimated in the TMDL staff report Appendix C as follows:

Source Type	Total Cost

Cache Creek Settling Basin	$1,600,000
NPDES Facilities	$500,000 – $1,300,000
NPDES Stormwater	$120,000 – $1,100,000
Wetlands	$730,000 – $4,700,000
Irrigated Agriculture	$290,000 – $1,400,000
New Yolo Bypass Flood Conveyance Projects	$336,000 – $3,000,000
New Water Management Projects	$540,000 – $1,300,000
Dredging Operations & Dredge Material Reuse	$300,000
TOTAL=	*$3,040,000 – $7,750,000*

For comparisons, Yolo Bypass wetlands studies have costed over $1.4 million to date and mercury research studies conducted by the San Francisco Bay RMP costed approximately $700,000 over the three-year period 2007-2009.

The Staff Report does not comment on how many sites may be necessary to sufficiently characterize control study effectiveness. Consequently, these cost estimates are only approximate and are not intended to imply a basis for judging the merit of proposed studies. Sources of funding should be stated by percentage in the Workplan, in case actual expenses differ from the budget. Potential external sources of funding are identified in a separate appendix.

Schedule and Tracking Mechanism

The BPA provides several scheduling milestones, summarized here:

Time after Effective Date[1]	**Milestone**
6 months	Submit for Executive Officer approval either: (1) a report(s) describing how dischargers and stakeholders plan to organize to develop a coordinated, comprehensive Control Study Workplan(s), or (2) a report describing how individual dischargers will develop individual Control Study Workplans.
9 months	Submit Control Study Workplans to the Regional Water Board. Within four months of submittal, the Executive Officer must determine if the Workplans are acceptable. After four months, Workplans are deemed approved and ready to implement if no written approval is provided by the Executive Officer, unless the Executive Officer provides written notification to extend the approval process.
13 months (4 months after Workplan	Regional Water Board staff and the TAC will review the workplans and provide recommendations for revising workplans if necessary.

submittal)	Within four months of Workplan submittal, the Executive Officer must determine if the Workplans are acceptable. After four months, Workplans are deemed approved and ready to implement if no written approval is provided by the Executive Officer.
Annually	Staff shall publicly report to the Regional Water Board progress of upstream mercury program development, discharger and stakeholder coordination, Control Study Workplan status, implementation of Control Studies, actions implemented or proposed to meet load and waste load allocations, and the status of the formation and activities of the TAC.
4 years	Submit report(s) to the Regional Water Board documenting progress towards complying with the Control Study Workplan(s). The TAC will review the progress reports and may recommend what additional or revised studies should be undertaken to complete the objectives of the Control Studies. The Executive Officer shall provide a comprehensive report to the Regional Water Board on Phase 1 progress, including progress of upstream mercury control program development, Control Studies, actions implemented or proposed to meet Delta Mercury Control Program load and waste load allocations, and the status and progress of the TAC.
7 years	Complete the studies and submit to the Regional Water Board Control Studies final reports. If the Executive Officer determines that dischargers are making significant progress towards developing, implementing and/or completing the Phase 1 Control Studies but that more time is needed to finish the studies, the Executive Officer may consider extending the studies' deadline. The Executive Officer may, after public notice, extend time schedules up to two years if the dischargers demonstrate reasonable attempts to secure funding for the Phase 1 studies but experience severe budget shortfalls.
7-9 years	If the Regional Water Board determines that dischargers are making significant progress towards completing the Phase 1 Control Studies but that more time is needed to finish the studies, the Regional Water Board may consider extending the time for the studies' completion.

[1] The "Effective Date" is from the date of approval of the TMDL and BPA by the USEPA.

If dischargers do not comply with Control Study implementation schedules, the Executive Officer shall consider issuing individual waste discharge requirements or ordering the production of technical reports and/or management plans.

Reporting

The BPA provides the following requirements for control study final reports:

> (BPA 6) Final reports for Control Studies shall include a description of methylmercury and/or inorganic (total) mercury management practices identified in Phase 1; an evaluation of the effectiveness, and costs, potential environmental effects, and overall feasibility of the control actions. Final reports shall also include proposed implementation plans and schedules to comply with methylmercury allocations.
>
> If the Control Study results indicate that achieving a given methylmercury allocation is infeasible, then the discharger, or an entity representing a discharger, shall provide detailed information on why full compliance is not achievable, what methylmercury load reduction is achievable, and an implementation plan and schedule to achieve partial compliance.

