Appendix B – Guiding Principles - Comments

B-1	Item 1 - "all sources" - should include the watershed associated with the water bodies. For example, all lands that drain into Folsom should be included as sources of mercury. The same is true for Lake Natoma, all runoffs that reach Lake Natoma should be included as sources of mercury into the lake. "reasonable control options" – it would be helpful to define what are "reasonable" controls. Something that is reasonable for one beneficial use could be unreasonable for another beneficial use in the same watershed or water body.
B-1	Item 2 – Discuss how we intend to build up knowledge on MeHg production. Begin by mentioning that there are existing total mercury/MeHg data, sampling assessments, and reports that could be gathered to begin the phase 1 process.
B-2	Item 4 – An adaptive management process is a reasonable approach but all stakeholders need to be at the table from the beginning and not phased in based on priority. Therefore, all stakeholders in the watershed that will potentially be responsible parties should be involved early in the process; i.e., at the Phase 1 study "reconnaissance" stage. Reclamation understands that the Board's goal is to move the mercury control program upstream to the foothill reservoirs and eventually to the watershed, but that work will take place in a few years and with missed opportunities to develop a coordinated and integrated program. By approaching the program in phases and not bringing all stakeholders together at the same time, we lose another opportunity to maximize resources from all stakeholders. A control program that encompasses all stakeholders from the beginning will meet the goal of Item 6 – "… having a program that incorporates long term stakeholder involvement in the control studies …"
B-2	Item 11 – "should include all sources downstream of major dams." This does not apply for the LAR Mercury TMDL. From a report produced by D.G. Slotton (*Gold Mining Impacts on Food Chain Mercury in Northwestern Sierra Nevada Streams*, Technical Completion Report, Project Number: W-816, August 1995), foothill reservoirs respond more as sinks than sources for total and methylmercury. Bullet 3: Change this so it reflects Folsom upstream tributaries. Bullet 5: What about other public and private landowners—what are their responsibilities?
B-3	Item 12 – To add more specificity, habitat restoration also includes fishery needs – flow, temps, gravel, etc. Power operation is also an identified beneficial use for this water body and will need to be protected. Recreational activities could also be considered a beneficial use. In evaluating the level of protection needed for this mercury TMDL, all beneficial uses need to be examined with adequate discussions on the priorities and tradeoffs associated with a range of numeric targets.

Straw Proposal - Comments

Pg-1	Straw proposal bullet. A comment included in the guiding principles document related to the phase 1 studies is, "Some stakeholders believe that we may not know if attainability of allocations and objectives will be feasible at the end of Phase 1." *Included in this straw proposal then should be some reference to the uncertainty that numeric targets and implementation options would necessarily follow phase 1 studies. There may be intermediate steps in between the Phase 1 studies and the allocation process as additional information becomes available on MeHg production and control.*
Pg. 2	Paragraph 2 – Can the sections of the CWA and the Porter Cologne WQCA be referenced here, or will this background be contained in another document?
Pg 2	Paragraph 3 – A graphic timeline to show where in the process the external scientific review would occur would be helpful; how does this align with the completion of the CEQA evaluation/cost considerations?
Pg-2	Paragraph 5 – "Mercury levels vary by fish size, species"… and waterbody. The amount of mercury that a person takes ***in from consuming locally caught fish from an impaired water body*** depends on the amount, type, ***and size*** of fish consumed. Similarly, key variables in determining a safe level of mercury in fish are the amounts of fish eaten (consumption rate) and the type ***and size*** of fish. Also, these fish characteristics are related to bioabsorption rates in fish tissue—can we include information on the connections to bioaccumulation in the food web.
Pg. 3	Figure 1. As per the label below the figure "Average mercury concentrations in fish caught between Nimbus Dam and Discovery Park" ,are there sampling locations all along this area or only at the two distinct locations noted in the highlighted text below: i.e., Lake Natoma and near Discovery Park. What is the fish sample size and location of the fish sampled? What is the source of this information?
Pg. 3 onto 4	Provide an example of a trophic level 2 fish.
Pg. 3 onto 4	Scallops and tuna are grouped as "fish". Scallops are a shellfish.
Pg. 3 onto 4	"…Whether or not people also eat some commercial fish…" - What is the significance of this mixture? Are the levels of mercury in commercial fish and shellfish known? What do you mean by "commercial fish"—are both wild caught and hatchery fish within this category?
Pg. 4	Table 1. Target Options for Protection of Human Health. In the legend beneath—"…from Lower American River fish is the USEPA reference dose minus the methylmercury from commercial fish…" - What are these commercial methylmercury levels—is there a reference for where this can be found? How will knowing this help establish water quality objectives for the watershed?

