

## **Sediment Workgroup December 7, 2009 Meeting Summary**

### **Location**

Tacoma Wastewater Treatment Plant, Tacoma, WA

### **Sediment Workgroup Members Present**

Joanne Snarski, Paul Fuglevand, Lon Kissinger, Glen St. Amant, Teresa Michelsen, Pete Rude, Clay Patmont

### **Ecology Participants**

Chance Asher, Martha Hankins, Laura Inouye, Brad Helland, Dave Sternberg, Fu-Shin Lee, Russ McMillan, Donna Podger

### **Audience**

Jessi Belstom, Port of Vancouver; Gene Revelas, Integral Consulting; Roger McGinnis, Hart Crowser; Heather Trim, People for Puget Sound

### **Agenda**

1. Overall Goals of the Sediment Workgroup
2. Proposed Roadmap – Meeting Topics and Dates
3. Freshwater Sediment Standards
4. Human Health and Background Considerations in Sediment Cleanup Standards

Meeting notes are organized by the agenda number and include a short summary of material presented with a brief summary of the main discussion points. Detailed notes on the discussion are included in an appendix.

### **Acronyms**

AET – Apparent Effects Threshold

AKART – All Known Available and Reasonable Technology

ASTM – American Society for Testing and Materials

BPJ – Best Professional Judgment

CERCLA – Comprehensive Environmental Recovery, Compensation and Liability Act

CSL – Cleanup Screening Level

COC – Chemical of Concern

ESA – Endangered Species Act

FW - Freshwater

MCL – Minimum Cleanup Level

MTCA – Model Toxics Control Act

PCB – Polychlorinated Biphenyls

PLP – Potentially Liable Party

QA – Quality Assurance

RSET – Regional Sediment Evaluation Team  
SMS – Sediment Management Standards  
SQS – Sediment Quality Standards  
SQV – Sediment Quality Value  
TEL – Threshold Effects Level  
TMDL – Total Maximum Daily Load  
TOC – Total Organic Carbon  
USEPA – United States Environmental Protection Agency  
WQ – Water Quality

## Meeting Summary

### 1. Overall Goals of the Sediment Workgroup

#### a. Ecology Presentation

- Ecology said the main goal of this group is to advise Ecology on the scientific and technical issues being worked through. There will be some policy discussions as it is difficult to separate technical and policy issues – sometimes they need to be discussed together. Ecology needs this group's help working through very complex issues that do not have clear answers and are not yet well defined.
- Sediment Workgroup discussions will be summarized and presented to the MTCA/SMS Advisory Group on a monthly basis. Ecology asked the group if they would like to have a member or Ecology present these summaries. It was decided that Ecology could do this for the December 18 meeting, but may need to decide issue by issue if a member would do these in the future.
- No need for consensus among the group – purpose is to advise Ecology and refine our thinking.

#### b. Workgroup Member Discussion

- Workgroup members asked if they could interact with each other outside of the meeting times to discuss issues, brainstorm etc. on the rule revisions. Ecology needs a clear decision on this but at this time we need to ensure that important conversations are captured (in summary form) at the next meeting for all participants to be informed.
- Large, complex issues such as human health/background discussions would benefit from combined meetings between the MTCA/SMS Advisory Group and the Sediment Workgroup. Smaller issues and updates can be reported to the MTCA/SMS Advisory Group by a Sediment Workgroup representative.

## **2. Proposed Roadmap – Meeting Topics and Dates**

### **a. Ecology Presentation**

- List of meeting topics and dates were presented.

### **b. Workgroup Member Discussion**

- Add bioaccumulation in wildlife to agenda in future meetings. May want to have other experts present in audience for that meeting.
- April 15 date won't work – agreement to revise to April 20, 2010.
- Added another meeting to discuss Freshwater Standards tentatively scheduled for January 28, 2010.
- Would like to spend majority of time on human health/background topics.

