



GREEN-DUWAMISH POLLUTANT LOADING ASSESSMENT TECHNICAL ADVISORY COMMITTEE

TECHNICAL ADVISORY COMMITTEE MEETING #7

- April 6th, 2016

Tukwila Community Center
12424 42nd Ave South,
Tukwila, WA 98168

TAC PARTICIPANTS

- Ryan Larson, City of Tukwila
- Kevin Buckley, Seattle Public Utilities
- Shawn Gilbertson, City of Kent (on phone)
- Kristen Kerns, Corps of Engineers
- Elissa Ostergaard, WRIA 9
- Joanna Florer, Port of Seattle
- Jana Ratcliff, Washington State Dept. of Transportation
- James Rasmussen, Duwamish River Cleanup Coalition
- Heather Trim, Duwamish River Cleanup Coalition (on phone)
- Greg Pelletier, Ecology Environmental Assessment Program
- Jeff Stern, King County

ADDITIONAL MEETING PARTICIPANTS

- Ben Cope, EPA
- Laurie Mann, EPA
- Becky Chu, EPA
- Chris Zell, EPA
- Mark Dagel, Hart Crowser
- Curtis DeGasperi, King County DNRP
- Debra Williston, King County DNRP
- Ben Star, Interpro Consulting
- Erika Morgan, City of Black Diamond
- Sara Burdick, Washington State Dept. of Transportation
- Joan Nolan, Ecology Water Quality Program
- Rachel McCrea, Ecology Water Quality Program
- Mahbub Alam, Ecology Toxics Cleanup Program
- Ron Timm, Ecology Toxics Cleanup Program
- Danielle DeVoe, Ecology Water Quality Program
- Dave Garland, Ecology Water Quality Program
- Bo Li, Ecology Water Quality Program
- Jon Butcher, Tetra tech (phone)
- Brian Watson, Tetra tech (phone)
- Todd Kennedy, Tetra tech
- Rick Schaefer, Tetra tech

WELCOME AND INTRODUCTIONS

Joan Nolan welcomed the TAC members back and went over housekeeping items and introductions which included attendee's joining via phone. Attendees joining by phone were Jon Butcher (Tt), Heather Trim



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(DRCC), and Shawn Gilbertson (City of Kent). Joan reviewed the roles of the TAC and gave an overview of meeting goals and objectives. Prior TAC meetings occurred between December 2014 and July 2015. Today's primary objective is to introduce and review the draft modeling QAPP.

OVERVIEW OF PROJECT STATUS AND DRAFT QAPP

Rachel McCrea gave a brief overview of the PLA project. The PLA was kicked off late 2014 with 2 main goals: address CWA obligations, and support the Lower Duwamish Waterway (LDW) sediment cleanup by minimizing recontamination. She explained that Ecology's Water Quality Program is able to prioritize toxics in the Green/Duwamish watershed as a 'TMDL alternative' approach based on EPA guidance and in part due to the extensive existing work already going on to clean up the LDW.

Based on feedback from the TAC in 2015, the Ecology and EPA project team developed a phased project plan. Project phases, over a roughly 10 year period, are based on planned additional data collection efforts (e.g., as part of the Superfund cleanup), logical model development tasks, and potential future availability of funding. Rachel noted that the Superfund-related baseline sampling in the LDW will be completed before the PLA builds the toxics components of the models. In addition to the model development tasks, the project will involve a PCB congener assessment, the development of a project database to support the modeling, initial empirical loading estimates based on existing data, and amendments to the modeling QAPP to reflect the additional details necessary to guide future model development phases. Refer to handout.

Rachel explained that due to State funding shortfalls connected with the MTCA accounts, the previously planned Ecology funded projects have been delayed. For example, the USGS field work to collect and analyze suspended sediment and ambient water quality samples at River Miles 11 and 6 has been suspended. Funding priorities for Ecology's Toxics Cleanup Program are being reassessed. Ecology's Water Quality Program has dedicated \$200,000 every 2 years to support the PLA project. TAC members briefly discussed the status of USGS funding to maintain the flow gages at these locations; should Ecology have funding available, the Project Team and Steering Committee has identified support to the gages as the 2nd priority for Ecology's Water Quality Program funding. The PCB congener report (i.e., a primer regarding PCBs), PCB congener database and associated congener assessment have been delayed but are expected to continue once funding is resolved.