For each control measure, assess the results and effectiveness by addressing the following key issues:

- Effect of reducing methylmercury levels in discharges when inorganic mercury load is reduced
- Description of control measures studied and assessment of potential load reduction if broadly implemented
- Applicability of control study results to other discharges (by source type), including feasibility issues
- Suite of control measures that would enable compliance with methylmercury allocations, control measures that would result in methylmercury concentrations in discharges <0.06 ng/L, or result in no net increase of methylmercury loads (compared to supply loads)
- Implementation and operations/maintenance costs (unit and projected total costs)
- Other potential environment effects (e.g., loss of habitat acreage, quality or diversity; flood attenuation; salt loads; dissolved oxygen or ammonia levels; invasive species management or mosquito abatement constraints)
- Schedule to implement control options to comply with methylmercury allocations
- Assessment of the ability of identified control measures to comply with methylmercury allocations even if fully implemented

The final report should also include the following information:

- List of participants and their roles
- TAC comments and how they were addressed
- Whether (and how) the goals and expectations given above in Section 3 were met.

Adaptive Management

An adaptive management approach is required by the BPA as follows:

> (BPA 7) The Control Studies will be governed using an Adaptive Management approach.

The Regional Water Board commits to supporting an Adaptive Management approach. The adaptive management approach includes the formation of a Stakeholder Group(s) and a Technical Advisory Committee (TAC). Regional Water Board staff, working with the TAC and Stakeholder Group(s), will provide a Control Study Guidance Document for stakeholders to reference.

Board staff shall work with the TAC and Stakeholder Group(s) to review the Control Study Workplan(s) and results. As new information becomes available from the Control Studies or outside studies that result in redirection and/or prioritization of existing studies, dischargers may amend the Control Study Workplan(s) with Executive Officer approval.

Attachment C-1. Questions for New Projects

The following questions may help proponents of new projects to address requirements in the BPA for evaluating and mitigating methylmercury production. In addition, an "impoundment" is an additional control study candidate where 401 or other permits or re-openers for 303d mercury listed water bodies are triggered. Impoundments are engineered structures that impound water, dams (i.e., reservoirs and artificial lakes) flood control structures, other engineered features such as (drop structures) and non-native vegetation that ponds water.

New Salinity Control Projects

- What is the baseline methylmercury production rate in open channels during different seasons and flow regimes prior to project completion?
- How do salinity and/or sulfate concentrations affect methylmercury production rates and resulting ambient water column concentrations in the Delta?
- What are the direct and indirect effects of proposed flow management practices on salinity and/or sulfate concentrations and methylmercury production in the Delta?
- What are the project alternatives? If the project has not yet been constructed, how would the project alternatives change baseline conditions for MeHg and sulfate?
- If the new project would increase ambient methylmercury levels, then what management practices or upstream control actions could mitigate the methylmercury increase and be implemented?
- What are the variables that control methylmercury production and degradation in the project area?
- Are there methods to reduce methylmercury in the project area? Upstream or downstream of the project area?
- Would reducing total mercury in the source water result in reducing methylmercury levels in the project area? If so, how much of a total mercury reduction in the source water would you need to mitigate increases in ambient methylmercury caused by the project?
- What other upstream management practices could be implemented to reduce the amount of methylmercury increase caused by the project?
- Which management options would completely mitigate the amount of methylmercury increase caused by the project? Partially mitigate?
- Which management options have the least and greatest environmental impact to implement?
- Do any of the management options have effects that could counter necessary practices for salinity or pollution control (e.g., dissolved oxygen)?
- Which management options are more technically feasible?
- Which management options are more expensive?
- What are your preferred management options? Would these options completely mitigate the amount of methylmercury increase caused by the project?

- How would you design studies to evaluate MeHg reduction methods? Test projects?