## **3. Freshwater Sediment Standards**

### **a. Ecology Presentation**

<http://www.ecy.wa.gov/programs/tcp/regs/2009MTCA/SedMtgGroupInfo/SGMtgInfo/SediWGMeetingInfo.html>

- Russ McMillan presented a contextual history of Ecology's development of freshwater values and details about the preferred option that Ecology identified, which includes promulgation of biological criteria.
- Main points from Russ's presentation:
  - Currently only have narrative criteria and some guidance. Results in inconsistency, no predictability for the PLP's, and it's not clear how cleanup decisions are made.
  - The history of development of freshwater SQVs including the work done by Ecology and RSET over the past 12 years.
  - Ecology is continuing the work on development of freshwater chemistry but it is not quite ready for promulgation. Ecology needs to finish the project and conduct internal review.
  - Ecology is recommending moving forward with promulgating biological criteria.
  - Presented chart of potential bioassay tests, QA limits, and endpoints.
  - Still some consideration of what parts of rule to revise (cleanup section only, or SQS and CSL).

### **b. Workgroup Member Discussion**

- Discussion and concern regarding bioassays revolved around use of reference for comparison to test sediments data and quality assurance (QA) levels. Test control data appears to have better reliability than reference; also we need to better understand the challenges with using reference sediments for bioassays. Problems with reference sediments include difficulty meeting QA limits and some areas that should be “clean” consistently show reference failures at the SQS level. Ecology should consider changing freshwater reference area numbers similar to what New York and Michigan did. Revisit changing comparisons to the controls or using higher QA control limits for reference sediments to reduce the number of failed reference sediments (for example, 15 percent mortality instead of 10 percent mortality). The ability to ground truth is very important.
- The proposed SQS interpretive criteria for some bioassays may be too low (for example, the Hyalella 10 day mortality SQS is Test – Reference >10% which may be difficult to discern given potential for high variability). CSL criteria are more reliable as the higher threshold is easier to distinguish from normal variability in the bioassays.
- The proposed approach to developing only biological criteria for freshwater sediments is different from what SMS uses for marine sediments (which have both chemical and biological criteria). Is Ecology considering adopting a similar approach? Ecology would like to adopt both chemical and biological criteria for freshwater but the questions surrounding chemical data are still being addressed. Recent movement towards resolving these shows promise and Ecology is working to incorporate these if they are resolved in time.
- There was concern Ecology needed to ensure the SMS had consistent criteria in all chapters of the rule.
- The SMS needs to have criteria that address various end points for bioaccumulative chemicals ranging from fish, human health, and wildlife protection. Ecology said that we are addressing this issue with the bioaccumulation/ecological risk issue paper. Group suggested this issue and freshwater standards issue may need to be discussed together.
- Ecology should set both freshwater chemical and biological criteria. Ecology said that we are currently considering both but chemical criteria development is still underway and not ready for promulgation. Ecology will continue to keep this option under consideration.
- Consider the longer-term goals of the Sediment Management Standards and sediment cleanups. Focus the group on science.

- USEPA would like Burt Shephard to represent them for the freshwater standards issue because he has specific expertise and Lon Kissinger would represent USEPA on the other issues, most importantly the human health/background issues. The group and Ecology agreed.
- Background could become the driver for freshwater criteria if human health risk numbers are below background.

### **c. Audience Comments**

- Is it possible to get pristine lakes as reference sites? Ecology discussed the recent freshwater reference site study that was conducted. It included pristine lakes and the results were mixed, some failures may have been due to contamination while others may have been due to unknown factors.
- Larval bioassays often fail performance criteria – increase or don't use reference performance standards. Microtox bioassays are not reliable.
- Marine sediments standards should be updated as there have been advances in the bioassay tools since these criteria were developed.
- Some reference sites such as Lake Washington are not clean.” Base reference standards on science not current conditions – reference sites should become cleaner over time.

### **d. Tasks to Complete:**

- Ecology will send a link to the freshwater reference site publication.
- Clay Patmont will send the group information on how other states have dealt with the reference area issue.

## **4. Human Health and Background Considerations in Sediment Cleanup Standards**

### **a. Ecology Presentation**

<http://www.ecy.wa.gov/programs/tcp/regis/2009MTCA/SedMtgGroupInfo/SGMtgInfo/SediWGMeetingInfo.html>

- Chance Asher presented an overview of the issues and considerations for human health and background in setting sediment cleanup standards. The presentation included the details of the two proposed options and advantages and disadvantages of each.
- Main points from Chance's presentation:
  - Background and human health are intertwined issues because human health risk for carcinogens are often below background concentrations.