Laurie Mann provided an overview of project funding from EPA. EPA has established Tetra tech's contract through 2018; even with the money shortfall it is still fully funded through 2017. The contract includes the initial modeling QAPP development, hydrology/hydrodynamics model setup for LSPC, and developing a project database to support model development. EPA's Regional Water Program has zero discretionary dollars. EPA Region X has successfully secured funding from Headquarters cleanup program and water programs) to fund PLA efforts for the last three years. Laurie mentioned the Superfund-Clean Water Act partnerships developed by this project are important to EPA nationally and has sparked a lot of interest. Things that take priority funding and could take away EPA funds include: Congressional funding, environmental disasters in other regions, and litigation.

TAC member feedback included:



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- Concern that the 2017-2018 budget will create a difficult funding scenario given other state obligations.
- Concern that the PLA model development timeline will not allow the PLA to be used to assess whether sources to LDW sediments are sufficiently controlled such that in-water construction of the sediment remedy in the LDW can begin.
 - Rachel clarified, in response to this concern, that the PLA was not intended to be used for “source control sufficiency” evaluations. Source control “sufficiency” is aimed at controlling sources enough so that the active in-waterway cleanup (i.e., dredging, capping) can occur with a low likelihood that sediments will recontaminate above the Remedial Action Levels. Based on ambient data collected at River Mile 11, pollutants from the upstream Green River are not expected to recontaminate LDW sediments above the Remedial Action Levels. The PLA, and upstream pollution control efforts, are necessary however to support attainment of LDW sediment cleanup levels and Clean Water Act designated uses. It could also be used to help assess the success of monitored natural recovery portions of the Superfund Cleanup.

Joan then turned the presentation over to Ben Cope with EPA to give an overview of the Draft Modeling QAPP.

Ben noted that QAPPs are required by EPA policy, but this one is unique. The scale and difficulty of modeling work, level of stakeholder engagement this early, and amount of communication with Tetra Tech, and updating the QAPP mid-project are all aspects of this project that are unlike others in the past. Ben went over the benefits of a good QAPP and the clarity it provides. He stated this will be a long project, so the QAPP will also inform new people that will be coming into this project. Feedback from stakeholders is requested. The QAPP is intended to be updated again in a few years and periodically, if necessary, throughout the project.

Bo Li with Ecology announced if there are a lot of comments and concerns on the QAPP, Ecology will have another meeting in the summer to go over comments and concerns. She reminded the TAC that April 29th, 2016 is the QAPP comment deadline and the presentations will be available on the PLA website. Members of the TAC asked about the response to comments procedure. This is an informal public comment process, so Ecology will not do an official “response to comments” document. Bo stated the QAPP is a living document, no formal response to comments will be provided, but feedback given will be discussed internally with the project team and responded to at the next TAC meeting. Some feedback may be more appropriate for future modeling QAPP revisions.

QAPP – LSPC MODEL

John Butcher (phone) presented on the LSPC watershed model. The model simulates water flow, sediment, and toxic pollutants in the watershed. The HSPF models were used in the past by King County – 17 of them will be combined into one LSPC model which will provide better overall refinement. The new model will be extending the boundaries to reflect drainage from Seattle and capture direct stormwater that goes to the LDW. The model will also be using King County 2007 land use data. Tetra Tech won't



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model the upper watershed but will get flow info from the USGS gage and water quality data to characterize the load at the model boundary (Howard Hanson Dam). Upstream sources are not expected to be a major source of pollutants compared to the rest of the watershed.

New LSPC model details:

- The model timeline is being extended through 2016; it only went to 2009 previously.
- Hydrologic calibration timeline is 20 years; 1996 through 2016.
- Flow is continuously measured at multiple gages
- Water Quality calibration will focus on seasonal variation
- Model will simulate toxic pollutants for the first time

There are still questions about how to best represent precipitation and evapotranspiration in the model. John then went on to discuss the sediment transport model calibration, including key factors such as bottom shear stress and erosion rates. The current model has limited information on sediment loading rates traveling through the water column.

