



Mercury Pollution in Northern California

## Delta Tributaries Mercury Council



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~ Meeting Minutes ~

Wednesday, October 14, 2009

12:30 p.m. – 4:30 p.m.

707 4<sup>th</sup> Street, Suite 200; Davis, CA 95616

**Facilitator:** Stephen McCord, LWA

**Meeting Minutes by:** Stephen McCord, LWA

### Attendees

#### In Person

Leah Wills, Plumas Co.

Dave Lawler, BLM – CASO

Harry McQuillen, BLM – CASO

Leslie Laudon, SWRCB

Libby Earthman, Putah Creek Council

Bob Schneider, Tuleyome

Russ Anderson, Clean Water Vision

Steve Dangler, Clean Water Vision & NatureClean

Larry Wolfe and Cindy Keller, Clean Water Vision & NW Remediation

Tim Stevens, CA DFG

Bill Whiteside, Blue Sky Water Technologies

Carrie Monohan, The Sierra Fund

Izzy Martin, The Sierra Fund

Chad Dibble, CDFG

Sara Martin, SRWP

Mark Stevenson, CDFG

Hong Lin, City of Sacramento

Fraser Shilling, UC Davis

Noel Lerner, DWR Dept Flood Management

Frank Ramirez, The Americas Group

#### Via Teleconference

Patrick Morris, CVRWQCB

Michelle Wood, CVRWQCB

Sherri Norris, CA Indian Environmental Alliance

Don Yee, SFEI

## I. Introductions and Agenda Review

## II. Project Updates

- USGS studies in Bear/Yuba (Carrie Monohan)—USGS has a \$2 million budget to monitor biotic exposure to and uptake of mercury in Lake Combie associated with a sediment dredging and mercury removal project
- CDOC Abandoned Mine Lands Inventory (Izzy Martin)—Resources Secretary Mike Chrisman recently ordered the release of a newly compiled inventory of abandoned mine properties *owned by the State of California*. In releasing the report Secretary Chrisman directed the Office of Mine Reclamation of the California Department of Conservation to take the lead in prioritizing and coordinating abandoned mine remediation efforts on the inventoried properties. See <http://www.sierrafund.org/news/385-CDOCInventory>.
- BLM mine site clean ups (Dave Lawler, BLM)—The Ukiah Field Office is planning a cleanup project for the Rathburn-Petray mercury mine site in the Bear-Cache Creek

watershed for FY2010. Pre-construction monitoring studies will be undertaken prior to the onset of cleanup. The Mother Lode Field Office is planning cleanups at the Davis mine/mill (south Fork Yuba River watershed) and Poison Lake (Mokelumne River watershed) during FY2010.

- AML Forum—The September meeting was cancelled.
- Delta Mercury TMDL (Patrick Morris)—A stakeholder group, consisting largely of those dischargers to be regulated by the TMDL, have agreed to a charter formalizing their participation. Regional Board hearings will provide another opportunity for broad public input into the policy debate. The Basin Plan amendment for the TMDL is tentatively scheduled to be heard by the Regional Board in early 2010. The DTMC may play a role in future TMDL development and implementation as an open forum for exchanging technical information and discussing policy.
- Cache Creek Mercury TMDL implementation (Patrick Morris)—Staff have inventoried mercury in Cache Creek Canyon and in the Bear Creek tributary.
- 303(d) list of impaired waters (Michelle Wood)—The new 2010 list for the Central Valley adds 52 new listings for mercury, adding to the 48 on the current 2006 list. The State Board's Listing Policy uses a probabilistic (binomial) method to determine impairment while the Cache watershed TMDL and water quality objectives adopted by the Board use average concentrations to determine extent of impairment which is why Indian Valley Reservoir on the North Fork of Cache Creek is added
- Regional Board WWTP MeHg analysis (Michelle Wood)—Staff are still addressing comments and reviewing the document internally.
- News article—DTMC participant Fraser Shilling (UCD) and Jerry Bruns (Regional Board) were quoted in a widely published Associated Press article on mercury contamination around the state. See <http://images.usnews.com/science/articles/2009/09/18/government-stands-by-as-mercury-taints-water.html>.
- Technical article—The USGS recently published a technical report documenting mercury deposition from human sources of air pollution, methylation in the ocean, bioaccumulation in fish, and subsequent exposure to humans eating ocean fish. See [http://toxics.usgs.gov/highlights/pacific\\_mercury.html](http://toxics.usgs.gov/highlights/pacific_mercury.html).
- Biosentinel monitoring—No update
- SRWP Update (Sara Martin)—Three grant-funded projects by the SRWP that were frozen have now been reactivated. In particular, efforts to develop the SWIM module and a watershed atlas are back underway.