- Differences between SMS and MTCA – definitions of background, cost and feasibility considerations in setting cleanup standards, decision-making framework.
- Looked at different framework options for setting cleanup standards – 1-tier or range – advantages and disadvantages in flexibility, protectiveness, ability to complete cleanup actions.
- Reviewed area, natural, regional background definitions. How do we deal with the issue of sites being cleaned up to a very low standard if they will get recontaminated?
- Option 1 – MTCA level of protection as sediment cleanup standard ( $1 \times 10^{-6}$  for single carcinogen, natural background). Can go up to  $1 \times 10^{-5}$  cancer risk level for single carcinogen if not technically possible to meet MTCA risk level.
- Option 2 – Conditional Range. Lower end of range is the goal and is same as MTCA level of protection ( $1 \times 10^{-6}$  for single carcinogen, natural background). Upper end of range is “regional background.” Can set cleanup standard above lower level only if not technically possible to achieve goal, or will recontaminate. If will recontaminate, also requires controlling all significant and identifiable sources.

## b. Workgroup Member Discussion

- **Risk Levels:** Could Ecology consider a different risk level than MTCA? Concern was expressed about why Ecology would consider a more relaxed standard than is used at upland sites.
- **Option 2 Conditions:** The Option 2 Range of Conditions, specifically the definition of ‘significant sources controlled’, may slow cleanup. Ecology must understand the repercussions of this phrase and carefully define it.
- **Source Control:** A number of comments were made by the Workgroup about the importance of linking source control efforts with cleanup efforts. Ecology responded that we understand concerns, but scope of the rule change is focused only on cleanup sites.
  - The San Francisco Bay TMDL project was discussed in terms of a potential model for Ecology to consider by combining watershed source control and cleanup to decrease contaminant concentrations and accelerate cleanups.
  - Potential issues could arise if a cleanup standard increases which may result in decreased source control efforts.
  - Concern was raised about changing the framework of the SMS by limiting the rule revisions to cleanup and not including the source

control provisions. What are the implications of doing this? How will it be done and how can it be implemented?

- **Background Issues:** The workgroup discussed many attributes of background – what definition of background is appropriate for sediment cleanup standards, statistical methods when comparing sites to background, background for defining site boundaries.
  - Ecology should consider the idea of using background to define a site versus setting a cleanup standard. Currently, background issues seem driven by the larger sites. Boundary delineation and moving forward on smaller cleanup sites were also concerns. What can be done in the rule to stimulate smaller cleanups?
  - The concept of area background levels versus the site's potential to recontaminate was discussed, including that Ecology should clearly define 'area background.' How would a site be area-weighted to address human health for organisms with larger ecological ranges? What is appropriate for what receptor?
  - The two options Ecology identified may not be different from current practices because of the likelihood that carcinogen risk levels may fall below background. How background is determined is the more important issue, rather than risk levels. Ecology has enough data to determine natural background for Puget Sound and the definition in the SMS should be the same as MTCA.
  - Keep in mind that sediments typically are contaminated by multiple chemicals. Ecology should consider focusing on cleaning up contaminated sediments for other chemicals and not solely focusing on bioaccumulative such as PCBs and dioxin.
  - The issue of statistical approaches and methods to determine background was discussed. Teresa Michelsen handed out a document summarizing a statistical conference held regarding background. The group decided that further group discussion should occur at a high level, specific to what approach is used and where it is used versus statistical details. Ecology responded that they would like to delay discussion of statistics until they have statistical consultant under contract.
  - Concern was raised that a cleanup standard set below area background would not be feasible to sustain and would never be declared clean. Numbers at or above area background are the only feasible option. Another member believes that this issue would be alleviated based on the statistic used to define background and/or how background and site

concentrations were compared. Other members expressed concern about using a higher level to set a cleanup standard.

- Ecology stated they cannot determine Regional Background with existing data which was collected for other purposes. Location of point sources will be important in sampling design, but may not have all point sources identified prior to sampling.

