East Waterway OU

Anthropogenic Background Meeting #4 Meeting Notes

Participants: EPA, East Waterway Group (Port of Seattle, City of Seattle, and King County), Muckleshoot Tribe, Suquamish Tribe

October 7, 2020; 11 am - 1 pm

Meeting	Purpose	Materials (Prepared by EWG)	Outcome
#4 Available information review: LDW laterals, LDW bedded sediment, and EW laterals	Review available data from EW and LDW lateral loads and LDW bedded sediment to the EW.	Description of collection/testing approach and summary of data sets, number of samples, summary statistics.	Identify how available data can be used to develop AB.

Meeting Materials

Anthropogenic Background Meeting #4 presentation (pdf)
Urban Inputs in Anthropogenic Background Guidance and Other Documents (pdf)

Attendees

EPA

- Ravi Sanga
- Kira Lynch
- Elizabeth Allen
- Erika Hoffman
- Sean Sheldrake
- Shawn Blocker
- Elly Hale
- Karl Gustavson
- Silvina Fonseca
- Karl Wilson

USACE (on behalf of EPA)

- Bill Gardiner
- Kayla Patten

Suquamish

- Denise Taylor

Muckleshoot

- Glen St. Amant

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East Waterway Group (EWG)

- Brick Spangler (Port of Seattle)
- Joanna Florer (Port of Seattle)
- Kathy Bahnick (Port of Seattle)
- Jeff Stern (King County)
- Debra Williston (King County)
- Pete Rude (City of Seattle)
- Allison Crowley (City of Seattle)
- Nate Hart (Cite of Seattle)
- Merv Coover (ERM on behalf of the City)
- Dan Berlin (Anchor QEA on behalf of EWG)
- Greg Brunkhorst (Anchor QEA on behalf of EWG)

Meeting Notes

Dan Berlin: [Roll call]. Ravi or Kira, would either of you like to provide an introduction?

Ravi Sanga: this is meeting #4, although it is the third meeting because we skipped #2. We appreciate having this meeting. We have some skepticism with the laterals but we will be listening and looking closely at the presentation

Kira Lynch: I have nothing to add.

Dan: we all decided to move forward with this meeting after the discussion we had with EPA about lateral inputs last meeting. We agreed to continue with the meeting series as originally planned. The next meeting will cover data sufficiency.

Ravi: we will have a segue at the end of this meeting into the data sufficiency meeting.

Dan: [Slide 2 Dan reads the agenda]

[Slide 3] From the meeting series, the primary agenda is to identify how lateral data can be used to develop anthropogenic background [AB]. The secondary purpose that is important for EWG is to document what affects EW concentrations in the long term, even if they cannot be used in the AB determination.

[Slide 5] This slide reviews the CSM from previous presentations with the addition of urban inputs that affect all of the inputs to the EW. Atmospheric deposition contributes minimally directly to the East Waterway, but is more significant in the EW and LDW lateral basins and in the basins that channel that deposition into the EW and LDW. Green River is 99% of the solids load into the EW, EW

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laterals is 0.3%, and LDW laterals and bed is 0.8%. The question for today is how to account for urban inputs in determining EW AB.

[Slide 6] Slide 6 shows some considerations for how to use lateral data in developing AB. EWG recognizes that some basins are still undergoing source control, but that other basins are already controlled. In addition, EWG recognizes that source control sufficiency is a requirement prior to the EW and LDW cleanups, which will involve EPA determining that sources have been adequately controlled before any in-water cleanup happens. We also recognize that urban inputs are best represented by inputs following source control, which has not yet been completed. We don't have to answer now, but the question for consideration today is how can we calculate post-source control given the data we have. This is something to think about as we move through the presentation.

