North San Francisco Bay Selenium Total Maximum Daily Load
Advisory Committee
MEETING SUMMARY
Meeting #2
April 1, 2008

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1. Welcome

Dave Ceppos, California State University Sacramento, Center for Collaborative Policy (CCP), opened the meeting for the North Bay Selenium (Se) Total Maximum Daily Load (TMDL), welcomed participants, reviewed the agenda and went over the handouts. Mr. Ceppos explained that for every item on the agenda there would be an opportunity for non-Advisory Committee (AC) members to comment. He explained that he would be taking comments from AC members first, and then non-AC members. Self-introductions of all attendees were then made.

2. Operating Rules

The Draft Operating Rules were adopted by the AC as Final. Diane Fleck of the US Environmental Protection Agency (EPA) Region IX noted that as a regulator and final decision-maker on the TMDL, they retain the responsibility to address items of concern at any time, even if it is a topic that has not previously been raised. They reiterated their commitment to participate fully in the AC process but that this caveat is important. Mr. Ceppos confirmed that this is appropriate and must be the case for any regulator.

(To view the Operating Rules, go to http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/tmdls/seleniumtmdl.shtml for a copy of the final adopted rules.)

3. Status Report of Work to Date & Summary of Se TMDL Process

Barbara Baginska, San Francisco Bay Regional Water Quality Control Board (Water Board), Project Manager and engineering geologist provided an overview of where the group is within the TMDL process. She showed a timeline slide, noting that the next planned meeting of the AC is in September 2008 and the final meeting, also a California Environmental Quality Act (CEQA) Public Scoping Meeting will be in December 2008. AC members are expected to attend the December meeting despite the difference in meeting format (due to CEQA requirements).

Ms. Baginska then discussed the technical activities to-date. AC members were previously provided the two technical reports for review (Technical Memorandum #2, Selenium Data Summary and Source Analysis (Source Characterization); and Technical Memorandum #3 (Toxicological Assessment Report) prior to the meeting. Both documents have already been reviewed by the EPA, US Geological Service (USGS) and the US Fish and Wildlife Service (USFWS). Ms. Baginska and the consultant team at Tetra Tech (Tt) (technical consultant to the project) received many helpful and appropriate comments from these reviewers. The Water Board took all

the comments very seriously, and they were pleased that after the reports were revised and sent back to the reviewers, the corresponding response was positive.

In parallel they have been working on the Conceptual Model report. This has taken longer than anticipated. The Source Characterization findings support the conceptual modeling process so all the comments on the former had to be considered when working on the latter. Part of this effort has been to conduct model evaluation. Water Board and Tt staff have been assessing various modeling tools and methods to determine what will work well and be scientifically based for the San Francisco Bay.

Ms. Baginska stated that the initial idea for the conceptual model and the types of models being considered would be addressed later in this meeting. She explained that from the outset of this TMDL effort, the Water Board knew they'd need review from experts in the field. Individuals were contacted from across the US. She explained that a list of potential reviewers would be reviewed later in the meeting and that AC members would be asked if there is anyone else who should be part of the review group. The technical review process will include evaluation of the conceptual model, the overall modeling approach and the final results of the model. The hope is to have two technical review meetings with AC members present at both.

Ms. Baginska described how these technical efforts will be translated into the TMDL. She explained that she is currently working on the staff report. She noted that she does have a write up of the numeric targets but this is still under development. At the September meeting she will present what she thinks these will be.

Comments from the AC:

Question: Regarding the conceptual model, what do the gray and green bars mean?

- That references the time when we want to have a revised draft ready.

Question: Are you expecting comments from us and if so, when?

- You received the report two weeks prior to the meeting and you will have two more weeks to provide written comments (Comments due on 4/14/08). If the comment is not specific and does not point out an error it will be taken into account for the TMDL staff report. Your comments will not be incorporated into the technical memorandum (unless you are noting a mistake in which case we will address the error). Comments should be provided in electronic format.