Pg. 5	Paragraph 3. "Scenario B.2 may be an appropriate fish tissue target because it would produce significant improvement in the fish eaten by people (45% reduction of existing levels)." Is this level of protective reasonable and/or achievable—what is this based on? The assertion is made that the target appears technically achievable, relative to mercury concentrations seen in relatively uncontaminated areas. However, were the levels from the uncontaminated areas similar to the LAR project area – fresh, clear, cold water system with similar water chemistry, environmental conditions, food source, and fish species?
Pg-5	First bullet under SOURCE ANALYSIS – remove ***"Delta"*** food web… What studies are being referenced here—which ones and by whom?
Pg. 6	2nd Bullet. USEPA's CTR criterion (what is the reference for this?)
Pg-6	3rd bullet – a 44% reduction for the Sacramento River inflows may be easier to obtain from other tributaries that contribute a greater load to the Sac River such as the Yuba River or the Feather River. How would the TMDLs for these river systems be coordinated into the TMDL for the LAR and Lake Natoma? What process(es) determine whether or not a portion of the load reduction is assignable to the LAR and Lake Natoma?
Pg-6	4th bullet – density of mines is alluded to as a source for mercury – therefore the State Lands Commission and other entities responsible for abandoned mines should be listed as responsible parties to the impairment of the water bodies. "The April 2010 BPA indicated that initial reduction efforts should focus on watersheds that contribute the most mercury-contaminated sediment to the Delta and Yolo Bypass, such as the Cache Creek, American River, Putah Creek, Cosumnes River, and Feather River watersheds…"
Pg-6	Folsom Lake does not contribute to inorganic mercury and should not be listed as a source. The mercury is coming from the watershed and the atmosphere and not the reservoir. "Unidentified sources could include elemental mercury in the lakebed that is re-suspended during high flow and flood events. Elevated loads of methylmercury are from Folsom Dam, upstream wetlands, ***upstream tributaries,*** urban runoff, and methylmercury flux from sediment in open-water areas."
Pg-7&8	Table 2, 3, 4, 5, 6 - Where did the data come from and what was the period of record? Reclamation has total mercury data spanning many years that shows different values for Folsom. Reclamation also has data from other locations on the American River such as Rainbow Bridge and Negro Bar. Board staff conveyed that the 35% load contribution from Folsom Dam was derived