New Water Management & Flood Conveyance Projects

- What are the baseline conditions (e.g., seasonal and annual methyl and total mercury concentrations and loads imported to and exported from the project area)?
- How would the new project change baseline conditions? If the project has not yet been constructed, how would the project alternatives change baseline conditions?
- If the new project would increase seasonal or annual ambient methylmercury or total mercury levels, what management measures or control actions (on-site or upstream) can be implemented to mitigate the methylmercury or total mercury increase?
- What are the factors that control total mercury levels and methylmercury production and degradation in the project area? Which factors can be modified or controlled?
- Are there methods to reduce methylmercury and/or total mercury in your project area?
- Would reducing total mercury in your source water result in reducing methylmercury levels in your project area? If so, how much of a total mercury reduction in your source water would mitigate increases in ambient methylmercury caused by your project?
- What other upstream management practices could be implemented to reduce the amount of methylmercury or total mercury increase caused by your project?
- Which management options would completely mitigate the amount of methylmercury increase caused by your project?
- Which management options have the least and greatest environmental impact?
- Which management options have the least and greatest impact on the desired outcome of the project?
- Do any of the management options have effects that could counter other necessary practices for pollution control? For example, could there be conflicts with mosquito abatement, salt, dissolved oxygen, and invasive species management practices?
- Which management options are more technically and/or economically feasible?
- What are your preferred management options? Would these options completely mitigate any increases in ambient methyl or total mercury resulting from your project?

Dredging

- What are the baseline surface sediment total mercury and methylmercury concentrations in the project area?
- What is the average total mercury concentration of the new sediment horizon? What are the expected methylmercury levels of the new horizon?
- What are dredging management practices that can be implemented to minimize increases in mercury and methylmercury?
- What are dredge disposal pond management practices that can be implemented to minimize increases in mercury and methylmercury to receiving waters?

Attachment C-2. Minimum Monitoring Requirements

The Regional Board can impose monitoring requirements under authority of California Water Code 13267. As an example, below is text from a "13267 letter" by the San Francisco Bay Regional Board requiring monitoring downstream of a mine-impacted area.

The technical report shall consist of a monitoring plan for mercury in waters downstream of mercury mines in the Guadalupe River watershed, including the following components (requirements 2–4 in the Basin Plan amendment and Section 9.9 of the Staff Report):

2. Monitoring Plan and Time Schedule for monitoring the mercury load at the points of discharge to demonstrate progress in reducing loads.
3. Monitoring Plan and Time Schedule for fish tissue mercury monitoring to assess progress in attaining targets. Fish monitoring plans must address the following questions regarding trends in fish tissue mercury concentrations:
   a. What is the inter-annual variation in fish mercury for remediation effectiveness indicators (age-1 largemouth bass in reservoirs and lakes) and target fish in creeks and the river (trophic level 3 fish 5–15 cm and >15–35 cm in length)?
   b. What is the trend in fish tissue mercury concentrations in remediation effectiveness indicators and target fish?
4. Monitoring Plan and Time Schedule for monitoring the mercury load to San Francisco Bay to assess progress in attaining the legacy and urban stormwater runoff mass load allocations assigned by the Bay mercury TMDL.

The monitoring plan must meet or exceed the above requirements (2, 3, 3a, 3b, and 4), and include questions and hypotheses to be resolved, detailed description of the sampling design, explanation of how the results are expected to resolve the questions and hypotheses, rationale for timing and frequency of sampling, sampling methods and procedures, quality assurance and quality control procedures, and data review and reporting.

The Data Collection Plan[1] for the Guadalupe River watershed mercury TMDL may be a helpful reference and example. The monitoring component of the TMDL is described in detail in Section 9 of the Staff Report, in Section 9.9 *Monitoring Program*, and related Sections 9.7 and 9.10 (*Adaptive Implementation* and *Special Studies*). The Water Board welcomes suggestions to improve upon the monitoring component described in the Staff Report, provided the suggestions satisfy requirements 2, 3, 3a, 3b, and 4 above.

Although each party is individually responsible for monitoring and reporting, we encourage the parties to satisfy monitoring requirements 3 (fish) and 4 (loads to Bay) through a coordinated watershed monitoring program. We believe that fish mercury monitoring is best undertaken through a coordinated program, because fish integrate methylmercury over time and space. Monitoring of legacy (i.e., mercury mining waste) and urban stormwater runoff mercury discharges to San Francisco Bay is best undertaken in a coordinated fashion, because these loads to the Bay are attributable to a combination of sources and responsible parties.