- Regarding the availability of AC comments about the Technical Memoranda, Ms. Baginska confirmed that she will maintain a record of all comments and AC members wanting to see input from others should contact her and she will provide the collective comments.

Comment. I'd like to select which comments I could see. Can we download them from the Internet? I would like to see comments from agencies that are of interest to my organization.

- In response Ms. Baginska revisited the project process diagram on the overhead projector. She explained that the approach for technical review has several steps. An initial step is that preliminary reviews of early draft documents are to be made by agencies the EPA, USGS, and the USFWS. The

purpose of this early review is to improve the quality and effectiveness of the technical reports. This is like an internal review of the documents. After this initial review, the AC then sees a document and has opportunity to make comments. Formal agency reviews and public reviews will also take place during the 45-day public comment period later in the TMDL development.

- Tom Mumley, Water Board Assistant Executive Officer noted that if someone has a question just give Ms. Baginska a call and she will tell you anything you want to know.
- Mr. Ceppos then summarized that there are two tiers of review: (1) Internal Review; (2) Collective AC reviews.

Comment: Remember that beyond the EPA approving the TMDL, there also will be a USFWS review (consultation) on the entire basin plan amendment.

Question: The actual modeling work will be completed in the June/ July timeframe. Will we get any information as to how you'll develop the numeric targets?

- At this time we are still unsure as to the specific method to develop the numeric targets.

That is important because you can't do the modeling until you have those numbers.

- It's important to develop targets but in this case the modeling might be helpful to see how these targets might be achieved. That said, the comment is accurate that we need the targets to support the model. The modeling isn't that time consuming. Its' setting up the model that's time consuming.

Comments from the Public:

Tom Grieb, Tetra Tech, noted that the toxicological assessment (TM3) has been released for comment by the AC. As noted earlier, this report has already been reviewed by staff from the EPA, USGS and the Fish & Wildlife Service.

Ms. Baginska reiterated the way the process has been set up. The reports are released to the AC prior to the meeting. After the comments are received the reports will be revised and then posted on the website (approximately within the next month). Mr. Mumley noted that the Water Board will be using the email list server strategically so anyone on that list will be notified when new information is posted on the web. Ms. Baginska did note that all the state agency websites are being updated and as of March 31, 2008 they are on a new platform and the Water Board is going though the site to figure out what is there. If anyone has any comments or observations to improve the website do not hesitate to comment.

4. Technical Memorandum 2 (Source Characterization)

Sujoy Roy, Tetra Tech, gave a PowerPoint presentation on Technical Memorandum #2

Beginning with a map (slide 2) showing the geographic scope of the TMDL and noted that they may look for data further out. The map showed the tributaries flowing to the North Bay and it was noted that the Guadalupe River is not part of this TMDL.

The PowerPoint can be viewed on the Water Board website at
http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/tmdls/seleniumtmdl.shtml
(Note: It will be helpful to print this presentation in color.)

In regards to an inquiry about stormwater:

- Mr. Roy explained that stormwater is not treated as a separate source. They are looking at urban area within tributaries and he said that he didn't know how many drains were going right into the North Bay. He said that the AC can discuss that but that his team hasn't seen any data on selenium in stormwater discharges.
- Eugenia McNaughton of EPA noted that assigning a number(load) to storm water dischargers is required for a TMDL.
- Mr. Mumley explained that to the extent possible the Water Board needs to answer some key questions: How much of that is background? How much is naturally occurring? What is included in the urban runoff? What are the distinct sources of urban runoff? Current estimates fall short as there is a limited amount of urban runoff data.

Question: The Guadalupe River flows in the South Bay and the South Bay connects to the North Bay. How will that be accounted for?

- Mr. Roy explained that they will explore this topic more and that it is a good point. The South Bay is connected to Central Bay hydrologically. There is a poorly defined geographic and physical boundary. There remains an incomplete understanding about flow exchange between the north, south and central parts of the Bay.

But there is an outflow through the Golden Gate also from the South Bay.

- Mr. Roy: That is a valid point and we should compare those numbers. What it amounts to is do you need to include Guadalupe River inputs as well?