[Slide 8] Slide 8 shows the land use from EW and LDW lateral drainages and upstream Green River above RM 10.4 at Foster Links Golf Course. The EW and LDW lateral drainage basins are 21,000 acre basins, of which 61% is commercial/industrial (about 13,000 acres of commercial, industrial, and right-of-way), which is more developed than the Green River, which is 68% natural resource, parks, agriculture, and open space. The EW and LDW lateral drainage basins have a longer history of industrial development. We have a lot of good information on the Green River, but that basin doesn't have the extent of urbanization compared to the EW and LDW drainage basins.

[Slide 9] This slide shows the outer extent of EW and LDW drainage areas, which is defined by the CSO basin.

[Slide 10] EW has 3 CSOs and 41 storm drains [Dan reads the slide].

[Slide 11] The table shows the EW CSO land use. Hanford #2 and Lander have overlapping basins and are combined in this table, which represents 99% of the CSO basin areas. Hinds CSO is small compared to Hanford #2/Lander. Note that CSOs discharge only in large storm events, and when they do discharge, approximately 90% of the flow is stormwater. These acreages are rounded.

[Slide 12] Here are the CSO basins; Hanford and Lander CSOs have overlapping basins.

[Slide 13] This is a similar summary of EW storm drains. Lander street SD is over half of the storm drain basin area, which is mostly commercial/industrial. The Port nearshore drainage areas on the terminals on both east and west sides of the EW are more than 1/3 of the total area and 100% industrial. Different than the CSOs, storm drains discharge during all storm events.

[Slide 14] The figure shows the storm drain basin areas, including Lander, Port terminals, Coast Guard, Hinds storm drain, and Olympic Tug and Barge.

[Slide 15] The slide provides another view of the storm drain basins showing aprons and outfalls more clearly.

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Ravi: this is a great summary of EW sources, and good for headquarters to the see. But we are expecting all of these to be controlled.

Dan: that's right Ravi, that is correct. We expect to go through a source control sufficiency process with EPA to demonstrate that these sources have been adequately controlled prior to any sediment cleanup takes place.

Jeff: I'd like to clarify that in the EW FS, CSOs and storm drains were defined as pathways, not sources. We are trying to control sources that get into those pathways.

Dan: [Slide 16] here is a similar summary for the LDW. Like the EW, the drainage basin is large, with numerous discharge locations, including both discharge points and ditches, creeks, or streams.

[Slide 17] this slide shows the land use [see correction statement below] in drainage basins for LDW, with the outer extent represented by CSO basins and storm drainage basins within the CSO drainage areas.

Debra: Dan, this is showing the storm drain basins and creeks in the colored areas, rather than land use, for example the Hamm Creek drainage is shown.

Dan: that is right, these are drainage basin types rather than land use types.

[Slide 18] to summarize storm drains, 61% are part of the City of Seattle municipal storm drain system, 24% is King County or City of Tukwila, and the remaining 15% is privately owned.

[Slide 19] There are 10 CSOs in the LDW and 5 emergency overflows (EOFs). Jeff, can you explain the EOFs?

Jeff Stern: EOFs only discharge (overflow) during a mechanical failure; they are largely pump stations, whereas CSOs can discharge during large storm events.

Elly Hale: are 5 EOFs that remain to be controlled inclusive of the 10?

Jeff: no, they are separate

Elly: I had a question previously. What do you mean by "urban inputs" in the earlier slides?

Dan: last week with the agenda and these slides, we sent around a list of excerpts from guidance documents from EPA, ASTM, Sediment Management Work Group, and the Navy. AB is defined as inputs affected by anthropogenic activities not related to the CERCLA release. "Urban inputs" has not been defined clearly in EPA guidance, but this is our term to summarize the anthropogenic contributions described in the documents.

Elly: thanks

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Erika: I have a question about the definition of pathways rather than sources. Are you saying that 5 sources to be controlled or that all sources will be controlled?

Jeff: that is a good question, there are two separate definitions of source control. For CSOs there is a specific definition of CSO control from the state of Washington that is defined as 1 overflow event per year on a 20 year average. All CSOs are required to meet that condition by a certain time period. 5 of the 10 CSOs are below that level and 5 remain to be controlled to that level. That is separate than the source control in the basins to control inputs into the combined system that could discharge through a CSO.