We will waive monitoring requirement 2 on an individual basis for parties who both (a) return the signed commitment block at the bottom of this letter by February 15, 2010, and (b) submit the coordinated watershed monitoring plan for Water Board review no later than June 15, 2010. Individual parties who do not meet both (a) and (b) must submit an individual monitoring plan that addresses requirement 2 for discharges of mercury mining waste from their mine sites, and requirements 3 and 4 for waters downstream of their site(s) no later than June 15, 2010. We are hereby waiving requirement 2 for the Water District through June 30, 2011, because it is conducting special studies. We plan to re-issue waivers of monitoring requirement 2 to the Water District, provided it continues special studies and mercury monitoring.

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[1] Tetra Tech, Inc. 2004. *Technical Memorandum 3.2.3, Data Collection Plan*, February 20. Prepared for Santa Clara Valley Water District by Tetra Tech, Inc. April 9. Available at: valleywater.org, follow the links to Water: Watersheds-streams and floods, Watershed info & projects, Guadalupe: Guadalupe River TMDL project.

As a specific example, the State Water Resources Control Board has drafted 401 permit language for the FERC hydroelectric license #2100 for DWR's Lake Oroville Facility. The permit language includes other water quality issues such as temperature and nutrients. The language below is expected to be representative for mercury impaired water bodies:

> The State Water Board reserves the authority to require Licensee to conduct studies and, if appropriate, develop a methyl mercury management plan. If ongoing or future research and monitoring data indicate that the reservoirs or other aspects of power operations increase mercury methylation rates, the Deputy Director may require Licensee to prepare and submit for approval a study plan, including studies, to identify: (1) DWR's contribution to the methyl mercury problem; (2) potential measures to reduce the amount of methylated mercury in the waters affected by Licensee's operations, as well as to protect human health; and (3) an evaluation of the feasibility of those measures. The Deputy Director may require modifications as part of the approval, and the Licensee shall implement the study plan as approved. If, based on the results of the study plan or other information, the Deputy Director determines that that DWR has contributed to the problem and there are appropriate and feasible measures that DWR could implement to reduce methyl mercury, Licensee shall develop an implementation plan for measures to reduce mercury and submit it to the Deputy Director for approval. The Deputy Director may require modifications as part of the approval. If, within 90 days, the Deputy Director does not either act on the request for approval or identify the need for additional information or actions, the plan shall be deemed approved. Upon approval by the Deputy Director, the Licensee shall implement the mercury management plan.

Appendix D – Exposure Reduction Program

This section contains a strategy for the Exposure Reduction Program, including details on stakeholder participation in the development and implementation of the program. This appendix is a work in progress as of April 2010.

The dischargers intend to work with affected communities and public health agencies to develop and implement an effective exposure reduction program. Dischargers may work together to develop a program. It is not necessary that discharger representatives participate directly. These activities may be performed by a third party if the dischargers wish to provide funding for this purpose.

The exposure reduction program may include, but not be limited to, the following activities:

- Provide fish-consumption advice and implement educational activities with the public in multiple languages and culturally appropriate fashion, including identifying fish species that have relatively low levels of mercury;
- Plan and implement feasible ways to address public health impacts of mercury in Delta fish, including activities that reduce the actual and potential exposure of and, if possible, mitigate health impacts to those people and communities most likely to be affected by mercury in Delta fish, such as subsistence fishers and their families.
- Regularly inform the public about monitoring data and findings regarding the risks and benefits of eating Delta fish in an accessible, easy to understand and culturally appropriate fashion
- Perform special studies as needed to support exposure assessment, especially among the most impacted fish consumers, and to identify appropriate intervention strategies and evaluate their effectiveness.
- Empower youth and other community members to advocate for reducing mercury in the environment and human exposure to it.
- Establish a process whereby stakeholders (including dischargers, impacted fish consumer communities, and organizations representing these communities) periodically discuss and, if needed, re-evaluate the appropriateness of established TMDL timelines for exposure reduction action items directly affecting fish tissue mercury levels.
- Progress reports should include feedback provided by community-based organizations involved in the activities.

Appendix E – Offsets Policy Principles

The offset policy principles in this appendix are the result of six workgroup meetings between July 2009 and January 2010. Subsequent to the January 2010 meeting, additional minor edits were made to add references, remove redundant statements, and format the text.