It was noted that the Guadalupe River is described in the last table of the Source Characterization Report.

- Mr. Roy: To reiterate, we have looked at it, but the Guadalupe River load is some distance from the boundary being evaluated for these load estimates.

When going over the map showing the distribution of the point source discharges (page 5 of slide handout) Central Valley Water Board representatives noted that they have data that could be used, including State Surface Water Ambient Monitoring Program (SWAMP) data, and historic "flat file format" data that has recently been posted on the web.

Chris Eacock and Mr. Roy said they would follow up with each other about getting data from the State Water project as Mr. Eacock explained that the US Bureau of Reclamation has a lot of information to share.

Mr. Roy encouraged everyone to please feel free to contact him with more comments or data.

Questions regarding the Estimated Loads slide (page 10 of handout):

Comments from the AC:

For this portion of the analysis are the highly urbanized areas excluded from the analysis?

- Mr. Roy: No, they are not excluded, we looked at established sampling stations to see what was contributed. However, we didn't have data to separate background and urban sources.

Do we have an understanding of the sources? Is it wastewater treatment facilities?

- Mr. Roy: The concentrations in the tributaries are high in the low flow and high flow season. We know sediment concentrations are also very high compared to stations in the Bay. There might be significant inputs to the Bay, for example the Napa River. It is hard to get a straightforward answer because the data are limited.

Question: A little while ago there was talk of additional sampling data available. Would this be significant enough to make a change? I know you had explained that generally, more data is more of the same data. Do you think if you had that data would it change your key findings?

- Mr. Roy: I doubt it. The big flows are well characterized and based on the total number of data points, there would have to be significantly different and extensive other data points to change the findings. However, additional data is always good.
- Ms. Baginska: The resolution of the results could change but not the outcomes.

Question: Do you know what is coming in with the ocean tides?

- Mr. Roy: I think the Golden Gate estimate is based on the net exchange of inflow and outflow. I think it is fairly small.

I am wondering if there is the potential to be double counting selenium due to the tides; selenium that comes in an out could be getting recorded twice at sampling stations. This could happen well upstream including the Carquinez Strait.

- Mr. Roy: It is an interesting possibility and we can explore that potential with the model in the future.

Comments from the Public:

Question: Does the system include a portion of the sediments? What do you do? Look at the top 15 centimeters (cm) of sediment?

- Mr. Roy: Yes, the model itself is open ended. Erosion is adding to the Se in the water each year. If one wants a long-term evaluation of this, it can be done.

If there is Se in the top 15cm, is that part of conceptual model? What about sediment lost?

- *Mr. Roy:* Yes, the Se in the sediment is part of the conceptual model
  For 5cm to 15cm deep, the Se is fairly consistent. We have contracted selenium analyses in the sediment cores to see what contamination is further below. But the near-term answer is that the profile is pretty flat.

Comment: Regarding the uptake of selinite and selenate, I am astounded there are not separate numbers/ estimates for this.

- Mr. Roy: The report does address speciation. But you'd be surprised how little data is actually available on the speciation of Se from different sources. Many data sources don't have it and instead, address only total Se. We discuss this issue in the Summary of the Source Assessment report.

The data is not available, but speciation is a critical factor. Talking about total Se is like talking about various forms of carbon-based molecules. It can have dramatic difference in effects based on which molecule it is.

- Mr. Roy: We are doing a detailed chemical model and we are working with that model as we speak. Speciation is critical to everything.
- Dr. Grieb: Speciation is crucial to our analysis. What we've done here is look at the largest amount of data. You'll see in a moment we aren't neglecting the issue.

Comments from the AC:

Comment: More data is needed. If we didn't have the body of data discussed today we'd have a hole we'd have to rectify. It is good to have a group like the AC because other data sources have been brought up.

Question: This begs another question. Are all the possible parties that have data sets sitting around the table so they can submit their data sets? I would have thought that Tetra Tech would have identified all the data before putting this information in front of us. I am surprised that just in this meeting we are still identifying data sets from highly visible players.