Erika: that is helpful. When you were differentiating between CSOs as a pathway rather than a source, did you imply that basin sources themselves are not planned for control? Is that correct?

Jeff: no. When we defined the CSM in the EW we defined releases/ sources, and pathways. Storm drains and CSOs are pathways. An overwater release would be both a pathway and a release. That's the way they are defined in the FS, and we look for sources to the pathways.

Erika: for the 41 storm drains, are you saying there are no plans for source control?

Debra: no, there are source control activities in all the basins. There is more to come in the presentation on that.

Kira: I don't want to get too hung up on this. These are questions that will be asked with source control sufficiency as part of the remedial action and design process but not necessarily things that will be affecting AB.

Dan: let's move along and discuss source control work, which will answer some of your questions, Erika.

[Slide 21] There are source control activities under the Clean Water Act as required under NPDES permits. All lateral basins have these activities happening [listed on the slide]. Activities include source tracing, CSO control projects, and stormwater management. For example, there have been level 3 corrective actions for stormwater permittees that have occurred in both LDW and EW, including in Terminal 18 where a treatment system was recently installed.

Debra: does the Port or the City want to add anything?

Nate Hart: nothing really, just that we have a lot going on, inspections, line cleaning, source tracing, spill response, but the high-level stuff is covered on this slide.

Debra: [Slide 22] KC Industrial Waste Program targets industrial facilities to treat wastewater to reduce harmful substances or use best management practices (BMPs) before discharging wastewater

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to sanitary sewers.. It regulates facilities in the drainage basin, and includes business inspections, collecting samples either by KC Industrial Waste or by facility per their permit requirement. The permits can cover industrial process water or industrial stormwater runoff.

Jeff: In the 1950's all industrial releases to the waterway, were required to be sent to the sewers. In 1968 when the municipal wastewater treatment plant was constructed, the Industrial Waste Program was started to address pre-release treatment of industrial wastewater.

Debra: The Local Hazardous Waste Management program includes household hazardous waste collection, public education, small quantity generator technical assistance, small quantity generator waste collection, and targeted outreach to communities and businesses It includes site visits and subcontracting with ECOSS to provide spill kits, spill plans and training, and is another way to manage and reduce hazardous waste in the basins.

Jeff: the purpose of the program is to keep hazardous waste from going down the drain or getting into stormwater.

Dan: other source control activities include air programs to curb emissions over time, which address atmospheric deposition in the basins. Upland cleanups have also been implemented which continue to control sources. We don't have any upland cleanup sites that are known to be an ongoing source to the EW.

Then last bullet is most important. The LDW and EW cleanups have driven source investigations within basins to identify and control sources. There has been success and progress in source tracing in the basins. We will get to a point in the future where EPA will determine that sources have been adequately controlled. Cleanup site-driven source tracing is additional work above and beyond permit-driven work.

Pete: back on Slide 21: I would like to point out that BMPs, including sweeping, line cleanouts, catch basin cleanouts, can be huge efforts with significant costs. For example, most if not all of the Lander SD line has been cleaned out, and represents a lot of effort and work. It is two words on a slide but it represents a big effort.

Dan: it's true, a lot of time and effort and money have been spent in this work.

Any questions? [none]. On to the data summaries.

Nate: [Slide 24] We use a variety of techniques to sample our systems. Inline sediment traps are traps left in place for months or up to a year. Inline solids are a collection of settled materials in the pipe bottom, using a cup and stick to grab a sample from within the line itself. Catch basin solids grabs are samples on private property or in the right of way, closer to potential sources. We sample

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near the end of the pipe then as we move upstream tracing to sources, we end up sampling catch basin solids to get closer to the source of the contamination.

Dan: data from all three of these sample types have been pulled together for the data summaries, there has been years of data collection, and some information gets updated as new data comes in. Inline traps and grabs represent the larger basin, but catch basins represent more localized areas.