Overall goals and objectives of an Offset Program include:

- To provide more flexibility than the current regulatory system provides, to improve the environment in a shorter timeframe, and to reduce exposure to fish consumers while meeting regulatory requirements (i.e., load and wasteload allocations) at a lower overall cost.
    - The aim is to be more holistic and creative with our resources by: (1) considering other potential environmental impacts, (2) crediting projects that provide indirect benefits, and (3) crediting based on public health benefits.
- To promote watershed-based initiatives that encourage earlier and larger load reductions to the Delta than would occur without offsets.
    - In the phased TMDL approach, (1) allocations are not applied in Phase 1 and will be re-evaluated before starting Phase 2 and (2) a general offset program will be developed in Phase 1 for evaluating specific projects.
    - Offsets could be used during Phase 1 to encourage early action by having two goals: (1) early development of a pilot program to implement projects in Phase 1, and (2) development of long-term policy for long-term compliance.

Offset Program Principles

The following principles summarize the discussion by the Offsets Workgroup during the development of the Delta Methylmercury TMDL. This text is intended to provide a foundation from which an offset program could be developed during Phase 1.

Policy Consistency

- **Offsets should be consistent with USEPA trading policy and State Board policy** [if/when it exists] yet recognize that these policies may not have anticipated the full range of potential issues.
- Offset projects should be consistent with environmental justice principles.
    - The key environmental justice principle associated with offsets is that projects and programs not result in a disproportionate impact to disadvantaged communities.
    - Environmental justice is defined in California law (Government Code section 65040.12) as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies." This is cited as a basis for many of the California Environmental Protection Agency's (CalEPA) environmental justice activities and is applicable to any Board, Department or Organization under CalEPA (such as the Regional Water Boards or Department of Toxic Substances Control (DTSC)). http://www.calepa.ca.gov/EnvJustice/. The Water Boards' draft Public Participation

Manual would contain a discussion of EJ policy. This manual will be based on the DTSC's Public Participation Manual: http://www.dtsc.ca.gov/LawsRegsPolicies/Policies/PPP/PublicParticipationManual.cfm.

  - In June 2009, the Planning and Conservation League issued the following guiding principles for water reform: http://www.pcl.org/newsletters/CalToday-June2009.pdf.
  - Executive Order No. 12898, issued by President Clinton in February 1994, for federal programs and research (http://www.gsa.gov/Portal/gsa/ep/contentView.do?contentType=GSA_BASIC&contentId=16908) is the basis for federal actions and addressing environmental justice in minority populations and low income populations. One key statement is "We will develop strategies to bring justice to Americans who are suffering disproportionately...We will develop strategies to ensure that low-income and minority communities have access to information about their environment--and that they have an opportunity to participate in shaping the government policies that affect their health and environment."
  - USEPA's policy and guidance on EJ is based in part on the Executive Order: http://www.epa.gov/compliance/resources/policies/ej/index.html. Also, tribes follow this lead, not state policy.

- **Offsets should be consistent with the assumptions and requirements upon which the TMDL is established.**

Voluntary Conditions

- Offset credits should be available to both point and nonpoint source dischargers to address their TMDL allocations.
- Offsets should be a voluntary compliance option.

Proportionality

- **Offsets should not include requirements that would leverage existing discharges as a means of forcing dischargers to bear more than their fair share of responsibility for causing or contributing to any violation of water quality standards. In this context "fair share" refers to the dischargers' proportional contribution to the impairment.** (State Board Resolution 2005-0060).
  - In this case, methylmercury load should be used as the surrogate measure of contribution to the "impairment".
- Each discharger is responsible for addressing its load and allocation. Credit ratios will be based on those constraints and sound science for establishing equivalency and a net environmental benefit.

Baseline Conditions

- Offset projects should only be credited for load reductions beyond the discharger's applicable baseline. In impaired waters with TMDLs established, the baseline would be the applicable load or wasteload allocation.

- In impaired waters *prior to* a TMDL being established, the applicable baseline for point sources should be established by their existing loads below applicable effluent limitations. The baseline for nonpoint sources should be the level of pollutant load associated with existing land uses and management practices that comply with applicable state, local or tribal regulations.
    - This principle allows offsets to occur more quickly, before upstream TMDLs have been established.
    - Approved, creditable offset projects may be grand-fathered into future TMDLs, Basin Plan Amendments and/or permits.
- Reductions beyond mandated levels (surplus) should be available for sale to other parties needing credit.
    - Some stakeholders may approve of offsets that put resources to other mercury cleanup and control projects when dischargers cannot meet their own allocations, but not of trading credits that could potentially discourage the optimization of cleanup of the watershed and could result in specific communities bearing a disproportionate pollution burden.
    - This opportunity would need to be considered within the full context of the other key Offsets Principles.