- Mr. Roy: We can obviously get more data and it is important to be comprehensive in our data set. However and as I previously said, I doubt that more data will negate any of our findings.
- Mr. Grieb: Our evaluation has been extensive and thorough. We look forward to getting all this data.

Before the break Barbara Baginska noted that when the draft report is out the conceptual model might be truncated.

Meeting Break.

5. Central Valley Water Board Presentation

Jeanne Chilcott and Rudy Schnagl from the Central Valley Water Board gave a PowerPoint presentation and had a corresponding handout entitled "History of the Central Valley Selenium Control Program".

To view this document go to:
http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/tmdls/seleniumtmdl.shtml

The handout had sections including: Background; Problem; Partial Solution; Se Control Program Part I; Se Control Program part II; current process and then Findings and a discussion titles "Where Do We Go From Here?"

Rudy also showed some slides from Tara Smith, DWR, and encouraged all to view it/ get it from her (tsmith@calwater.ca.gov).

Comments from the AC:

Comment: Regarding TMDL requirements with reduction loading with the Grasslands Bypass Project Concepts and monthly loads based on water year type (2001) [bottom of page 2 of handout]

- Mr. Schnagl - We started out at 12,000 lbs. We established load limits but knew it would take some time to reach those. We developed a glide path requiring declining load discharges and when reached amount not to cause downstream problems, so in wet year it levels off. Now it will let 4,500 lbs of Se come out of the area. (He showed above normal, dry, below normal rainfall year.) We'll have until 2011 to meet 1,000 lbs load limit in a year. This is out of SJ drain at lower end of the project area.

Agenda Review / Adjustment

Ms. Baginska explained that for the rest of afternoon the agenda would be changed slightly. There would be a short piece on the Toxicity Report then the group will review and discuss the Technical Review process, and then the conceptual model presentation will follow, time permitting. Mr. Ceppos asked if the AC could stay an extra half hour past the original meeting end time. A majority of the AC said they could.

5. Technical Memorandum 3 (Se Toxicological Assessment Report)

Dr. Grieb, Tetra Tech, gave a PowerPoint presentation

To view this document go to:
http://www.swrcb.ca.gov/sanfranciscobay/water_issues/programs/tmdls/seleniumtmdl.shtml

Comments from the AC

Comment: (page 4 of presentation) Regarding the slide titled "Effects of Data Analysis on Reported Toxicity Values – Chinook Salmon Example." USFWS will review this as part of their resource trustee mandate to give species of concern the "benefit of the doubt". In other words, the more uncertain the data is, the more conservative the USFWS must be.

Question: Please remind me of the reason that Se is listed.

- It was diving ducks. It's based originally on the health advisory by the Office of Environmental Health Hazard Assessment (OEHHA). It is a heath hazard and the ducks are being impacted. In a broader sense relative to the beneficial uses defined in the Basin Plan, this impact was defined as a wildlife impairment issue and was the subsequent basis to list segments of San Francisco Bay as impaired by selenium on the 303(d) list.

Comment: There wasn't a tremendous amount of data on species indigenous to the Bay. That seems like a disconnect, particularly if that means you will assess impacts based on species that don't historically live in the Bay

- EPA Response. We have to look at surrogate species because many native species are uncommon, there is little to no data available on native species, and USFWS can not use existing populations of Threatened and Endangered species to assess impacts.
    - Al Middleton agreed to follow up on this issue with an email to Ms. Baginska.

Question: I think the clam data is old. Is there new data?

- Mr. Grieb: There is not new information. The clams are potential prey for the target species (waterfowl and sturgeon). Tt knows that a lack of most recent data is a key uncertainty.
- Mr. Roy: We do know that USGS is working on new data that's going to be published.

Question: Is USGS commenting on recent toxicological work on waterfowl? I know they are doing work relative to liver concentrations of birds in the Central Valley.

- Mr. Grieb: The USGS did comment on the toxicological data compiled for waterfowl.