- **Decision Making Framework:** The workgroup discussion focused on the need to incentivize cleanups. If cleanup standards are set too low, or process is too difficult, nothing will get done.

- Making cleanups more timely and predictable for PLPs is important for efficient cleanup and should be incorporated into decision making criteria.
- Incentives for PLPs are an important issue to consider when setting cleanup standards. If the cleanup standard is set too low then less cleanups will be completed due to cost and time spent trying to achieve very low cleanup standards.
- Incentives for early action and well defined endpoints will result in more cleanups and provide incentive for source control.

### c. Audience Comments

- What is a site boundary may change over time.
- Statistical method is a major issue. Ecology statistical guidance is sorely out of date.
- Need to emphasize source control. Can we define a number that gets put into source control program?
- We don't know a lot about how sediment contaminants get into the food web.
- Need to find a way to incentivize cleanup.
- Don't get significant transfer of contaminants from sediment into the water column. Mass input reduction may be more significant at reducing risk than resuspension and transfer to water column.

### d. Tasks to Complete:

- Lon Kissinger will review the human health/background presentation flow charts (slides 27, 29) and provide suggestions on how to potentially simplify the process.
- Ecology will provide links and documentation of: 1) the RSET target tissue values for human health and protection of wildlife 2) the appendix that has details of how those values were generated.

- Teresa Michelsen will provide an electronic copy of the statistics paper to the group for review. In addition, she would distribute her analysis showing that human health risk based concentrations were below background.

### **Issues identified for further discussion**

- How Ecology narrowed down the options.
- Provide a case study to work through the background issue – perhaps the Elliott Bay scenario Ecology developed.
- Have more discussion focused on the two options presented:
  - High level statistical issues.
  - How to define background – natural, area, and/or regional.
  - Areas in MTCA and SMS that may provide more flexibility to reach a lower cleanup standard.
- Other options.
- Decision making criteria.
- Incentives for PLPs.

## **Appendix A: Detailed Meeting Notes as Taken During the Meeting.**

### **1. Overall Goals of the Sediments Workgroup**

- Brief intro FW standards, what thinking is, and preferred options. Discuss get input.
- Overall goals for this group.
- Questions what this group does versus other group.
- No group has different status than the other, but each has different functions. No preferential status. These groups are simply a division of labor to focus on broader policy issues and more technical issues.
- The groups will provide feedback to each other.
- Need this group to help on technical and difficult issues. Cannot separate out technical and policy issues.
- Other group a broader policy group, this group more “roll up sleeves help us figure things out.”
- Larger group will consider how sediment cleanup fits into larger picture – linkages like remedy selection, human health, cost considerations.
- Want to summarize things from this group and bring to larger group.
- No need for consensus – role is to advise Ecology. Do not need to agree. Purpose is to refine our thinking.
- How to communicate with other group – options:
  - Ecology staff could
  - Someone a member of both groups. Select representative to attend other group meeting; maintain balance of perspectives.
  - Someone from this group bring information to other group.
  - Joint meetings, if useful or complex issues.

#### ***Comments***

- Can we schedule time to discuss key items as combined group? Would it be part of other meetings? Maybe – big time commitment.
- Summaries are okay – but also need to present things that have support of whole group – someone should go to full committee and say this has our recommendation.
- Would be good to have a joint meeting – when the human health/background meeting is in process – after two or three more meetings.
- Perhaps a combined approach – regular general summaries, plus comments from this group / presentations if come to consensus.

### **2. Proposed Roadmap – Meeting Topics and Dates**

- Freshwater meeting with larger group before sediment subgroup.
- Bioaccumulation for wildlife is not on the agenda, please add to the agenda.
- February meeting, it may be possible for a meeting on February 1. Let’s revisit this in January. Do not want to extend time commitment of members.

- April 15 won't work for Teresa. Are there any other dates that won't work? January 28 works better, instead of February 1 meeting. We will revisit on January 7 meeting. April meeting is on the 20.
- Revisit order of meeting topics.
- One mega topic – human health/background concentrations -would like to spend 75 percent of time on that topic.
- Members to send meeting topic suggestions to Chance by email.
- Can we send materials to all in the group? Can talk to each other, but if including Ecology – need to send/involve all of the group so don't have privacy issues with Ecology.
- That circumvents public access.
- Maybe we can add these communications to meeting notes. Discuss during public comment period.