Timing and Durability

- **Offset credits should be available upon generation (i.e., when an offset project is implemented).**
    - Credits could initially be generated and used based on best professional judgment. Post-implementation monitoring could eventually be applied directly to estimate the creditable load reduction.
- **Offset credits should last long enough (i.e., not expire quickly) to encourage feasible projects.**
- Consideration should be given to offset project proponents in the event that the baseline changes or project becomes unavailable. Consideration could be implemented in terms of a compliance schedule.
    - This statement means that if a project does not produce the load reduction expected from its design, the discharger would not be immediately "out of compliance" but rather could be given a compliance schedule to identify, design and implement another project.
- Credits earned should be reflected and carried forward in future NPDES permits or other regulatory documents.
    - Future permit requirements must be based on the needs of the watershed and success in moving toward reaching the objectives of the TMDL. Permit requirements for mercury would be based on the TMDL, which reflects the current understanding of the needs of the watershed.

Measurability

- Methylmercury credits could be generated by inorganic mercury and/or methylmercury load reductions.
  - A calculation procedure for appropriately converting inorganic mercury load reductions to methylmercury credits will be needed.
  - The creditable, quantifiable units are annual methylmercury load reductions (grams/year reduction to the Delta or discharger's receiving water body).
- **Creditable load reductions achieved should be real, quantifiable, verifiable, and enforceable by the Regional Board.**
  - These characteristics are based on California Health and Safety Code, Sections 38562(d)(1), used by the CA Air Resources Board's greenhouse gas emission reduction credit banking program. However, the term "permanent" is removed because some projects may be implemented temporarily.
  - "Enforceable by the Regional Board" means that the Board could take action against a party for non-compliance with project conditions. For example, credits would be generated and recorded in annual reports; not meeting the approved project's performance standards would not generate credits and a discharger could be out of compliance with their applicable TMDL (waste)load allocation as enforced via NPDES permits or other permits.
- Projects should be credited relative to their location (i.e., other Delta tributaries versus upstream of the discharge).
  - A site-specific "location ratio" could be applied for cross-subarea crediting.
- **Alternatives to direct load credits may be developed, such as time extensions to the Final Compliance Date.**
  - Creative solutions may be more useful in the near-term, such as additional (i.e., beyond required) monitoring, control studies, or exposure reduction efforts.
  - These time extensions would be determined and granted on a project-specific basis.
  - While stakeholders recognize that the purpose of an offset program is to produce actual load reductions, this option may incentivize proactive efforts and participation, consistent with TMDL principle #7.

Net Environmental / Community Benefit

- **Offset credits should only be available to fulfill a discharger's responsibility to meet its (waste)load allocation <u>after</u> reasonable control measures and pollution prevention strategies have been implemented.**
  - Dischargers will be required to assess on-site controls in Phase 1.
- Offsets should not be allowed in cases where local human or wildlife communities bear a disparate or disproportionate pollution burden as a result of the offset.

Collaboration and Stakeholder Involvement

- Offset projects in which multiple affected stakeholders participate should be encouraged.
  - Encouraging more participants will increase administrative costs and slow implementation. Nonetheless, affected stakeholders deserve the opportunity to participate in discussions and can provide valuable knowledge.
  - Offset projects should involve impacted communities in the decision-making process, from planning through implementation, to the extent practicable.
- Individual offset projects and crediting should undergo scientific peer review, public review, and be approved by the Regional Water Board in a public process.
  - The level of effort should be appropriate for the actual project—only major projects may need scientific peer review.

Approval Process

- The Regional Board should adopt a Basin Plan Amendment for an offset program before Phase 2 of the TMDL starts. The Amendment should build off this guidance.
- Individual offset projects should be approved through Regional Board Resolution, consistent with the offset program described in the Basin Plan Amendment.
- Credits should be given based on monitoring and documenting that specific performance measures were met.

Definitions

The US Environmental Protection Agency's (USEPA) Water Quality Trading Policy (USEPA, 2003) defines trading by what it entails, but does not explicitly define trading or offsets. For the purposes of these Offsets Principles, the terms are defined as follows.