Question: Is it really relevant to look at changes in river concentrations as a means to assess toxicity conditions?

- AC Member Comment. It's very difficult to evaluate a mobile species. Waterfowl have been one of the species affected by Se but given their migration patterns, establishing exposure routes based on residence times is very hard and therefore impacts the certainty of bioaccumulation conclusions.
- Ms. Baginska noted that this is the kind of information she'd like to include.

Comment: I think you are referring to 'Preveglio'. I think you are pointing to a gap in this analysis. There was a source analysis and then a toxicity analysis looking at dietary/ tissue exposure. Both of those are removed from the water. At some point you need to look at all these conditions.

Question: Do we assume the real source is all the Se is soil? Or is it from somewhere else? Could it come from combustion? How do we learn to control it?

- AC Member Comment: We've identified all the known sources. It's primarily coming from the soils along the Coast Ranges. The soil is naturally enriched with Se. Using the land as we do is what made this problem much worse. So yes, it is because of the natural soils here in this area and then how the land is used.

Question: Is it correct to assume that all screening values are for fresh water?

- One included brackish water. The majority of the studies describe freshwater toxicity; only a few studies mention saltwater toxicity/effects; there is an indication that those toxic effects are likely to be less pronounced in brackish or saltwater.

Comment: The margin of safety is 2.5 to 17. -- I think that is an onerous range. We have to consider this when developing toxicity conclusions. How can we address these

different species and how they respond to Se concentrations? Do we want to look at just salmon or other species too?

Comment by EPA: It is important to remember the December 2004 national criteria of 7.9. USFWS said it was still too high. We have to look at surrogate species and I urge you to be conservative because if you expect the criteria to be set higher, that seems unlikely

.

Response: I understand your position but we need to be careful about the targets we pick when all the data is freshwater. This is not a freshwater system.

EPA Response: We have limited data for saltwater or brackish water. Absent that data, to not take a conservative approach means we're risking not being preventive of current and future impacts.

Water Board Response: The TMDL is being done on existing available data because that is all we can do and we take into account all species and conditions in the Bay.

Facilitator Question: When would AC members bring this up for further consideration?

- Ms. Baginska replied that Meeting 3 will offer a good opportunity to discuss this further.
- Mr. Mumley explained that the way the Water Board has scoped the project, includes establishing a target; that is the scope of the project. This will also go down to risk management.

6. TMDL Technical Review Process

Mr. Grieb reviewed the technical review process and the specialists recommended by Tt. The products to be reviewed are:

Technical Memo 4 (Conceptual Model of Se in the North San Francisco Bay)
Technical Memo 5 (Recommendations for Numerical Model Development)
Technical Memo 6 (Simulation Model Results)

Mr. Grieb recommended that the Technical Reviewers include:

Nicholas Fisher, PhD
State Univ of NY
Biogeochemical Cycling

John Oram, PhD
SF Estuary Institute
Numerical Modeling

Regina Linville, PhD
Associate Toxicologist
CA State Office of Environmental Health Hazard Assessment

Sam Luoma, PhD
Senior Research Hydrologist
US Geological Survey

Mr. Grieb asked the AC if they have someone they would recommend. He explained that he'd like agreement at the meeting and will be giving all the participating scientists two weeks to review the documents and that all those listed had confirmed they could work within that timeframe.

Comment: One AC member noted that Regina Linville was originally listed as part of the AC and wondered if it would be better to have her as part of the AC than as a reviewer?

- Ms. Baginska responded that originally, Ms. Linville was expected to represent the State Water Resources Control Board but then she got a position at OEHHA. Ms. Baginska also explained that originally, Water Board staff and the CCP facilitator thought maybe some people would play duel roles (AC member and technical reviewer). However, given her new role at OEHHA, it is harder for her to participate. Ms. Baginska thinks she'll be more valuable as a technical reviewer and she's verified that she can take the role.

Comment: I don't have any suggestions for others but when I read through the resumes I was looking for modelers and I found only one. I think John Oram is an excellent choice. Why didn't you have additional modelers?

