Basin Plan Amendment for the Development of Methylmercury Total Maximum Daily Load for the Lower American River and Lake Natoma

Stakeholder Meeting
September 16, 2010
Agenda

• Guiding Principles

• Straw proposal

• Next Steps
LAR Tools and Process

• Delta Guiding Principles
  – How can we use these?

• Straw proposal options for:
  – Numeric targets for fish tissue
  – Implementation alternatives
  – Develop load and waste load allocations

• Preliminary draft Basin Plan amendment
Key Guiding Principles

• Address both inorganic Hg and MeHg for all sources
• Be adaptive, include program review
• Include near-term actions to reduce exposure
• Recognize competing and potentially conflicting activities

Under federal law, a control program must be developed to reduce fish mercury levels
Straw Proposal

• Fish tissue targets
• Sources
• Control Options
• Phased Control Program
• CEQA
• Costs
• Allocations, margin of safety
• Monitoring
Mercury Reduction Strategy

- Reducing concentrations of methylmercury in water column to reduce fish tissue mercury concentrations.
  - Reduce discharges of MeHg
  - Reduce methylation
    - Adjust factors that control the rate of methylation production or bioaccumulation
    - Promote de-methylation
  - Reduce concentrations of THg in sediment (one factor controlling MeHg)
### Scientific Background

#### Fish Tissue Mercury Concentration Reductions After Mercury Source Controls

<table>
<thead>
<tr>
<th>Mercury Source</th>
<th>Control Measures</th>
<th>Biotic Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal and industrial discharge</td>
<td>Reduced or eliminated discharge</td>
<td>22 to 96% reductions in fish tissue</td>
</tr>
<tr>
<td></td>
<td>Natural burial or dredging of contaminated sediments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Treated groundwater or pond discharge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>River bank erosion controls</td>
<td></td>
</tr>
<tr>
<td>Atmospheric deposition</td>
<td>Reduced atmospheric mercury input by 60%</td>
<td>30% reduction in 6 years</td>
</tr>
</tbody>
</table>

Summary of Delta TMDL Table 3.2.
Scientific Background

• Lake bioaccumulation study.

• Data suggest that:
  – Largemouth bass tissue Hg concentration is correlated with sediment total mercury concentrations.
  – Other factors that were found to have relationships with LMB tissue concentrations
    • Positive: Degree of lake stratification
    • Negative: [dissolved organic carbon], [sulfate], [chlorophyll-A], and specific conductivity.
Scientific Background

Delta Subarea Aqueous MeHg vs. LMB MeHg

\[ y = 20.365x^{1.6374} \]
\[ R^2 = 0.91 \]
Scientific Background

Biosentinel Fish Tissue Mercury Concentrations and Aqueous Methylmercury Concentrations

Summarized from: Foe, 2008; SFEI, 2007; and Slotton, 2008.

Biosentinel Tissue [Hg] (ppb) vs. Aqueous [MeHg] (ng/L)

SJR Fish
Cosumnes Fish
Prospect Slough Fish
SJR H2O
Cosumnes H2O
Prospect Slough H2O

0 50 100 150 200 250 300 350 400
0 0.2 0.4 0.6 0.8 1 1.2


869
Mercury Reduction Strategy

• Reducing concentrations of methylmercury in water column to reduce fish tissue mercury concentrations.
  – Reduce discharges of MeHg
  – Reduce methylation
    • Adjust factors that control the rate of methylation production or bioaccumulation
    • Promote de-methylation
  – Reduce concentrations of THg in sediment (one factor controlling MeHg)
Possible Actions

• Inorganic mercury removal or sequestration
  – Erosion control for contaminated sediment
  – Cleanup of mine tailings adjacent to Lake Natoma or the LAR
  – Cleanup or cap contaminated sediment in lake and river bottoms

• Water management in Lake Natoma or Folsom Lake
  – Flows, water depth, diurnal fluctuation, aeration

• Reduce Hg/MeHg from Folsom Lake
• Projects in Hinkle, Alder, and Willow Creeks
• Land development- Folsom and south of Hwy 50
  – Develop plans to minimize mercury impacts from land use changes, mine tailings

• Conduct studies to identify feasible total mercury or methylmercury control options
• BMPs for methylmercury and erosion
• Other actions?
Potential agencies and entities responsible for TMDL activities

- CA Dept Parks and Recreation (Lake Natoma)
- US Bureau of Reclamation (Lake Natoma)
- Cities of Folsom, Rancho Cordova, and Sacramento (storm water runoff)
- CA Dept Fish & Game (NPDES)
- County of Sacramento Parks and Recreation (Parkway)
- CA Dept General Services (NPDES)
- Aerojet Corporation (NPDES)
- Other nonpoint sources?
Implementation

• Adaptive management approach
  – Review new information
  – Re-evaluate targets, control options, allocations, etc.
  – Revise control program to improve effectiveness

• Phased timeline
Phase 1

Methylmercury Studies:
  Yr 1: develop workplans
  Yr 2-6: conduct studies
  Yr 7: report MeHg management plans

Implement some total mercury and erosion control measures

Phase 2

Implement methylmercury and total mercury controls to meet allocations by Year 20 compliance date.
TMDL Definition

• The amount of a specific pollutant that a water body can receive and still meet water quality standards.

Also called assimilative (or loading) capacity

TMDL = wasteload allocations + load allocations

(point sources) (nonpoint sources)
LAR Assimilative Capacity:

~40-95% lower than existing conditions, depending on the fish tissue target

- 40% reduction will protect wildlife, and humans eating more than 1 meal/week of mixed trophic level fish.

- 95% reduction will protect humans eating 4 to 5 meals/week of large (500 mm) TL4 fish.
How to assign allocations?

TMDL = wasteload allocations + load allocations
(point sources) (nonpoint sources)

Each point and nonpoint source must be assigned an allocation.

Allocation options:
– same % reduction to all sources?
– variable % reduction, depending on source?
Additional BPA Staff Report Components

• CEQA evaluation of potential environmental impacts due to implementing the control program

• Cost estimates for possible implementation activities
Next Steps

• Stakeholders provide feedback on proposal by 5 October.
• Staff compiles comments and develops alternatives
• Staff drafts preliminary Basin Plan amendment text for stakeholder review at October meeting.