John reviewed the next steps with calibration and showed example findings from the Black River/Springbrook Creek model. The Black River/Springbrook watershed had several gages. King County compared model data to observed data and found the model is doing a reasonable job of tracking flow, but tends to underestimate some of the stream peaks. The model over predicts flow in winter and is under-predicting summer flows. Tetra Tech can use this information and errors in the simulation to improve the model. Sheer stress with cohesive sediment (silt and clays) was also modeled. The existing model for suspended sediment was rated good to poor depending on the station. Next step for the LSPC model development are: the draft QAPP needs approval, and they are assembling information, such as meteorological data.

Q & A:

Question: LSPC will be done in 2016, will sediment be measured/calibrated in 2016?

Answer: Sediment calibration will be done after the hydrologic calibration.

Question: Are you incorporating climate change hydrology into the model, especially for future predictive uses as things change?

Answer: No, but there are a lot of information that will/can be used to predict climate change impacts. Climate change considerations would typically be treated as a scenario to run through the models once developed. A meteorological time series could be done and added to the model eventually.

Question: Please revisit/clarify model evaluation and calibration/validation.

Answer: In reality, the model is not testing a hypothesis, but rather we are trying to create the best model possible given available data. Instead of a two step calibration process (aka calibration and then a validation model run), we will calibrate the model to all of the data in one step. This is a common practice.

QAPP – EFDC MODEL



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Brian Watson (Tt by phone) presented on the EFDC model and focused on aspects of the EFDC receiving water model. The model will provide a dynamic representation of conditions and take into account tidally influenced waters, water flow, velocity, and water surface elevation. Brian went over planned refinements to the previous EFDC model in more detail. Instead of simulating both black and organic carbon, the model will adjust contaminant partition coefficients based on research under USACE funded MIT study in the LDW. The modeling grid was updated; extended up to RM 17 – tidal boundary. Vertical model layers will include 10 water layers and 5 sediment layers. To account for dredging activities, they will calibrate the model for smaller time period and change the bathymetric dataset. Atmospheric deposition inputs will rely on already available data. EFDC will be linked to other models, for example, outputs from LSPC model (flow, sediment load, contaminant load) and outputs from CSO model. Calibration sequencing will be similar to LSPC – first, hydrodynamic model, sediment, and then WQ parameters. Calibration will be conducted in 2 steps: same as LSPC model, visual comparison and fine tuning the parameters.

Q & A:

Question: Provide more explanation on the black carbon and using USACE-funded MIT study information to adjust the partitioning coefficient.

Answer: Information on three phase partitioning is not available, so two phase partitioning (between water and solids) will be used from information already developed. When it comes to black carbon, not all are equal. The type of black carbon depends on the source, and we have a lot of sources from LDW. Our recommendation is to take and tune the partitioning behavior with empirical data obtained from the site through the study.

Question: What kind of temperature data will be collected along with this? UW has done temp profiling. Any temp modeling going to happen?

Answer: The project focus is on toxics but the model does track temperature. Existing data such as temperature will be used in the model; temperature is relevant to toxics because it affects the vertical distribution of pollutants. It is difficult to obtain data collected as part of academic studies until that study is published.

Question: With the maps to be produced, will it be possible to predict rates of sedimentation at restoration sites and inform small embayments & off-channel habitat as well as other places where people will be dredging?

Answer: Yes, if the model grid cell covers the areas. The model should inform wherever there are modeling grid cells at play.

Question: Are sediment loads part of calibration parameters? Please clarify.

Answer: The goal is to take sediment loads from LPSC and put them in different size classes as part of calibration.

QAPP – FOOD WEB MODEL & DATA MANAGEMENT

Tetra tech presented on Food web model: building from previous work by LDWG. LDWG targeted species if they were receptors of concern or prey species of receptors of concern. Many equations will be used to demonstrate the effects on tissue concentration. Inputs into the Food web model (FWM) are EFDC model outputs. Model calibration will focus on observed vs. modeled tissue concentrations. Examples were



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shown of previous work and datasets/calibrations. Data compilation and database development are expected to begin next year.