[Slide 25] This is the LDW lateral loads from the LDW Data Evaluation Report [DER], this is a comprehensive summary, we are not predisposing anything on AB here. In the DER there was a process to remove higher concentrations to see how the statistics change.

Debra: we have a lot more samples than are shown, but we have screened the data, and this shows screened samples.

Dan: Debra, screening included removal of samples after being resampled to represent the most current condition?

Debra: it is a little more complicated; we focus on in line samples closer to outfall, and if there is time series we use all data, unless there has been a line cleaning, source control action, or product substitution and then we use samples collected after that event.

Dan: this is the best estimate of current conditions.

Ericka: where does the 2,000 ppb cutoff for total PCBs come from?

Debra: this was selected to show how the statistics would change, based on what is practicable to trace. I believe 1,000 ppb is used to trigger source tracing of City storm drains.

Nate: Correct, 1000 ppb is the source tracing trigger

Elly: were there any samples above 1000 ppb?

Debra: it looks like about 20 from the slide

Nate: I can think of three locations in the EWW and 9 or so locations in the LDW.

Dan: [Slide 26] this is the CSO and SD summary for the EW. This data was summarized in the FS, and there has been additional data that has been collected, which is summarized on the next slide. This slide shows statistics for CSOs and SDs separately and combined.

[Slide 27] the slide shows the data that has been collected since the FS, but the data has not been combined and consolidated down with the FS data for the purpose of making calculations. Some of these additional samples are after line cleanings and source control activities that could result in changes to the numbers presented on slide 26.

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Debra: we have a detailed process for evaluating data to understand the best estimate of solids coming out of our system. We have many years and types of data like, sediment traps and catch basin solids for both LDW and EW sites. We collect these data to evaluate source control status in the basins, to trace sources and help us determine source control sufficiency. For purposes of FS, we reviewed data to apply chemistry inputs for use in FS modeling.

For source control work, we evaluate what sample types are better reflective of the entire basin, or in a localized subbasin. These include what sample types are better reflective of discharge from pipe, what reflects known sources, what source control actions have occurred. All of these are considered when screening data. If sampling has occurred tracing a particular source, we consider which source control actions have happened. For example, a 1,4-dichlorobenzene source was traced to urinal cakes, we got the business to do product substitution, and we did a large line cleaning event to remove those legacy inputs to the system. We also look at subbasin characteristics – types of industries, size, land use, age of development; some basins may have different inputs.

If this data could be used for urban AB input, that same sort of assessment would need to happen, as we wouldn't want to include known sources or site releases; we'd want to select what is representative of AB. What we have found is that basin characteristics and source control activities need to be considered. We would want to work together with these data, because we who are close to the data know the basins and source control actions best. Based on our experience working with lateral data, we feel urban inputs from EW and LDW laterals will differ from the Green River but not necessarily for arsenic.

Erika: I get it, that is helpful. Of course for me, the details make me uneasy and nervous, the rest of the presentation might allay that concern, but I get the logic.

Debra: for folks that are not close to this data, we know there is a screening that needs to be performed to use this data.

Dan: we have one more slide on the LDW bed. LDW bed is a small portion of what goes into the EW. We present two pieces of data: baseline from 2018 and the LDW FS study predicted concentration 25 years after cleanup. We recognize that what is out there now will not be out there in the future conditions, but we wanted to present the data that is available. It would be hard to say that the data are sufficient. However, we wanted to present the information so we all have the same understanding of the urban inputs and the data that are available so we can think about if we have enough.

Elly: I'm not Allison Hiltner and I wasn't involved with the LDW FS, but we have expressed reservations about the model predictions after cleanup. We should be cautious about using model data.

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Dan: any other questions before we move onto the sufficiency discussion?

Bill Gardner: a question about the lateral datasets. The challenge is that we have sources. Is there a meaningful part of the existing data that could be used for AB, has there been an exercise to go through the datasets?

