Scope of Work and Budget
Expanded Synoptic Survey/Artesian Well/Catch Basin Sampling
May 13, 2022 Draft

Background

This scope of work addresses three individual priority activities identified by the Task Force to help identify previously unidentified sources of PCBs to the Spokane River: 1) an expanded synoptic survey and mass balance assessment, 2) monitoring of PCB concentrations in the artesian well discharging to Mission Reach, and 3) sampling of solids from catch basins located in the Springfield stormwater basin. These three activities are merged here into a single scope to provide efficiencies in terms of field crew deployment and development of quality assurance program plans.

Expanded Synoptic Survey: The Task Force has sponsored three separate synoptic surveys of PCBs in the Spokane River designed to support mass balance assessments and identify previously unknown sources of PCBs. These surveys have been largely effective, but several questions regarding unknown sources still exist. The Task Force has already approved a synoptic survey of the river between the USGS gage and Nine Mile Dam to address one key question regarding the magnitude of unknown loading in that segment of the river. This subtask expands the original spatial coverage upstream to Plantes Ferry. The purpose of the expanded spatial scope is to:

- Provide better spatial resolution regarding where unknown loads may be entering the river between the USGS gage and Nine Mile Dam
- Define the magnitude of unknown loading occurring in the Mission Reach
- Help provide an explanation for the observed shift in in-river homolog patterns between Trent Ave/Plantes Ferry and Greene St.

Artesian Well Sampling: Ecology staff previously identified a continuously flowing water source (informally called an Artesian Well) located on the south bank of the Spokane River between Hamilton St and Spokane Falls Blvd. Gravity Consultants was contracted by the Task Force to sample this discharge in 2021. The resulting concentration was 2100 pg/l, which is an order of magnitude greater than typical PCB concentrations in the river, indicating that this discharge may be a previously unconsidered source of PCBs to the river. Because only a single sample was taken in 2021, there is some uncertainty of how representative this sample is of overall conditions. The purpose of this subtask is to collect additional samples from this discharge in order to confirm the elevated concentration observed in 2021.

<u>Catch Basin Sampling:</u> The Task Force sponsored deployment of a trained PCB detection dog in 2021 to identify potential areas of PCB contamination in riparian areas of the Mission Reach. Certain catch basins and drywell sites in the stormwater drainage area were detected as potentially having elevated PCB concentrations. The results from deployment of the PCB-detection dog do not provide definitive evidence of PCB sources contributing to the Mission Reach contamination. The purpose of this subtask is to take the next step towards assessing the significance of the areas identified by the PCB-detection dog regarding PCB delivery to the Spokane River, by sampling PCB in solids collected from stormwater catch basins in the area. The PCB concentrations measured in the catch basins of interest will be compared to historical PCB concentrations measured in other Spokane-area catch basins to determine whether the identified areas are delivering PCBs to the Spokane River at levels higher than those being delivered by other areas in Spokane.

Scope of Work

Work will be covered via nine tasks:

1. Preparation of QAPP
2. Development of scopes of work
3. Field planning and coordination
4. Synoptic survey
5. Mass balance assessment
6. Artesian well sampling
7. Stormwater catch basin sampling
8. Reporting
9. Data uploading

Task 1: Preparation of QAPP

LimnoTech will prepare a draft quality assurance program plan (QAPP) in accordance with Ecology's "Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies" covering all three project activities. The draft will be submitted to Ecology for review and revised into a final version incorporating all comments.

Task 2: Development of scopes of work

LimnoTech will prepare draft scopes of work detailing contractor responsibilities and budget for use by the Task Force's Administrative and Contracting Entity (ACE) in developing contacts/purchase orders related to this work. Separate scopes and budgets will be developed for:

- Gravity Consultants: Performance of all three monitoring activities
- SGS AXYS: PCB laboratory analysis for all three monitoring activities
- SVL laboratories: Conventional pollutant analysis for the synoptic surveys
- LimnoTech: Development of QAPP, field monitoring oversight, data validation, data assessment, reporting, and uploading of data to EIM.

Task 3: Field planning and coordination

Synoptic Survey: Gravity Consultants will identify the specific locations to be used for the new sampling stations, ensuring that they are both safely accessible and amenable to conducting stream flow measurement. This task also covers coordination between Gravity and LimnoTech regarding the exact timing of the initiation of the survey, Sampling will be conducted during the summer low flow period to minimize potential confounding effects of wet weather sources. The initiation of monitoring is designed with the intent to capture ideal conditions if possible, yet ensure that monitoring be conducted during the low flow period. The commencement of monitoring will be determined in a manner as consistent as is possible with the following guidance:

- Flows in the Spokane River at Spokane (Gage 12422500) are less than 1210 cubic feet per second. This flow represents the median August flow from this gage.
- One week has passed since the last rainfall greater than 0.2" was recorded at Felts Field. This sampling plan recognizes that it will be infeasible to design a monitoring program where the

influence of wet weather loading is completely absent. The requirement of a one-week antecedent dry period balances the desire to minimize the presence of wet weather-driven sources with the desire to ensure that the required conditions will occur during the summer of 2022.