- **Water Quality Credit Trading** or **Trading** – A general term referring to any negotiated transaction of water quality credits between a buyer and a seller. Trades can occur between or among regulated entities to achieve net reductions under a (waste)load allocation, among regulated and unregulated dischargers, or among dischargers and third-party participants (non-dischargers).
- **Offsets** – Sometimes describes a trade, and sometimes describes a situation where a single discharger implements a project to obtain credits in order to permit a new discharge, or to offset a load above a cap.

The terms "trading" and "offsets" are sometimes used interchangeably to refer to a range of possible arrangements, from single-party, single-transaction projects, to multi-party, multi-transaction programs. The chosen term in any given situation may simply reflect preference (some infer trading involves trading something away), syntax (trading is a verb and the trade is a transaction, while offset can be used as a verb or as a noun to describe the creditable reductions), or convenience in consistency. Sometimes the terms are intentionally used to describe distinctly different types of credit-based markets. The term "offset" is used in these Principles consistent with current regional policy discussions.

A “buyer” purchases credits from a “seller”. A buyer applies credits against its discharged load such that the net load is below its (waste)load allocation. A seller generates creditable load reductions as the amount below its (waste)load allocation. The amount and format of the transaction could be a programmatic decision (e.g., buyers pay a set amount per unit credit via a transaction service) or they could be immaterial to the program (credits are generated based on measured results and applied against the buyer’s load).

For future discussion, stakeholders could consider a shift in mindset (and associated terminology and policy guidance) by considering incentives to focus on early/more ecosystem improvement rather than on regulatory compliance. For example, regulated dischargers could set up and pay into an “ecosystem improvement fund” based on load reduction credits needed. The fund, administered by a third party, could then fund projects that address the goal of mercury load reduction to the Delta. Such a fund/program would be consistent with the principles of an exposure reduction program in which stakeholders jointly decide how to spend a limited amount of money to optimize benefits.

Appendix F – Potential External Funding Sources

The information contained in this table is the result of various discussions and input from stakeholders between November 2009 and March 2010. It is a work in progress intended to help identify available funding for any stakeholder to apply.

Name	Description / Eligibility Criteria	Amount	Contact Information	Notes
Federal Nonpoint Source Implementation [319(h)] Grant Program	Both planning and implementation grants	<$125K for planning; <$1M for implementation	Holly Grover <hgrover@waterboards.ca.gov>	Work with the Regional Board on developing projects to be competitive; SRWP proposed
Clean Water State Revolving Fund; 604(b)/205(j)	Implementation of NPS projects or programs; development and implementation of estuary comprehensive conservation and management plan. Eligible Applicants include any city, town, district, or other public body created under state law	Continuous application low-interest loan program to fund wastewater, stormwater, NPS and estuary projects.	cleanwatersrf@waterboards.ca.gov or (916) 327-9978	The federal appropriation bill that supplies funds to the Water Board from USEPA may include provisions allowing "principal forgiveness" on the loan making it similar to a grant.
Prop 84 Stormwater Grant Program	Local public agencies for the reduction and prevention of Storm Water contamination of rivers, lakes, and streams	$82 million statewide	www.swrcb.ca.gov/water_issues/programs/grants_loans/prop84/	suspended until the state sells bonds
Prop. 84 IRWMPs	Encourages development of integrated regional strategies for management of water resources	>$1 billion	www.water.ca.gov/irwm/	Draft guidelines due 2/2010➔ DTMC could provide inter-regional forum for the many overlapping IRWM planning areas, particularly for coordinated mercury monitoring, control studies, and pilot projects. The existing structure of the SRWP/DTMC and the Sacramento Valley IRWM regional working group (coordinated by the CABY IRWM group) shows considerable capacity for undertaking regional communication and coordination