### **Funding Sources (Leslie Laudon)**

Ms. Laudon covered the available funding sources the State Water Resources Control Board. Current funding sources are:

- Federal Nonpoint Source Implementation [319(h)] Grant Program - both planning and implementation grants available this year. Expect to release RFP late October with concept proposals due early December. About \$4.5 million will be available for projects to restore impaired water bodies identified as preferences by the Regional Boards. We might be able to offer more funds depending on the state's bond sales. The Hg-related

TMDL preferences are Cache Creek, Clear Lake and the Delta. It is important to work with the Regional Board on developing projects to be competitive.

- Clean Water State Revolving Fund (CWSRF) - continuous application low-interest loan program to fund wastewater, stormwater, NPS and estuary projects. 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.
- 604(b)/205(j) - small amount of funding (from our CWSRF grant from USEPA) available annually for local agency planning. Grant program is a pass through administered by the TMDL/Basin Planning Program so contact the Regional Board TMDL staff to discuss potential projects.
- Prop 84 Stormwater Grant Program - There will be \$82 million statewide, but the program was suspended until the state sells bonds to fund the program. Sign up for email notifications for announcements when the program resumes.
- Cleanup and Abatement Account (CAA) - funding is from judgments, fines and administrative civil liabilities. Public agencies authorized to cleanup or abate waste can request funds for projects. 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.

For more information on any of these programs contact Leslie Laudon, Division of Financial Assistance, State Water Resources Control Board, (916) 341-5499, [LLaudon@waterboards.ca.gov](mailto:LLaudon@waterboards.ca.gov), [http://www.waterboards.ca.gov/water\\_issues/programs/grants\\_loans/](http://www.waterboards.ca.gov/water_issues/programs/grants_loans/). Also, the State Board has several grant and loan email lists to receive notices of RFPs or workshops. You can sign up at [http://www.waterboards.ca.gov/resources/email\\_subscriptions/swrcb\\_subscribe.shtml](http://www.waterboards.ca.gov/resources/email_subscriptions/swrcb_subscribe.shtml).

### III. Presentations

Stephen M. initiated the discussion of mercury reduction projects by noting consistency with language in the draft Basin Plan amendment for the Delta Methylmercury TMDL:

- Watershed stakeholders are encouraged to identify total mercury and methylmercury reduction projects and propose and conduct projects to reduce upstream non-point sources of methylmercury and total mercury. The Regional Water Board recommends that state and federal grant programs give priority to projects that reduce upstream non-point sources of methylmercury and total mercury.
- Dischargers may direct imposed administrative civil liabilities towards total mercury and methylmercury reduction projects in their watersheds, consistent with supplemental environmental project policies.

The intent is that by discussing projects—both specific and conceptual—stakeholders will learn about projects' status, proponents, obstacles and potential partners.

#### **1- Mining's Toxic Legacy Initiative, Izzy Martin (The Sierra Fund)**

Izzy Martin presented information about a project by The Sierra Fund called "Mining's Toxic Legacy", an initiative to address mining toxins in the Sierra Nevada. The initiative includes a large "Gold Ribbon Panel" of advisors and an equally large group of science and policy advisors.

Mines contaminating the landscape and waterways are owned by a variety of potentially responsible parties, including private landowners, city and county governments, and state and federal land managers. The suite of solutions to improving the environment includes: funding new research, improving and funding government programs, inventorying public lands, and undertaking pilot projects. Pilot projects include providing health education, passing local ordinances and land use planning initiatives, and mine site cleanup project that address legal and liability issues.

The Sierra Fund is participating in the Supplemental EIR for the CA Dept of Fish & Game's statewide permit for hobby-scale suction dredging, has surveyed anglers in Sierran reservoirs to estimate consumption rates and mercury exposure, and has conducted a dusty activities survey.

Advocacy efforts to bring state and federal funding to mercury projects have identified the following potential sources:

- For mine site remediation: Proposition 13, Proposition 84, and a new Water Bond
- For health and community impact studies: EPA Community Assessment Funds and private endowments

Constraints to overcome include limiting the liability risk for potential implementers and the disconnect between water quality regulations (TMDLs) in the Delta and lower watershed from the source of mercury above major dams.