	from limited data collected downstream of Folsom Dam in a single year. Reclamation's historical water quality data is available to the Board to better understand the mercury flux in the reservoir.
Pg-8	Table 5 – Evasion footnote should be footnote "***e***" Folsom should not be listed as a source of total mercury for Lake Natoma unless there is scientific data to support such a determination. Dr. Slotton's report shows evidence that foothill reservoirs act as sinks for total and methyl mercury. There are other sources of runoffs between Folsom Dam and Lake Natoma – City of Folsom overland spills, stormwater runoff from developments, Folsom Prison, etc
Pg-9	Table 6 – Folsom should not be listed as a source for methylmercury unless there is scientific data to support such a determination. Dr. Slotton's report shows evidence that foothill reservoirs act as sinks for total and methyl mercury. Footnote e and f – How transferable are the Delta wetland production rates to this ecosystem? Bacteria, temp, environmental conditions, water chemistry are very different from the LAR. III. Potential Source Control Options – Preliminary Review – "Delta Waters" should be "LAR"…
Pg. 10	"Potential source control options could focus on reducing: (bullet 3)… Inorganic mercury loading from ***upstream*** tributaries to the lake and river; and..."
Pg. 10	Add water hardness, dissolved oxygen, and possibly type of organic content to the list of sediment factors and landscape events important in net methylmercury production and loss
Pg-12	Table 7 - Non-point source, open water habitat – Reservoir operations are not easily changed and are dictated by other regulatory agencies such as the Army Corp for flood control, DFG or NMFS for flows and temp requirements. Folsom Reservoir is managed in part to preserve cold water resources for listed salmonids (NMFS BO, June 4, 2009). Changes in dam releases (i.e., flows and circulation patterns) can affect the available cold water pool.
Pg. 13	Table 7 - Urban Runoff (point source): "Modify storm water collection and retention systems to reduce methylmercury production, e.g., installation of aerators or circulation devices in basins may promote degradation of methylmercury in the water column, and identification and removal of sediment from basins would reduce the supply of inorganic mercury available for methylation." *This is a good suggestion; how do we require that the public agencies install these and who is responsible to maintain in perpetuity?*
Pg-13	Table 7 - Wetlands Habitat – When suggesting operational changes to wetlands, how

	will the suggested activities impact the wildlife area, habitat, food source, variety of wildlife, quantity of wildlife?
Pg-14	3rd bullet – Camanche Res. and Almaden Lake are not similar to Folsom in that they are not managed to preserve a cold water pool.
Pg. 14	4th Bullet – "Evaluation of the removal, burial, stabilization, and/or other remediation of contaminated sediment in dredge tailings and other mine waste within the lake and river channel." *Evaluation of upstream abandoned mines as well?*
Pg 14	5th Bullet – Fish Management options. *Are hatchery raised fish bioaccumulating mercury at a different rate? Conduct studies on their physiological response to mercury as opposed to endemic species.*
Pg-15	Lake Natoma and Folsom Lake – Stakeholders that drain into the American River watershed will work with reservoir operators to conceivably conduct studies with the following goals: It is also important to understand the methylization pathway in a cold water system to possibly control other factors that contribute to methyl mercury production or encourage routes that lead to de-methylation.
Pg. 15	Nimbus Fish Hatchery and American River Fish Hatchery. See comment above regarding studies of hatchery-raised fish; what is causing the reduced uptake of mercury in the tissues and is this related to their status as a hatchery fish
Pg-17	Exposure Reduction – California Department of Health Services is now Department of Public Health.
Pg. 17	Central Valley Water Board. "Schedule a control program review concurrent with Delta Mercury Control Program review (about 2019)." *Coordination cannot wait until 2019. In order to maximize resources there should be greater* coordination with existing and/or new watershed groups to develop load reduction programs for watersheds tributary to the reservoir. *How will these TMDL be coordinated/integrated? Also, what about the rivers that are tributary to the LAR—see page 15, bullet 5.*
Pg-19	Lake Natoma nonpoint sources: Folsom Lake outflow should not be listed a "source" for methylmercury unless proven by scientific data. Dr. Slotton's report shows evidence that foothill reservoirs do not show a net export of total or methyl mercury but act as sinks. Lower American River nonpoint sources: Lake Natoma is a pass through regulating reservoir and does not contribute to a net increase in methylmercury. The data the Board provided in this straw proposal and previous workshop handouts show that the values in fish tissue were similar from Lake Natoma and the LAR. Include inflows to Lake Natoma as a nonpoint source.

Pg. 20	Aerojet Groundwater Extraction and Treatment Systems (point source). Include data collected by Aerojet in the source load tables (Tables 5 and 6)