Name	Description / Eligibility Criteria	Amount	Contact Information	Notes
Cleanup and Abatement Account	Public agencies authorized to cleanup or abate waste can request funds for projects.	Varies, from judgments, fines and administrative civil liabilities		The first step is to get a Regional Board resolution supporting the project. Projects under $100,000 can be approved by the State Board Deputy Director. Projects over $100,000 must be approved by the State Water Board.
Supplemental Environmental Project	Alleged environmental polluters that settle with the US EPA usually agree to a beneficial environmental project to offset a portion of the monetary penalty.	Varies, from judgments, fines and administrative civil liabilities	Melissa Raack (US EPA): rack.melissa@epa.gov, (202) 564-7039	
Appropriations bill	Nothing determined—depends on proponents	Variable depending on state budget	Yolo County [circa 2005]; The Sierra Fund [currently]	Line item in the state or federal budget
Prop. 13 (79190(b)(v) and 79196.5(e))	Funding was made available to construct facilities to control drainage from abandoned mines that effects water quality in the bay-delta.	$17 million	Formerly CalFed, now DFG	staff person retired?
104(b)(3)	USEPA provides money to "water pollution control agencies, interstate agencies, municipalities, Indian tribes and other nonprofit institutions to promote the prevention, reduction and elimination of pollution."		Tina Yin, (415) 972-3579	Must contact Regional Coordinator (see contact) for more information.

Name	Description / Eligibility Criteria	Amount	Contact Information	Notes
Farm Bill -Environmental Quality Incentives Program (EQIP), -Wildlife Habitat Incentives Program (WHIP), -Wetlands Reserve Program (WRP), -Conservation Reserve Program (CRP)	EQIP –payments up to 75% of the incurred cost and income foregone of certain conservation measures. WHIP – The NRCS provides both technical and up to 75% of cost-share assistance to establish and improve fish and wildlife habitat. WRP –assistance (up to 100% of the cost of easement or cost-share restoration agreements) to farm owners who want to "protect, restore, and enhance wetlands on their property." CRP –assistance (technical/monetary) for farmers/ranchers to "address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner."	Varies by project and Program	• EQIP: www.nrcs.usda.gov/programs/EQIP • Tim Beard, (202) 690-2621 • WHIP: www.nrcs.usda.gov/programs/whip • Albert Cerna, (202) 720-9358 • WRP: David Howard, (202) 720-1067 • CRP: Patricia Engler, (202) 720-1836	
Prop. 50	Managed jointly between the Department of Water Resources (DWR) and State Water Resources Control Board, Proposition 50 provides funding for projects to "protect communities from drought, protect and improve water quality, and reduce dependence on imported water (in California)."	Originally $380 million	www.water.ca.gov/irwm/, but need to contact grantees	rollover funds to grantees
CA Dept. Fish & Game grants (Fisheries Restoration Grant Program)	Projects are funded based on the premise that they "restore, enhance, or protect anadromous salmonid habitat in the coastal watersheds of California."	Approximately $15 million	Tim Stevens, CDFG, tstevens@dfg.ca.gov, 707-287-4165 (??)	Fisheries Restoration Grant due by 4/8/2010. RFP found at http://www.dfg.ca.gov/fish/Administration/Grants/FRGP/Solicitation.asp

Name	Description / Eligibility Criteria	Amount	Contact Information	Notes
US EPA Source Reduction Assistance Grant Program (P2 program)	Money is provided to support source reduction and resource conservation projects to reduce/eliminate pollution sources.	$130,000 per Region	EPA Region 9: Jessica Counts-Arnold (415) 972-3288 Email: counts-arnold.jessica@epa.gov	Managed through Region 9 EPA P2 Program Office Due: 2/4/2010
Environmental Education Grants	Administered by EPA's Environmental Education Division, the Environmental Education Grant provides money to increase public awareness, knowledge, and skills for the public to protect the environment.	$15,000-$25,000 per project.	Region 9: Sharon Jang 75 Hawthorne Street (OPA-2), San Francisco, CA 94105 Email: jang.sharon@epa.gov	Due: 12/15/2009
Public Works and Development Facilities Program	The program has a fairly broad scope. Some of the funding projects include: sustainable development activities, port improvements, technology infrastructure, brownsfield redevelopment, improvement of water and sewer infrastructure, development of stormwater control mechanisms…	$240 million	Jackson Federal Building, Room 1890 915 Second Avenue Seattle, WA 98174-1001 (206) 220-7660	Administered by the US Department of Commerce – Economic Development Administration Continuous Review
CA Water Bond (2010)	The water bond proposed for the November 2010 ballot includes $ for pilot projects to remediate mercury from legacy mines.	$30 million	??	While this bond is not widely supported by environmental organizations, it is noteworthy that these funds were included in the final bill.