- Good question. Sam Luoma, though not a modeler for his whole career, has done a lot of work developing conceptual models and applying models. The TMDL is utilizing the conceptual model that he and others at USGS have developed for selenium in the Bay-Delta. He's also conducted bioaccumulation modeling. We will proposed to incorporate this bioaccumulation model into the modeling framework that we propose to use in the TMDL

Suggestion: Recommend adding Joe Skorupa, from USFWS. Much of his career has been looking at bioaccumulation of Se.

Decision: After discussion, the AC agreed to invite and include Joe Skorupa to the list.

Mr. Grieb noted that although the TMDL and Se issues primarily have to do with aquatic issues, high Se concentrations in birds resulted in the e original listing, and to a large extent bioaccumulation by birds in the Bay-Delta is an aquatic issue. It is uptake by the clams that results in the potential exposure to birds and fish.

EPA cautioned that no one can or should say that one species is more important than another.

7. Preliminary Conceptual Model for Selenium in the North Bay

Sujoy Roy, Tetra Tech, had a PowerPoint presentation and a handout on the Conceptual Model but the presentation was truncated due to time constraints.

To view the slides go to:
http://www.swrcb.ca.gov/sanfranciscobay/water_issues/programs/tmdls/seleniumtmdl.shtml.

Ms. Baginska and Mr. Roy explained that in developing this model, they are looking at various levels of complexity. Not just generic cycling in the Bay but various levels of Se speciation, avian and aquatic species affected, etc. It is a very complex process.

Questions from the AC:

Question: I had the impression that you thought there were fairly significant holes. What will you be using for the model?

- Mr. Roy explained that their best information is from the '99-'00 time period. It often takes 4 to 5 years from the time of data collection to publishing a paper.

Question: Beyond clams, are there other exposure routes that need to be considered as well?

- Mr. Roy said that other tissue data would be helpful but they are unsure if they will have the time or resources to collect such information.

Question: When will the USGS data be available?

- The EPA said that it is in internal review at USGS and it could possibly be available in April 2008.

Question: Do the data sets agree with each other as far as what is in this report and what is in the Central Valley Water Board's data?

- Central Valley Water Board: There is a big gap between Vernalis (most downstream location used to estimate loads from the SJ River to the NSFB) and the discharge points for the Grasslands Bypass Project (further upstream). Pumping at the State and Federal water projects and water diversions complicate the question of how much loading is actually making it downstream into the North Bay. The general message by the Central Valley Water Board is that they are dealing with their own Se issues. There is hydrology data that should be considered and some other data that the Bay Area Water Board may want to take a second look at.
- Mr. Roy: (in response to question) There is no inconsistency. But there could be more data. He said that there is a declining trend, and that is good to know.

8. Next Steps, Adjourn

As the meeting had run late facilitator Dave Ceppos thanked everyone for their time, patience and contributions and closed the meeting.

Attendees:

Advisory Committee	
Bill Beckon	US Fish & Wildlife Svc
Kevin Cullen	Fairfield-Suisun Sewer District
Kevin Buchan	Western States Petroleum Assoc.
Diane Fleck	US EPA
Eugenia McNaughton	US EPA
Al Middleton	Valero Refinery
Michele Pla	Bay Area Clean Water Agencies
Timothy Stevens	California Fish & Game
Jeanne Chilcott	Central Valley Water Bd
Rudy Schnagl	Central Valley Water Bd
Rudy Rosen	Ducks Unlimited
Chris Eacock	Bureau of Reclamation

Members of the Public	
Eric Dunlavey	City of San Jose
Tom Mongan	Consultant to Grassland Growers
Steven Overman	Shell
Terry Cook	URS Corp.
Dave Graser	Tesoro Refinery
Jagjiwan Greword	CalTrans
Rod Miller	SFPUC
Steven Yang	Chevron
Marcus Cole	Valero
Larry Bahr	Oakley Water
Rich Looker	SF Bay Water Bd
Tony Kro	Rhodia
Alisha Wenzel	Central Valley Water Bd
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