### **3. Freshwater Sediment Standards - Presentation by Russ McMillan**

- Lack of criteria – narrative. Have some guidance. Still problems not clear how decisions are made.
- History 1997 – first set of SQVs, picked up again in 2003 by Ecology.
- Teresa spent a lot of time evaluating reliability of the AET approach and other approaches in North America.
- Data still lacked desired geographic scope, range of chemicals. Difficulties in selecting reference stations and performance of references in the methods.
- Still best available science and used case by case.
- 2007 – RSET (Oregon, Idaho, Washington) focused on Sediment Evaluation Framework for dredging disposal.
- Targeted resolution of 2003 data problems, triple data set, but still missing some Eastern Washington and Idaho areas.
- Reliability testing for floating percent looked at data from east and west of Cascades.
- Lot of reliability testing- looks at minimizing false negatives and positives
- Still continuing discussion whether floating percent or other methods is way to go.
- Still continuing discussion about level of protection (organism versus community).
- Is an Oregon versus Washington issue; Oregon discussing with management.
- Question about predictive ability of different bioassays and endpoints.
- Questions about specific changes in statistical performance of some QA benchmarks – do the numbers need to be changed?
- Should we look at lowest effects level for SQS, or bump up to second effects level for SQS.
- There are 10 effects levels for freshwater, whereas in marine there are only 4. Big difference.
- Different levels of rigor between derivation of freshwater endpoints and marine standards.
- Freshwater bioassay tests should be extended to other sections of the rule.
- Where are we now? Ecology reviewed Sediment Quality Guidelines progress – still in progress.
- Is RSET looking at the marine standards? Level of review seems to have changed from 20 years ago.

- On our wish list to update marine standards. Considered other bioassays in 1999, but work that was done in preparation for that didn't seem like something we could continue on now. So has fallen by wayside.
- Technical clarification floating percent are not necessarily AET, sometimes the same, sometimes MORE conservative than AET. Moved away from AET for freshwater because didn't work for metals under variable bioavailability. Work in marine systems because they are buffered.
- Recognize inconsistencies between marine and freshwater, with no effort to merge into an equal and comprehensive set of standards.
- No, not there at this time.

### *Options*

- Promulgate chemical, biological, or both. Clarify where in SMS they will be used.
- Range of test organisms and end points. Darker rows (on slide) are chronic endpoints.
- If change cleanup part – change source control part too.
- If include freshwater standards in other parts – will have to be reviewed/approved as USEPA.
- Question how does ESA review fit in?
- RSET had the review – no affected organisms on Endangered Species Act (ESA) list – but fish aren't included in evaluation. ESA for benthic covered - fish not.
- Freshwater standards have same issue as marine – what about human health, background, upper trophic levels?
- Add background, human health, and bioaccumulation to list to be addressed.
- Which one are recommended for 10 day versus 28 day, but question about quality assurance (QA) limits. We all agree on reference sites, but still half of the samples won't meet QA. Not uncommon. What to do about QA failures of reference sites?
- RSET used comparison to controls. Need to determine cause(s) of reference failures, otherwise the interpretation of the tests is questionable.
- Could not get consistently usable reference sites in Oregon and Washington. Used controls – so at sites, use controls as well as reference sites.
- Slippery slope to propose this unless can explain why the test fails at reference sites.
- It is a serious problem, but need to focus more on comparison to control rather than comparison to reference.
- Develop comparison to control in rule.
- Bigger problem – conclude that no difference between control and site because of ref failures.
- What are alternatives?
- Maybe some tests are most reliable than others.
- Trouble with methods proposed that can't demonstrate reliably work.
- What do you mean? We've done reliability tests.
- You can't take a property that is "clean" – can't pass the test. You can't ground truth it.
- If everything fails, let's go in with eyes wide open.
- Is this what is being proposed? Even hearing from Teresa that references fail is a concern.
- Many projects didn't have reference data, not just reference failures.