Q & A:

Question: While the FWM will focus on species that spend their lives in the watershed, given WRIA 9's salmon recovery focus, could there be a role in the FWM on evaluating the effects on salmon?

Answer: Salmon don't spend enough time in the LDW, which is why they have yet to be included in the model. It might be possible to describe the average incremental contribution, but the steady state FWM isn't designed to do this. It could be possible to include a subclass for juvenile salmon that spends a certain life stage in the LDW/Elliott Bay, if they did in fact spend that life stage in the LDW/Elliott Bay.

Elissa Ostergaard commented on a recent study by WDFW: Juvenile chinook collected at the mouth of the LDW had levels of PCBs and PAHs high enough in the tissues to affect their survivability. The fish collected a month later in Elliott Bay had even higher rates. WDFW will be partnering with Puget Sound monitoring programs to do additional sampling in additional watersheds.

Question: How will the species selection in the food web model be decided and when?

Answer: The Project Team will add this to the project work plan as a topic for discussion at the TAC and possibly future QAPP revisions.

COMMENTS FROM TAC

Question: With all the modeling that has been done, why not rely more on existing modeling instead of having to re-do and re-calibrate, especially in light of the challenges in funding a project over a decade?

Answer: We are taking old models and making them better, not necessarily re-doing everything. It's about how efficiently you adopt the old models and move on.

Question/Comment: The criteria for use of secondary data that is going to be input into the model is not clear in the QAPP. There needs to be more discussion on the quality of data that is going to be used in the model and what it is going to result in. Not all the data was collected with regulatory intent. There also may be inherent errors in the data that are then used in the model.

Answer: The QAPP has some general DQO language but we can consider adding to it. We do not plan on spending time reviewing QA procedures for trusted data sources like USGS and Ecology; that would not be a wise use of resources. This is a modeling QAPP, not a field investigation/data collection QAPP. DQOs are not the same for a modeling QAPP as for data collection QAPP.

COMMENTS FROM GENERAL AUDIENCE

Question: What will be the use of the food web model? Post remediation conditions?

Answer: Yes, it is one of the expected uses. Not intended to be used in short term applications.

Question: What other variables need to be included in the model to represent toxics?

Answer: They include temperature, total organic carbon, salinity, and pH.

Question: Language of QAPP is about objectives of project and efforts in identifying issues, however it does not talk about the statement of intent. Is it meant to be empirical or scientific? The QAPP seems to be "light" on objective criteria of dataset being used. Others chime in with concern on questions about what the proposal can deliver.



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Answer: The data used has clear acceptance criteria that are part of different QAPPs (the QAPP used to collect the initial data). For the model, it is important to understand that excluding data leaves a gap in the modeling effort. Best professional judgment is used on which data to include in the modeling.

NEXT STEPS

Bo: For Ecology's funding, the PCB Congener evaluation is near term next step if the funding is available. The modeling QAPP will be modified and updated based on comments from the TAC. Due by April 29th, 2016. There may be a meeting in June/July depending on feedback on the QAPP. A September meeting will describe the LSPC hydro model.

Question: To provide good comments, they need an understanding on data & model performance objectives.

Answer: Performance objectives include getting the model as good as we can get it with the best data available. We do not have numeric criteria for model acceptance in the draft QAPP, because we cannot predict upfront the uncertainty/error in the model predictions. Ultimately, management decides whether model uncertainty is acceptable in the decision making process. Uncertainties of the data & model will be documented and presented to decision makers. The Project Team will consider expanding the discussion on data quality and performance objectives in the QAPP.

Question: Can the intended use of the model be provided to the group?

Answer: A discussion of management scenarios may help this issue. This was a planned future step but can be moved up to satisfy TAC's interest in use of the models.

Meeting adjourned at 12:10 pm.

Project Team Action items:

- Put together draft management scenarios for intended use for future TAC discussion.
- Make sure a future TAC meeting discusses FWM species.

TAC homework:

- Identify and provide any additional hydrologic data that TT may use.