June 12, 2008

Ms. Tam Doduc
Chair, State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Subject: Comment Letter – Walker Creek Mercury TMDL

Dear Chairwoman Doduc:

The Marin Municipal Water District (MMWD) appreciates the opportunity to provide comments to the proposal for a Basin Plan Amendment and Total Maximum Daily Load (TMDL) for Mercury in Walker Creek and Soulajule Reservoir. We have been working with the Regional Water Quality Control Board for a number of years to analyze the water quality and mercury bioaccumulation issues in this watershed, and have provided them with a number of suggestions on ways to proceed. We are pleased to work with you and your staff on this issue as well.

Discharge of Pollutants
The Walker Creek TMDL is focused on reducing mercury levels in fish in Walker Creek and Soulajule Reservoir. The staff report that supports the TMDL states that the reason that mercury levels pose a threat to water quality and an impairment of beneficial uses is due to historic mining in the watershed. (p. 11). The report also states that abandoned mines are the source of mercury contamination in fish in Soulajule reservoir (p. 18), and that they need to be regulated through an implementation plan that will control methylmercury production, to attain both in-reservoir and downstream TMDL targets.

MMWD supports the goal of reducing mercury levels in fish in Walker and Soulajule Reservoir. However, we disagree with the assertion that mining sites are the source of mercury contamination in fish in Soulajule reservoir. As noted in the Surface Water Assessment and Monitoring Program report from 2005, "Chemical Concentrations in Fish Tissues from Selected Reservoirs and Coastal Areas in the San Francisco Bay Region," numerous reservoirs in the San Francisco Bay Area contain fish with elevated mercury levels in their tissue, which exceed the Office of Environmental Health Hazard Assessment screening value of 0.3 mg/kg (ppm), as well as the fish tissue objectives proposed in this TMDL and Basin Plan Amendment. Of these reservoirs, Stevens Creek, Anderson and Del Valle all contain largemouth bass with average mercury concentrations that are the same as or higher than Soulajule Reservoir, and Del Valle is not in a watershed with historic mining operations. Fish in the other reservoirs monitored contain mercury levels that are not significantly lower than those in Soulajule Reservoir. The mining operations in the Soulajule Reservoir watershed consisted of extracting soils from the canyon and transporting them to the Gambonini mine, where they were processed. No tailings piles exist in the Soulajule Reservoir watershed and the mineshafts were sealed.

From all of this information, MMWD concludes that mercury contamination in fish in Soulajule Reservoir, as well as in the other reservoirs monitored (Anderson, Bon Tempe, Chabot, Lafayette,

Nicasio, San Pablo, Shadow Cliffs, and Stevens Creek) is generated primarily from the native concentrations of mercury in the cinnabar deposits that are common in each of these watersheds. The physical and biological processes that produce the bioaccumulation of mercury occur naturally and are similar to the processes that produce dissolved levels of other inorganic constituents and bioaccumulated constituents in other waterbodies throughout California.

These processes do not constitute a "discharge" of pollutants, and the State and Regional Water Boards should carefully consider any effort to regulate them pursuant to provisions of the water code that relate to this concept. It is for this reason that MMWD has objected to the proposed imposition of a requirement that it be responsible for implementing a plan to control the discharge of pollutants into Soulajule Reservoir. MMWD is more than willing to work with the State and Regional Water Boards in a collaborative process to determine cost-effective mechanisms to reduce the level of mercury in fish tissue in Soulajule Reservoir and its other reservoirs. However, as the next section demonstrates, the solution proposed in the TMDL and accompanying staff report (aeration of the reservoir) will not result in the attainment of the TMDL targets.

Proposed TMDL Levels are Not Attainable

As MMWD has noted previously in comments to the Regional Board, the Surface Water Assessment and Monitoring Program (SWAMP) data indicate that mercury is endemic in fish in reservoirs and other water bodies (including the Pacific Ocean) throughout the San Francisco Bay region and elsewhere in the California Coast Range. Furthermore, the control measures proposed in the TMDL are already implemented in two of MMWD's other reservoirs, and mercury levels exceed the target levels in those reservoirs. Accordingly, MMWD believes the proposed TMDL criteria are unattainable, even using best management practices, due to the naturally-occurring geology of the region. This conclusion rests upon the following data:

Reservoir	Bon Tempe	Nicasio	Soulajule
Watershed Setting	Pristine: 2/3 forest and 1/3 grasslands	Grassy hills surrounded by agricultural and rural residential.	Grassy hills surrounded by agricultural and rural residential.
Historic Mercury Mining	No	No	Yes
Mechanical Lake Aeration	Yes	Yes	No
Total Organic Carbon	2.3 mg/L average 2.0 to 2.7 range	4.2 mg/L average 3.5 to 5.2 range	4.9 mg/L average 4.0 to 6.5 range
Methyl Mercury in Water	0.09 ng/L	0.14 ng/L	0.15 ng/L
Mercury in Largemouth Bass	0.72 mg/kg average 0.536 to 0.899 range	0.61 mg/kg average 0.312 to 1.290 range	0.93 mg/kg average 0.540 to 1.870 range

Within the proposed Basin Plan Amendment, Regional Board staff has identified lake aeration as the most practical means to reduce methylation of inorganic mercury in sediment to the more toxic, methylmercury which can amplify as it travels up the food chain. Both Bon Tempe and Nicasio Reservoirs are mechanically aerated such that there is always dissolved oxygen in the water column throughout the year. Land adjacent to either Bon Tempe or Nicasio Reservoirs has never had mercury mining. However, methylmercury levels in all three reservoirs are comparable.