- Is there anything fundamental in standards on reference versus control?
- Construct is written as separate section in marine rule, but won't necessarily dictate what we do in freshwater standards.
- May need to clarify endpoints ref versus control.
- In practice if now, if reference fails, compare to controls. Not written in rule, but described in SAPA, done on BPJ case-by-case. Also have option to override small failure of reference.
- Is the problem with reference areas, are there contaminants everywhere?
- Tried to find places as far from contamination as possible. Some studies have chemicals data. Depends on which bioassay test and other factors.
- Did look for best reference areas, but difficult in freshwater systems. Go upstream – completely different TOC, grain size – variability in freshwater systems difficult.
- Look at reference areas – have never found a contaminant to explain mortality. Doesn't mean it's not there. Argument for natural toxins, seasonal natural variations. My recommendation is if we haven't figured that out – put in a narrative that we recognize that there may be wide areas with reference failures, guidance how to deal with that situation.
- On specific criteria for performance criteria of reference sites – this has 10 percent, but other states are using 20 percent. What is basis for using 10 percent?
- The 2002 Volume 1 describes how it's derived – regulatory issues as well as ASTM recommendations. Intralab studies, power studies:
- Lot of sites (reference sites) fail SQS by just a little bit – some states deal with that with little different values – lot of dialog about 10 percent or 20 percent values
- Homework for Clay to bring more info about what is being done in other states.
- Difficult to identify reference areas – picked really clean areas, but still had issues with bioassays.
- Need to determine causes of failures; otherwise the interpretation of the tests is questionable. Can chemical screening criteria be devised (in rule or guidance) to rule out stations/sites, even if reliable freshwater chemical standards cannot yet be promulgated?
- Coming up with standards protective for animal. Clients have to spend \$100,000s on uncertain standards. Needs to be some acknowledgement of too conservative numbers – taken too serious and site managers that won't budge. Need to acknowledge uncertainty. If you can't pass this test at reference sites – is it ready for regulation? People have to spend life savings on uncertain tests.
- What is alternative? Incredibly conservative chemicals guidelines tend to get applied instead. 10 percent compared to control – may want to up to 15 percent. Reliability goals were 80 percent reliability (maximum of 20 percent false positives and 20 percent false negatives) – 3 tests that didn't meet that were the 3 short-term mortality tests – makes sense – small effect at small time range. 15 percent might be better
- May want to revisit sediment quality standards (SQS) comparison to control – 15 percent instead of 10 percent especially for short-term mortality tests. Other tests didn't find reliability problem at either.
- Depends on whether dredging project –use SQS – cleanup sites use cleanup screening level or CSL. Reference performance at CSL levels are very reliable.
- If look at TEL – have 80-90 percent false positive, but these 20-30 percent false positive - much better than what's being used.

- If it's not predictive don't use it for SQS – can still keep it for CSL.
- Are there other things we need to address?
- Goal is for better consistency – bioassays are significant step for that
- Another issue – what are we talking about for facilitating/slowing down site identification or cleanup decisions. They are expensive, if they are only tool – maybe more difficult to use. More expensive for cleanup. Chemical criteria would be beneficial to streamline, make affordable.
- Recognize a lot of projects won't want to have to do all bioassays – would prefer to do chemical screening.
- Bioaccumulation, human health, protection wildlife – bioassays are only a partial answer. Does Ecology have a statement?
- All good things come to those who wait.
- Do recognize that human health, ecological bioaccumulation is a hole – trying address in some level in those issue papers.
- Bioassays trump chemistry data – how do you determine what COC are? What do you clean up? What do you monitor for? How does this fit in site cleanup process.
- Can use chemical gradients with bioassays at a site. If struggling with just one of those. Definitely enhanced when you have both. Going to have to do chemicals with bioassays.
- Going to have to come up with a site-specific correlation.
- Always an option to analyze for chemicals, even though numbers may be guidance not criteria.
- Had this problem – just bioassays – can have bioassay contours like chemicals contours. Have done this at sites in Puget Sound – especially when have mix of wood waste, petroleum, etc.
- Is it useful to have guidance with screening criteria so can rule out some sites?
- Having criteria will stimulate cleanup, uncertainty & inconsistency slows things down, problem is to get it right. Cost impact – probably going to collect chemistry data either way. Good to have screening criteria to rule sites out.
- Would be helpful for group to see freshwater sites reference data.
- Dave can provide link to report on website.
- Hybrid idea – if don't have chemicals criteria – guidance on how chemicals are looked at to make sure appropriate endpoints are looked at – combined bioassay, chemistry data.
- Jan 28 good to continue this discussion– give time for Ecology to have internal discussion, can have a proposal for freshwater standards.
- Would like to have Burt Shephard at USEPA look at this issue.