Debra: we have started the process but not completed it. However, there will be data left to be useful after screening.

Jeff: another way to think about it, is the process was sort of done already. The DER did go through a similar assessment of what would be ongoing. When samples over 2,000s are removed, the average is whittled down to a number in the 400s. Doing the same evaluation to the EW dataset would result in similar reduction to represent urban inputs coming in. But there is a fairly large sample number to start with, especially if the LDW and EW data are combined.

Debra: if we are able to consider this line of evidence, we would be looking at making an assessment that would assign a value to EW and LDW laterals because they all share similar urban drainage basins. I would want to ask Ravi and Kira what the next step in the process would be so we can decide if we need to dive into the lateral data to determine if we can establish urban anthropogenic inputs outside of a controllable source.

Kira: when Elizabeth goes through our thinking on data sufficiency, it will answer your question. This is a very small percentage of what would be considered in AB. We need to look at if it is something that is necessary considering uncertainty associated with it and whether it should be added in instead of using a more straightforward approach.

Debra: if we are able to do this, we would combine the LDW and EW laterals because they have similar urban drainage basins. What would our next steps be to see if we should dive into the dataset to see if we can pull out the lateral data for an allowable input.

Kira: this is good information. But in context, because this is a small portion of the inputs to the EW, is may not be worth the uncertainty to include if there are more straightforward approaches. Maybe you can do a sensitivity analysis if you want. The next part of the meeting will help to answer this.

Ravi: I agree

Dan: [Slide 31] now we want to hear from EPA on what materials EWG can prepare to support a productive meeting on data sufficiency.

Elizabeth: As I was listening and watching the presentation, you guys spent a lot of time and effort, and you want more info from us. I was getting frustrated during the discussion of the LDW bed, as it is a negligible input to EW, and it is from an existing as-yet unremediated NPL site. The vast majority

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of the input to EW is suspended sediment from upstream. That dataset isn't huge. How would you incorporate laterals as that data swamps the upstream dataset?

Debra: laterals wouldn't be combined with Green River data, but would be applied to a separate input weighted to the solids percentages from the CSM.

Elizabeth: How much time and effort do we spend on something that is almost no measurable input? If there is an argument that it is a measurable input, I have not seen it.

Several of us at EPA have gone through datasets you've provided. Based on the conceptual model, the most important input is suspended sediment. Both USGS and King County have done various data collection efforts and a good amount of temporality in that data. The King County study looked at that info in various watersheds, which is interesting, which may be giving some idea of where some of the higher concentrations are coming from. But what is coming into the upper end of the LDW Site is the best estimate of suspended solids data. The most relevant data is at the golf course. Using USGS spreadsheets and summary statistics of KC data (I don't have the spreadsheets), looking at PCBs, there are 40-some samples collected over various years and various flow conditions. It's not a particularly variable dataset; it seems pretty controlled. We think that's probably the most useful data to start working with. That's probably the best example of what's going into EW.

We could spend a lot of time getting wrapped around the axle on a lot of different things, but none of this affects the remedy that will be implemented. Helpful to understand how inputs are relative to how contamination that is left in place will affect long term concentrations.

It is not the most robust dataset, but it is statistically robust enough to do decent calculations and establish an estimate. Any value will be an imperfect estimation, but there will be monitoring and post-construction long term concentrations will get to the value regardless of whether we nail this value now. What we may set as AB in a decision document really primarily serves as the trigger point between short-term and long-term monitoring.

We think it is worth a shot to use this data to calculate an anthropogenic background value. I think the EW group has probably evaluated the data and has some ideas and we would be interested in what you think because there is a lot of knowledge and skill.

Debra: for County data, we can provide all raw data. There is not a database posted on the County website, but there are pdf copies. We send the data to people if requested. Ecology has all County PCBs data in the database for the Pollution Loading Assessment.

Merv: Debra are you referring to the King County Green River data?

Debra: yes. Elizabeth, do you want the full congener dataset?