The link to the article she mentioned "Winged Mercury and the Golden Calf" is available at:

<http://www.orionmagazine.org/index.php/articles/article/176/>

For more information: Izzy.Martin@sierrafund.org, www.sierrafund.org, 530-265-8454 x11

## **2- Upper Feather River IRWM Program, Leah Wills (Plumas Co.)**

Leah Wills spoke on behalf of Brian Morris of Plumas County, who was unable to attend. The focus area was the upper Feather River Watershed. This area was highlighted in the DTMC's Strategic Plan for having a relatively high mercury load per unit area. The area is also delineated under the Dept of Water Resources' Integrated Regional Water Management Program (IRWMP). The IRWMP for Plumas County includes local, state and federal governments agencies, special districts, and entities representing Native Americans.

The IRWMP strategy includes water quantity and water quality elements. The typical project that addresses both strategic elements is stream restoration. Projects in the upper Feather River watershed included Wolf Creek, Last Chance Creek, Cottonwood Creek and others. Benefits include flood attenuation, improved riparian habitat, and streambank stabilization (reduced erosion).

For more information visit [www.FeatherRiverWater.com](http://www.FeatherRiverWater.com).

## **3- Abandoned Mines and Toxic Mercury Cleanup, Bob Schneider (Tuleyome)**

Tuleyome is a non-profit organization working to protect the wild and agricultural heritage in the Northern Inner Coast Range and Western Sacramento Valley. Bob shared efforts under Tuleyome's Abandoned Mine and Toxic Mercury Clean Up Program.

As a result of geologic characteristics, the Cache Creek Watershed was noted to represent on the order of one-quarter of the mercury load to the Delta (or one-half if the Cache Creek Settling Basin were removed). All of the waterways in this area are impaired by mercury while dozens of

large-scale mercury mines in the Putah Creek and Cache Creek watersheds continue to lie exposed to erosion. The North Fork of Cache Creek was considered impaired in the new 2010 listing.

The only mercury TMDLs approved to date in the Central Valley are in this watershed. Another mercury TMDL is scheduled for Putah Creek adjacent to the south. Some progress has been made to characterize the mine sites and clean up the landscape (i.e., Abbott-Turkey Run Mine), however much more work is needed. Tuleyome is advocating for more regulatory effort, more funding for mine site cleanups, and greater stakeholder participation in land management decisions.

For more information visit [www.tuleyome.org](http://www.tuleyome.org).

#### **4- Development of BMPs to reduce MMHg loadings in the Yolo Bypass, Mark Stephenson (Moss Landing Marine Labs, CA Dept Fish & Game)**

The Yolo Bypass is a major methylating environment and has the highest methylmercury (MeHg) concentrations in the Delta (~100 times greater than in the Sacramento River). The CA Dept of Fish & Game, in collaboration with Moss Landing Marine Labs researched the benefits of reduced methylmercury production associated with various best management practices (BMPs) for managed wetlands in the Bypass area south of I-80. BMPs considered included:

- Vegetation management—Selecting key plant species, effects of reduced biomass
- Water management—Effects of controlling flow-through, flood-up time, draw-down time, summer irrigation, topography, pond depth, and water recirculation
- Permanent pond effects—photodemethylation rates, sedimentation rates, and biological uptake/removal of mercury

The study had several objectives:

- Determine MeHg concentrations in water in several types of seasonal and permanent ponds in the Yolo Wildlife Area (YWA) and relate those concentrations to types of wetlands and how they were prepared before flood up in Fall
- Determine if methylmercury concentrations in tailwater from seasonal ponds could be reduced when discharged into permanent ponds and if grazing on the seasonal fields could reduce MeHg production
- Determine if MeHg production is related to vegetation on top of sediment, dissolved oxygen levels, or the quantity of plant biomass

Key conclusions were that:

- MeHg production was highest in seasonal ponds, particularly during the first month of flood-up and less after January
- Ground cover treatment (disking vs mowing) did not significantly affect MeHg production, but grazing (reducing overall plant biomass) did significantly lower MeHg production
- MeHg in tailwater from seasonal ponds can be reduced by 50%-90% in permanent ponds
- MeHg in overlying water was significantly increased under low dissolved oxygen conditions

Future studies to improve the understanding and quantification of wetland BMPs for controlling MeHg production include the type and biomass of plants, effects of grazing before flood-up, permanent ponds as treatment for seasonal ponds with high MeHg in tailwaters and discharge volume reduction. These results should be applicable elsewhere in the Delta.