#### *Audience comments*

- Is it possible to get pristine lakes as reference sites? Rivers change – scour, deposition – look more closely upstream rather than way upstream. Bioassays – most experience in marine – larval tests are ones that most often fail performance criteria – increase reference performance standards OR don't have any reference performance standards, Microtox not a good test – fails for no reason, passes when should fail.
- Have an issue about Lake Washington being clean – total maximum daily load (TMDL) for PCBs – not clean. This should be based on science not current conditions because rule will stay for 10-15 years. As system improves, reference sites should become cleaner – don't want to see

reference areas become less stringent. That things will be improved will be factored in – should be based on science. (Workgroup response: Reference sites – some very clean sites are still not passing, or barely passing SQS bioassays. We may have made a mistake in setting reference pass criteria – set too close to natural variability.)

- This committee needs to focus on science not other issues.
- Are we going to be elaborating how we are going to address higher trophic level species? Also may be missing some expertise in this room to address this issue.
- We have identified a hole in SMS that we aren't protective of bioaccumulation; need to address somehow. Need to have that discussion. This group has settled membership, but they can attend as audience members. Great suggestion, how do we do that?

#### **4. Human Health and Background Considerations in Sediment Cleanup**

##### **Standards**

##### **Comments**

- Are you thinking about temporal changes in background? Background can creep up - or down over time as sources are controlled.
- How do you define significant sources? Ecology recognizes this is an important issue. Defining the phrase needs to be worked through.
- What about regional background sources not related to the site? What if you can't control them?
- The best approach is to do area-wide cleanups instead of site-by-site – phased approach that includes source control.
- Is there any option for relaxing Ecology risk ranges? TCA and WQ standards are based on  $10^{-6}$  but MTCA has options for going to  $10^{-5}$ .
- In MTCA lack of flexibility in cleanup standards is compensated in remedy selection and use of institutional controls.
- Scales for human health (beach play or bioaccumulatives), ecological bioaccumulation, benthic are different.
- Specifying the point of compliance in the flowcharts could address questions of scale. Sediment standards could apply to an area versus a point concentration.
- Key issues are PCB and dioxin. In flow chart – going to go right to “identify and control sources” – this is the absolute biggest issue.
- Impossible for agency to get to low risk goal without doing source control. Need to recognize agency goal for risk and realize how sediment cleanup fits into that picture.
- Source control is the biggest issue – maintain the low goals but understand the limitations of sediment cleanup.
- Look at San Francisco Bay TMDL- concluded that goal was to get to 1 ppb dry weight PCB – which is 10 ppb in fish. Primary way to get this is source control. Ongoing sources are primary contributors, sediment is secondary. Primary tool is aggressive 4-phase source control program. Watershed source control is the way to get to the goal. Cleanup goal of 1 ppb can't be met in short-term, so set realistic short-term goal – if site over 180 ppb – goes to

cleanup program. Looked at setting bay-wide cleanup level, but decided better to do site-specific determination of cleanup goals.