Reservoir Aeration Data from Santa Clara Valley Water District (SCVWD)

Regional Board staff have cited a reservoir aeration project at the SCVWD as having achieved "a 90% reduction in methylmercury concentrations." Upon further investigation, this statement is not applicable to the Soulajule Reservoir or the Walker Creek watershed.

The SCVWD study took place in Lake Almaden at the confluence of drainage from 2 mercury mines. The lake exhibits some unusual hydraulics that manifest in a couple of water columns that do not appear to be hydraulically connected (i.e separated by stratification) to the rest of

the lake. This results in a build up of methylmercury in the aqueous phase in these pockets with concentrations of around 120 to 140 ng/L. SCVWD installed a Solar Bee in one of these pockets of water and monitored the results. Although the methylmercury in the aqueous phase was reduced by 90%, when a similar Solar Bee was added to a reservoir that had a much lower concentration of 8 ng/L (over 50 times higher than Soulajule) the reduction of methylmercury was only 25%.

Interestingly, the Solar Bee mixer in Lake Almaden did not appear to increase the dissolved oxygen in the anaerobic zone but it did cause a change in the oxidation-reduction potential (ORP) and this appears to have been enough to change the conditions in the water column such that methylmercury levels were reduced. MMWD contends that the effectiveness of aeration observed in Lake Almaden cannot be replicated in Soulajule because the methylmercury levels are already so much lower that the effectiveness of aeration is severely limited. Data from MMWD's aerated reservoirs support this conclusion. As shown in the table above, MMWD believes that the best that can be achieved for Soulajule will be similar to the mercury data for water and fish tissue that is found in similar aerated reservoirs in the area, Bon Tempe and Nicasio. MMWD believes that will also be true for other reservoirs in the California Coast Range.

Cost of Aerators

The staff report notes that the cost of installing an aeration system for Soulajule Reservoir would be on the order of half of a million dollars. Additionally, electricity to power these aerators would be approximately 150,000 kWh per year, and cost $15-20,000 per year. In addition to these costs, which MMWD believes are not justified, given the marginal difference aeration would make in reducing mercury levels in Soulajule Reservoir water and fish, the additional electrical power demand would increase emissions of greenhouse gases. This would be contrary to California's greenhouse gas emissions reductions goals, laid out in AB 32, as well as to MMWD's own greenhouse gas emission reduction program.

Solar-powered aerators (Solar Bees) are a possible alternative, but their initial cost is even higher - $600-700,000, depending on the number necessary to cover the reservoir's geometry. Added to this initial capital cost is the cost of maintaining and repairing the Solar Bees, which is difficult to predict. In any case, this alternative also represents an expensive option with little benefit to the ecosystem. Neither of these aeration alternatives satisfies the cost-effectiveness criterion articulated in Water Code Section 13000, et seq.

Mercury Detection Limits for Laboratories

MMWD disagrees with Regional Board staff that testing laboratories can achieve accurate and reliable test results for methylmercury down to 0.04 ng/L. We also disagree that laboratories can achieve accurate and reliable test results for dissolved mercury below 0.5 ng/L from which an accurate mercury in suspended sediment value can be calculated.

MMWD has contacted the laboratories listed by Regional Board staff. The proposed limit for methylmercury of 0.04 is below the reporting limit of the laboratories. The reporting limit for the EPA-approved method is 0.06 ng/l. Some laboratories have indicated that they may be able to achieve a reliable reporting limit of 0.05 ng/l. However, both limits are above the proposed water quality objective. If laboratories are requested to report below their reporting limit, the data would be qualified with the following statement/s:

"J- reflects estimated analytical result value detected below the Reporting Limit (RL) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag."

or:

"Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag)."

The proposed total mercury in suspended sediment has a similar quantification problem as the laboratory reporting limits are 0.5 ng/L, and the calculation includes both total and dissolved mercury values. Any total or dissolved mercury value below 0.5 ng/L would be reported by the laboratories using the same language noted above, again estimated values.

To illustrate by example:

- A total mercury water column value is 0.6 ng/L (above the proposed TMDL expressed in mg/kg when factoring in the 1,000,000 bioaccumulation factor), and above the lab reporting limit of 0.5 ng/L.

- The dissolved water column mercury value is <0.5 ng/L, but has an estimated value of say 0.3 ng/L.

In this example the dissolved mercury value could have a precision of plus or minus 200-300%, and the computed value of total mercury in suspended sediment (total minus dissolved mercury multiplied by one million), is only an estimate to apply against the numeric TMDL.

MMWD believes that it is inappropriate to set numeric standards against which only estimated values would necessarily be applied. This belief is supported by the USEPA's "Technical Support Document for Water Quality Based Toxics Control" which states "....EPA recommends that the compliance level be defined in the permit as the minimum level (ML)." The ML for low level mercury is 0.5 ng/L. In this same document EPA states when choosing a level other than the ML "Where the permitting authority so chooses, the authority must be assured that the level is quantifiable, defensible, and as close as possible to the permit level." MMWD does not believe an estimated value is a quantified value as evidenced by the "J" flag qualifiers noted above.

Thank you for the opportunity to provide this input to the Board's deliberations on the proposed Walker Creek mercury TMDL. We look forward to discussing this topic with the Board when it is agendized for deliberations.

Sincerely,

Paul Helliker
General Manager