### **5-Mercury Removal Technology, Bill Whiteside (Blue Sky Water Technologies, Inc.)**

Blue Sky Water Technologies President Bill Whiteside presented proprietary technology for removing heavy metals from water. The Ionic State Modification (ISM) technology breaks chemical and ionic bonds between contaminants and water molecules using magnetic, electrolytic and chemical techniques. Through the process, the metals' valence state is changed and they precipitate out of solution (in some cases, producing ~0.5 ft<sup>3</sup> of metal cake per 1000 gallons treated).

Results from a pilot test at Mammoth Mine (acid mine drainage) and bench tests at Leviathan Mine and Iron Mountain Mine were shown to remove several heavy metals to non-detectable levels (ppb). Removal rates were on the order of 99%. While mercury specifically has not been evaluated, it is expected that similar removal efficiencies would be possible. Costs based on a study at Mill Bull Tunnel for electrical supply, equipment, operators, and chemicals were reduced substantially over other conventional methods.

The 9-minute video that we didn't get a chance to show is available at: <http://www.blueskytechnologies.biz/mammothvideo.html>. HPT used to have the license for this technology; now Blue Sky does. The website also includes process data and descriptions of potential solutions to a myriad of water treatment problems.

For more information contact Bill Whiteside, Blue Sky Water Technologies, Inc., 916-988-1182, [bill@blueskytechnologies.biz](mailto:bill@blueskytechnologies.biz), [blueskytechnologies.biz](http://blueskytechnologies.biz)

### **6-Combie Reservoir Sediment and Mercury Removal Pilot Project, Carrie Monohan (The Sierra Fund)**

Dr. Monohan presented a pilot study to evaluate the effectiveness and operation parameters for recovering mercury in dredged reservoir sediments. Lake Combie's watershed includes several major abandoned gold mines where mercury was used. The project's components included a floating electric dredge, a submersible and above-ground pipeline, a mobile dewatering system, a mercury concentrator, floating turbidity curtains and trucks.

The mobile concentrator unit used to separate mercury from the dredged material was found to be 98% efficient. Testing is still underway to account for mercury in the dredged material, return water, lake water and biota. Other constituents are also being monitored. The USGS is providing additional technical support to study mercury in the water and food chain in the lake and downstream Bear River. Full-scale operation is scheduled for 2010-2013.

For more information contact Carrie Monohan, (530) 277-2040, [carrie.monohan@sierrafund.org](mailto:carrie.monohan@sierrafund.org)

## **IV. Upcoming Events**

- State and Regional Board workshop—A workshop will be held on October 21 in Redding concerning water quality and regulatory issues associated with inactive mines. The focus is on Iron Mountain and other non-mercury mines in the Redding area.

- AML Forum— The next Abandoned Mine Lands Forum and CAMLAG meetings will be held on Wednesday, November 18.
- Clear Water Vision (Russ Anderson) is planning a workshop on or around November 12 in Brooks with support from the Cache Creek tribal community. Workshop participants will be considering what has been done thus far to address water pollution and then identifying a resolution planning area for the Clear Lake/Bear Creek/ Cache Creek contamination sources for future studies. Clear Water Vision is working with local tribal communities in increasing awareness, education, and promoting effective resolutions for these issues. Stephen M will present on mercury issues and the DTMC's role.
- The Sierra Fund is sponsoring a full-day “This Way to Sustainability” Conference with a “Mining’s Toxic Legacy Symposium” on Friday November 6 at Chico State. Stephen M will present on mercury issues and the DTMC's role.
- The Sierra Fund is also leading an effort to organize a Mining’s Toxic Legacy Working Group. The strategy for forming the group will be discussed in late October and shared with the DTMC for discussion subsequently. Stephen M will participate in the strategy meeting on the DTMC's behalf.

## **V. Meeting Wrap-Up**

### **Action Items**

- Stephen McCord: Compile meeting notes and announce availability on DTMC web site.
- Bill Whiteside: Conduct pilot testing of water testing system on mercury-contaminated water and share results with DTMC.

### **Future Agenda Suggestions**

- Outlining an alternative stakeholder process and interaction with Integrated Regional Water Management Programs for the ~100 mercury TMDLs needed for the Central Valley.
- Hobby-scale suction dredging permit program SEIR project for CDFG by Michael Stevenson (Horizon Water and Environment)
- Summary of findings from the second of two years of SWAMP monitoring of fish in California lakes by Jay Davis (SFEI)
- Study of contaminant biouptake by caged fish in San Francisco Bay area by Josh Ackerman (USGS)
- Evaluation of lake monitoring data combining fish and water column mercury data by Mark Stevenson (MLML)

### **Next Meeting Place and Time**

- Late January or early February, 2010
- Larry Walker Associates offices in Davis, unless suitable space in Sacramento is identified