- Watershed source control is important.
- Anywhere in Puget Sound – PCB and dioxin are above  $10^{-5}$  risk level, even for low consumption rates.
- We should measure which option really accelerates achieving the goal.
- Don't understand why you would have different risk level than upland. Why would we accept higher risks? This goes to the question of regulatory framework and how risk is managed when protective concentrations cannot be maintained.
- What about using background to set site boundaries versus setting cleanup levels?
- Want tie of regional background to conceptual site model. What is relevance of sources, resuspension?
- Sediment quality objective (lower tier) always remains the objective.
- Every carcinogenic chemical is below background in Puget Sound – based on RSET work. Teresa will make analysis available to all. Risk level is irrelevant – background is the key issue. Option 1 with  $10^{-5}$  just collapses.
- Need to revise SMS non-anthropogenic background. Propose to use natural background as lower level, regional background in urban bays when appropriate.
- If cleanup site-by-site to regional background – what then? Need a more thoughtful approach on how to get to goal than just standard site-by-site approach.
- If get wrapped up by the dioxin/PCB issue, sites don't progress. Might be benefits to cleaning up other stuff even if can't get all the way to the cleanup standard for those chemicals. If don't take action until get to a low number – wouldn't get anything done. Can focus on making progress on other chemicals as well.
- What can be done to address source control?
- If make it all or nothing – may end up with nothing.
- Interim actions can significantly reduce risk.
- To determine regional background would need studies. Existing data collected for other purposes, can't get defensible number from existing data. Scale of the studies may be problematic.
- Is there variation in urban areas? Difference between Seattle, Tacoma? May have problem finding locations away from point sources – don't know where all the sources are. Regional background concept is helpful in urban areas.
- Will come down to selection of statistics, type 1 & type 2 errors, hypothesis.
- Are mega-sites the only way we are going to do cleanup? How would someone clean up smaller sites?
- How would you do site boundary delineations?
- Scale is important – how does a hotspot fit in with larger areas when looking at exposure from bioaccumulatives. Are there methods for area weighting? What about variable organism home range. Area weighting more relevant to the consumption pathway.

- If we follow the path of Lower Duwamish, we will stop doing work. The hallmark of MTCA/SMS has been non-CERCLA sites. These proposals may put the brakes on good cleanups.
- If we don't know what regional background is, we don't know how this is going to work.
- Potentially liable party (PLP) can't understand why we set Sediment Cleanup Standard below area background – will just recontaminate. This is a source control issue not a cleanup issue. Need practical standards that can be achieved – that is at or around area background. Spend a lot of money for something that maybe will recontaminate, maybe won't.
- Has to be above area background to make cleanups happen.
- With the CERCLA overlay – takes 20-40 years to do a project.
- If want to truly do cleanup, need a short-term cleanup goal and a long-term objective that includes source control.
- If cleanup a site and then document that recontamination is from other sources, are they liable? Yes, if it is on their property – but in reality often taken into consideration in final decision- don't usually hold innocent landowners responsible.
- Some things could be addressed by what statistical method used for the upper bound estimate.
- Area weighting concept foiled by flawed sampling design.
- Have struggled too much to identify fish home range – need to say – here's the level that we want in tissue and set the sediment target. Fool's errand to go after home range.
- Have to look at urban areas on a watershed basis – and set goals on a larger scale.
- Need some concerted thought on how to approach urban areas. Need low risk protection goals to drive source control improvements.
- How do you incentivize cleanups versus how to get the cleanest cleanup? Nothing happens if there is no incentive to get involved in starting on a cleanup.
- Would be interesting to study pay-off point – what cleanup level would get the most cleanup done? Maybe give amnesty if clean up to a reasonable number, such as method cleanup level (MCL) or two times regional background. Set cleanup levels too low, cleanups don't get done. Cost just to go through the process is huge.
- Need to look at performance monitoring for human health cleanup standards – look at tissue concentrations.

#### ***Audience comments***

- What is a site boundary may change over time.
- Statistical method is a major issue, ecology statistical guidance sorely out of date.
- Need to emphasize source control. Can we define a number that gets put into the source control program?
- We don't know a lot about how sediment contaminants get into the food web.
- Need to find a way to incentivize cleanup.
- Don't get significant transfer of contaminants from sediment into the water column. Mass input reduction may be more significant at reducing risk than resuspension and transfer to the water column.

*Next meeting topics*

- Want to understand process of selecting options, what was considered.
- Would like hypothetical case studies.
- Would like some focus on discussing the two options put forward.
- Summary points of this meeting
- How to provide incentive for early actions – partial settlements?
- Discuss decision framework.