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Elizabeth: yes, total PCB and congener would be helpful.

Jeff: Elizabeth is probably trying to get at the comparability of the datasets, so may need to rectify comparability of datasets.

Elizabeth: USGS provides their summing method, but whether we use that method is open to discussion. If we have raw congener data itself, we can use those.

Debra: we do have congener data and we used EPA method 1668 the same method as USGS

Kira: do you want to share about what form we'd want to see it in?

Bill: it would be helpful if we had excel datasheets for USGS and King County studies that include percent fraction fines, concentrations for PCB, As, D/F, method used to collect them, dates of collection, type of event (baseline, storm, dam, storm+dam) in one place. It could be multiple sheets on a file. The other thing we should discuss at the next meeting is what Jeff alluded to: different types of collection methods, short term, long term, and whole water. Can water data be used, corrected? Some samples are baseline, some are storm-related. We would like information on how interchangeable the data is, and if not, how could we use it to come up with AB?

Elizabeth: Some data is baseline and some is storm. I don't see a dramatic difference between baseline and storm, even though the flow is different.

Debra: When we have TOC data, do you want that as well? Do you want lab qualification flags?

Bill: yes to both

Debra: congener data is by IUPAC #. Ecology EIM names them one way. Axis Analytical names them another way. As long as they shake hands?

Elizabeth: I understand relational databases, but I never rely on CAS #. As long as we know that if it's PCB-177, we know it's PCB-177

Debra: some are co-eluters, and it depends on analytical column.

Ravi: didn't we want different events to be kept separate?

Bill: we should know what the different events are. There is a difference between dam release and other events. Can leave up to EWG to keep them as separate tabs.

Debra: a column can be added to sort and query

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Bill: we want to know how to deal with sediment traps vs instantaneous filtered solids samples. It would also be helpful to have Flaming Geyser; we will ultimately use data at Foster Links, but it is still helpful to compare. How to weight flow conditions? Does other data inform decisions?

Elizabeth: there will be discussions on how to apportion data to different conditions, and we would want your input on that. We know there will be a degree of uncertainty, but can we develop a reasonable number.

Merv: the concept of a range of a values for AB had been floated by a member of the EPA team. Is that being considered?

Elizabeth: I didn't mean we would calculate a separate statistical background value for high flow conditions vs low flow conditions. But we could calculate moments on the statistical distribution.

Merv: I get the sense that upstream dataset is "sufficient" to do this comparison. Have we crossed the threshold that we have sufficient data, or is the jury still out?

Elizabeth: when we do the calculation, it depends on how good the underlying data is and if there is enough data to do statistical calculations on. The data spans a several year temporal timeframe, so that's informative as well. The bigger the dataset you have, generally the lower uncertainty. The question is whether EPA feels the uncertainty is OK so that we can come up with a value that's reasonable? Besides just our opinion, there is uncertainty with a dataset of this size, and what would EWG think of that? We may think it's OK, but EWG may feel like some things are missing. Regarding the odds of those two values being the same, statistically we can bound that, but in reality, it is hard to say. If EWG is OK with potential uncertainty of this dataset; from my view, it's definitely OK to take a much closer look at the data.

Pete: are the requests of EWG to supply the data per se, and EPA and the team will start doing the crunching? Is that how the labor is being sorted out here?

Elizabeth: I'm not in charge of this, but Bill and I have taken the closest look at this. There is a lot to be worked out. How do we incorporate different flow conditions; to what extent do other datasets like sediment traps influence the calculations or inform them. For discussions on PCB congener data, risk-based PCBs are based on Aroclor data. So summing PCB congeners is important, as they don't exist in some of the Aroclors. Congeners get into non-detects, and how to sum. Those are fine details to be worked out. I never intended to do that in a vacuum and EWG can help with the best way to deal with these issues.

Ravi: EPA wants to take a look at the data and do a little more evaluation to develop guidelines for process, discuss with the tribes, and share the process/number crunching with EWG at a later date.

