

January 5, 2018

Lisa Dally Wilson and the Spokane River Stewardship Partners

RE: Response to comments from SRSP on the 12/12/17 revised draft of the Spokane River PCBs and Other Toxics at the Spokane Tribal Boundary: Recommendations for Development of a Long-Term Monitoring Plan.

Dear Ms. Wilson,

Thank you for the comments from the Spokane River Stewardship Partners. I appreciate these comments and have made additional changes to the final report, which has been published on Ecology's Website at <https://fortress.wa.gov/ecy/publications/SummaryPages/1703019.html>. Below are my specific responses to your comments.

1. I agree with the comments regarding the general difficulties with measuring PCBs in ambient water. The following language was added to the Background Section of the report to address this concern:
 - a. **Challenge of Measuring Low-Level Organics in Ambient Waters**

“PCBs are generally difficult to measure with certainty at the concentrations found in most ambient water bodies in Washington State. The Spokane River is no exception, especially in Little Falls Pool where surface water PCB concentrations are likely to be low relative to upstream.

Even when detected in surface water, PCBs are often detected in comparable concentrations in the laboratory method blanks and field blanks associated with the sampling event. Determining the environmental concentration above the sampling system noise (which includes both possible contamination from the analytical laboratory as well as from collection techniques) can prove challenging.

Results from the 2014 and 2015 Spokane River synoptic surveys and mass balance assessments conducted by Limnotech for SRRTF were considered to be ‘semi-quantitative’ due to significant variability in the data resulting from low levels of PCB in the river and relatively high levels of PCBs found in the lab blanks and transfer blanks (Limnotech, 2014, 2015, 2016). The grab samples for the surveys were collected via direct immersion where the lid to the sample container is opened and the container filled under water to avoid contamination from contact with the ambient air.

Special collection methods such as CLAM and XAD-2 can be used to pre-concentrate PCBs and other organics by filtering high volumes of water (20 – 40 liters) through media that sorb both the particulate and dissolved fractions, effectively concentrating all of the organic chemical. If ambient concentrations of a chemical are low, concentrating the chemical can lead to more detections. However, similar to grab sample collection, pre-concentration collection methods can contribute contamination to samples. In some cases, the collection equipment can be a major source of contamination. A recent study conducted by King County found that the silicone tubing used for auto sampling contributed significant PCB contamination to surface water samples analyzed for PCBs (Williston et al., 2016).

In summary, unless a given sampling system has been thoroughly tested to show that it is contaminant free, the environmental results generated through the sampling system should be considered qualitative or semi-quantitative, but not quantitative.

- b. The following language was added to the *Data Quality* Section:

“Due to significant PCB contamination from the CLAM sampling system (i.e., from the SPE disk housing), high levels of PCBs in the transfer blank for the XAD-2 samples and an unknown level of PCB contamination from the 2 liter composite samples, all surface water PCB data for the study should be considered semi-quantitative. CLAM PBDE data should also be considered semi-quantitative due to background contamination from both the laboratory and the SPE disk housing.”

- c. The following language was added to the *Results* Section for PCBs and PBDEs:

PCBs

“Due to the PCB contamination in the CLAM sampling system, high levels of PCBs in the transfer blank for the XAD-2 samples and an unknown level of PCB contamination from the 2-liter composite samples, all surface water PCB data for the study should be considered semi-quantitative.”

PBDEs

“As with PCBs, PBDE CLAM data should also be considered semi-quantitative due to background contamination from both the laboratory and SPE disk housing.”

2. Good comment.

- a. The following language was added to the *Assessment Criteria* Section:

“The surface water criteria for PCBs shown in table 5 are for informational purposes only. Surface water data (CLAM, XAD-2 and the 2-liter) are considered to be semi-quantitative and will not be used for formal assessment of attainment of water quality standards.”

3. Changes were made to the first bullet in the conclusion to address comments regarding the semi-quantitative nature to the PCB surface water results.

- a. Language was changed to:

“The mean of seasonal total PCB concentrations in surface water for the study ranged from 63 – 87 pg/L at the upper Spokane Tribal boundary monitoring site (Union Gospel Mission dock) using three collection and extraction methods: 2-liter, CLAM, and XAD-2. Although the surface water results are higher than the Washington State Human Health water quality criterion (7 pg/L) and the Spokane Tribal water quality criterion of 1.3 pg/L for total PCBs, the results are considered to be semi-quantitative and will not be used for formal assessment of water quality criteria attainment.”

4. No changes were made to the second recommendation of continuing the use of CLAM for surface water monitoring. Recommendations to switch from a high-density polypropylene SPE disk housing to a stainless steel one have already been made. I am confident that we are dialing in our use of CLAM for low-level toxics monitoring of surface water. We are currently developing an SOP for use of CLAM and the Assessment Methods for Low-Level Contaminants Study will be published by Will Hobbs in 2018. The Low-Level study will provide additional data for several waterbodies regarding the accuracy and precision of the CLAM with stainless steel SPE disks.

5. I discussed the other monitoring methods that you mention (SMPE, PE and POM) with my colleagues and from what I understand these methods may also have limitations in their ability to produce “more quantitative results.” I admit that I don’t know much about these other methods though and will do some research to become more familiar with them. Additionally, we have invested a fair amount of time into the CLAM sampling method and I feel confident that we will be able to use it successfully for future low-level organics monitoring given the improvements that we have already made.
6. Agreed. The congener patterns found among the different matrices is very interesting. I would like to know more about how fish exposure pathways as well. I will keep this in mind as I develop our Spokane River biofilm PCB monitoring QAPP this winter. Stay tuned.
7. We fixed the grammatical errors in the second paragraph, first sentence, under the Background section.
8. Yes, sediment traps are a useful monitoring tool. Additional sediment monitoring would be interesting as well. If we were to conduct surficial sediment monitoring, it would be good to include the same sites monitored in 2003-2004 for Ecology’s Source Assessment (Figure 2 in the report).
9. Mentioning the Low-Level study results is important because the samples were taken at the exact same location at the UGM site using CLAM, but with the improved stainless steel SPE disk housing which significantly reduced the PCB contamination from the disk housing that was a big issue for the Tribal Boundary study. The Low-Level study was also mentioned in Objective #2 of the Tribal Boundary report and also in the QAPP due to its relevance. Though the Low-Level study is unpublished, it was conducted under an approved QAPP and the report is currently in-draft by Will Hobbs from the EAP Toxics Studies Unit.

Response to summary:

I understand the concerns that this study was not very robust with respect to precision and accuracy of PCB measurements in the water column. It was not the goal of the study to provide robust surface water data with high precisions and accuracy. The goal was to test monitoring methods at the site in order to inform the design of long-term monitoring program for the site.

This study will not necessarily set a precedent for future monitoring at the Spokane Tribal boundary in terms of numbers of environmental and Quality Assurance samples, as we would want to make sure that we had a robust and statistically sound monitoring program before we moved forward. However, I do think that the CLAM with stainless steel SPE disks has a lot of promise for measuring low level PCBs at the site.

Thanks again for your great comments. The final report is a better product because of SRSP’s input.

Respectfully,

Brandee Era-Miller

Dept. of Ecology – Environmental Assessment Program