Stakeholder Questions

Q-1	*Are there other fish consumption scenarios that should be evaluated? Is there other fish consumption information that staff can incorporate?* If commercial fish/shellfish consumption is to be factored in when computing the acceptable daily intake levels, would it matter if the commercial fish/shellfish were wild or farm-raised? What are the bioaccumulation rates for shellfish vs. fish—these differences should be accounted for when establishing targets. Site specific consumption rates is an important parameter to collect since the demographic are different than the Delta.
Q-2	*How would you evaluate target options? What targets would you recommend? If staff does not already have information supporting your recommendation, what information would you use?* Since there are information gaps in identifying sources and means of methylmercury production and control at the source and downstream these could be initial targets with some mechanism for revision once new information comes available. In evaluating various target options, the Board needs to remember that there are many beneficial uses in this water body – Rec, M&I, Cold and Warm water fisheries, habitat, power generation, etc., and some type of methodology is needed to prioritize and balance the competing needs and then determine the appropriate trade-offs when beneficial uses conflict.
Q-3	*There is a list of citations for the data used in the preliminary source analysis in included at the end of this straw proposal. Do you know of other data that could be useful for the source analysis? Do you know of any efforts underway of planned for future to collect additional water, sediment, or fish data in the American River watershed?* Reclamation has various monitoring programs in Folsom Lake, Lake Natoma, and the lower American River. In addition to water quality data, Reclamation has collected some sediment data on a smaller scale for specific projects. Reclamation also has GIS data for some of the surrounding watershed that would be helpful to identify land ownership or land uses. The Board should also approach PWCA, EID, and the American River Water Forum for additional data. Also, there are some potential data (currently unpublished) from the USGS—Lake Natoma and tributaries fish tissue studies and water quality data (methylmercury data). The POC's name is Charles Alpers. According to Charles, the

	Alder Creek methylmercury report is due for release in a few months and would provide this valuable information. Also, Sacramento County Department of Water Resources, Stormwater Quality Section's Ken Ballard indicated that the Drainage manager, George Booth, is working with the developer of the Easton Project (Gencorp property) to require some water quality sampling (including methylmercury samples) before development could begin. This development project's receiving waters are Alder and Buffalo Creeks. The Central Valley Regional Water Quality Control Board contact, Alex MacDonald recently indicated that Aerojet has historically collected water quality data for Buffalo and Alder Creeks. This data is available upon request in hard copy form only. A CALSIM model was developed by CH2MHill for the upper watershed that can be used to determine base flows.
Q-4	*Can you think of other potential control options besides those listed in Table 7?* For non-point sources, a house hold hazardous waste collection program targeted at mercury specific waste could reduce available mercury.
Q-5	*Can you think of other potential studies or implementation activities that would support an adaptive management approach for reducing LAR fish mercury concentrations and exposure?* Stopping at Folsom will lead to a fragmented and ineffective program. The entire watershed needs to be included of the TMDL. Understanding the methylation / demethylation process better in a cold water system will be useful in determining controllable factors and may lead to alternative solutions. Look at the role of bacteria in the methylation process; determine if there could be a control on this process that would be feasible; environmentally and economically. Consider a plan for how changes to the initial load allocations could be streamlined once final studies and management plans are in place.
Q-6	*Can you provide additional examples of potential environmental impacts that could result from implementation of the control options listed in Table 7 and possible mitigation measures to avoid or reduce impacts? [besides those listed in the above-referenced Delta methylmercury TMDL/BPA report]* Modification of reservoir operations could impact human health and safety, fishery needs, power generation, and ability for Reclamation to meet downstream requirements (as per recent BOs from NMFS and FWS). Modification of wetlands operations could impact wetland diversity and production.

Q-7	*Can you provide information about the potential costs of implementing the potential source control options listed earlier in Table 7 and possible ways to reduce those costs? [in addition to those cost estimate methods and cost reduction methods listed in the above- referenced Delta methylmercury TMDL/BPA report]* Need to look at the upstream watershed land uses and controlling sediment runoff to control mercury sources. Stopping at Folsom will lead to a program that is fragmented and ineffective.
Q-8	*Can you suggest possible allocation strategies given the distribution of inorganic and methylmercury source loads and concentrations described earlier in Tables 2 and 3? Can you suggest other methods to incorporate a margin of safety?* Reclamation should receive a load allocation credit similar to the credit given to the Westside Exchange Contractors in the Vernalis Salinity and Boron TMDL since the water that Reclamation receives into Folsom is already tainted with mercury.