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We want to take a look at the data and do some evaluation on our own with the tribes. Denise or Glen, do you have anything to add?

Glen: nothing to add at the moment.

Denise: nothing new to add at the moment.

Debra: this is all really helpful. What do our agenda topics look like for our next meeting? We will compile datasets. Topics include collection methods, different conditions, how they represent AB. What are other topics for the next meeting?

Ravi: Elizabeth or Bill, what do you want to see?

Elizabeth: At the start of my soliloquy, I said that you have been looking at this data for a while. My suspicion is you have an idea of what you want to do with this data. The entire EPA team wants you to share which data is most important and how you intend for it to be used.

Debra: I assume part of the conversation at the next meeting is what is suspended solids vs sed traps vs water and what would that represent?

Bill: We don't want to get ahead of ourselves and start calculating a value, but look at what the data is and is it sufficient to establish AB value? We have ID'ed locations and media for what we are trying to do. Let's pull that data for what we're trying to do, and next meeting let's talk about different data types, events, and how would we parse those out. What information we have, how many datasets, data collection. I don't know if we have a joint meeting to determine if the data is sufficient, which may be more a question for Kira and Elizabeth.

Kira: how do you combine or consider some of the issues with the dataset so that you present that to us. We are interested in how you would resolve focusing each dataset that we have identified and the statistics we would look at. Further we can get into that discussion with your thoughts, the more we can move through this process.

Greg: is bedded sediment out, or are we still keeping bedded sediment around?

Elizabeth: From where?

Greg: From Green River

Elizabeth: Which data sources are really relevant is what gets into EW. Clearly you have opinion on that, but that's the kind of thing we'd like to hear from EWW on how and to what extent that info should be used.

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Bill: from the presentation from last time, it didn't sound like storm events or dam releases pick up bed load from the Green River in any meaningful way. Bedded sed is not a major driver, but even if it moved downstream, it would most likely settle out in LDW. Based on unknowns and likely contribution, seems like not including it makes the most sense.

Elizabeth: yes, good description. If that assumption is incorrect, what is the information that shows that it does have a meaningful contribution to the EW.

Debra: you are on the right track there of what we are thinking about.

Jeff: thanks for thinking we have already figured this out! We have been thinking about the upstream dataset for a while now, and we can certainly lay out our thoughts of what we are thinking about the different datasets. At some point, we need to decide what other datasets will be analyzed and/or summarized to provide background and support of our thinking.

Elizabeth: that's really helpful. We can calculate a statistically defensible dataset based on 10 samples, but generally that doesn't well represent the population. We can go into the weeds, but before that, let's keep in our minds how it will ultimately be used and to what extent getting into the weeds is going to change the ultimate decision and what are the ultimate consequences of what we calculate.

Merv: those are important. Along those lines, in discussion between Kira and Brick and Dan a while ago, there is the possibility that the data could be re-evaluated. How does that influence the sufficiency of the dataset? Would you be able to accept some uncertainty considering that?

Kira: what are we going to use this info for? What will be the use of AB? It won't influence the remedy, the RALs, or alternatives. It's primary purpose is short term vs long term monitoring decisions. Sufficiency decisions should have a significant impact on whether this is good enough for what we need.

Dan: our next meeting is in two weeks. We have to do this work in the next two weeks and we will regroup and decide what we can provide ahead of time.

Ravi: can you use a fileshare?

Dan: we can use the EW sharepoint site

Ravi: please send out login info for share-site. Ecology will not be participating in future meetings, but they want to be kept on the distribution. Keep the staff from the original meeting notices on meeting distribution materials. In terms of data, you can provide that to EPA and the tribes. Glen and Denise, anything you want to see at next meeting?

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Glen: nothing specific now

Denise: me neither

Ravi: Dan, please send around username and password info

Dan: may provide one login info for each organization who can then download it and share internally. If you have any other ideas, then let us know in advance of the meeting.

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