- The local weather forecast contains no days with a predicted likelihood of rainfall greater than 50% for the following three days.
- Should the above conditions not occur before August 22, sampling will commence on August 22. This will ensure that low flow monitoring will still be conducted, prior to stream flows increasing in September.

Catch Basin Sampling: Gravity Consultants will coordinate with staff from the City of Spokane in terms of the specific timing of the catch basin sampling, along with any relevant logistical issues.

Task 4: Synoptic survey

Gravity Consultants will collect grab samples in accordance with the Standard Operating Procedures listed in LimnoTech (2014). Samples will be collected for five consecutive days during summer low flow conditions at the river stations shown in Table 1. Stream flows will be measured for each sample (excluding field replicates) collected at each location where a flow gaging station does not currently exist.

Table 1: Spokane River Synoptic Survey Sampling Locations

Station	**Comments**
Plantes Ferry/Trent Avenue	Existing SRRTTF station SR7
Above Upriver Dam	New station
Below Upriver Dam	Existing SRRTTF station SR5a
Greene St.	Existing SRRTTF station SR4
Division St.	New station
Spokane USGS Gage	Existing SRRTTF station SR3
Between Spokane USGS Gage and Nine Mile Dam	New station
Nine Mile Dam	Existing SRRTTF station SR1

Samples from external loading souces to the river will be colected from Inland Empire Paper, the Spokane County Regional Water Reclamation Facility, and the City of Spokane's Riverside Park Water Reclamation Facility. These external sources will be sampled on the first, third, and fifth days of the synoptic event.

Samples will be shipped overnight to SGS AXYS (for analysis of PCBs) and to SVL laboratories (for analysis of total orgnic carbon, dissolved orgnic carbon, and total suspended solids). Laboratory results will be blank-censored and validated in accordance with the project QAPP.

Task 5. Mass balance assessment

Mass balance assessments will be performed the following river segments:

- Plantes Ferry to Above Upriver Dam
- Above Upriver Dam to Below Upriver Dam

- Below Upriver Dam to Greene St.
- Green St. to Division St.
- Division St. to Spokane USGS Gage
- Spokane USGS Gage to midway to Nine Mile Dam
- Midway to Nine Mile Dam to Nine Mile Dam

The mass balance assessments will compare the observed PCB load at the downstream end of each river segment (calculated as observed river flow times observed concentration) to the known cumulative PCB load entering each segment (calculated as the sum of observed upstream load plus any observed external load). Any occurrence where the observed PCB load at the downstream end of the segment is greater than the known cumulative PCB load entering the segment will be attributed to an unknown loading source.

Separate mass balances will be conducted for total PCBs, individual homologs and PCB-11.

Task 6: Artesian well sampling

Gravity Consultants will collect grab samples in accordance with the Standard Operating Procedures listed in LimnoTech (2014). One sample and a field replicate will be collected from the discharge, for a total of two samples. Samples will be placed on ice and shipped for overnight delivery to SGS AXYS. SGS AXYS will analyze the samples using EPA Method 1668C. Laboratory results will be blank-censored and validated in accordance with the project QAPP.

Task 7: Catch Basin Sampling

The scope of work consists of collection and analysis of PCB concentrations in three to five catch basins located in the areas identified by the PCB detection dog. Specific locations will be selected in consultation with the City of Spokane. Sampling will be performed by Gravity Consultants under the oversight of staff from the City of Spokane. Gravity will collect sediment samples in accordance with the operating procedures developed collaboartively by the City of Spokane and Ecology's Urban Waters Initiative as described in City of Spokane (2014). Four sediment samples will be collected from random locations in each catch basin and mixed thoroughly using a stainless steel spoon and bowl. Samples will be transferred to a laboratory-provided jar and placed in ice and shipped for overnight delivery to SGS AXYS. Laboratory results will be blank-censored and validated in accordance with the project QAPP.

Observed PCB concentrations in each catch basin will be compared to historical catch basin PCB concentrations observed in Spokane. Sources for this historical comparison will at a minimum include:

- Ecology's (2012) "Spokane River Urban Waters Source Investigation and Data Analysis Progress Report (2009-2011)"
- City of Spokane's (2014) "Adaptive Management Plan for Reducing PCBs in Stormwater Discharges: 2014 Annual Report"
- any additional sampling data available from the City of Spokane.

LimnoTech will conduct basic statistical analyses to determine whether the recent samples from the Springfield basin are significantly greater than those measured in other catch basins.

Task 8: Reporting

LimnoTech will prepare a project report documenting the conduct and results of all three study components. The report will present total PCB and homolog concentrations for all samples collected, with full congener results provided electronically as an appendix to the report. The report will document all aspects (i.e., inputs, assumptions, and results) of the mass balance assessments and will provide recommendations for next steps in stormwater sampling in the Springfield basin should catch basin PCB concentrations from this study be significantly higher than from other basins.

Task 9: Data uploading

Individual congener results and all relevant sampling information (e.g., locations, sampling and analytical procedures) will be appropriately formatted and uploaded to Ecology's Environmental Information Management (EIM) database.

Deliverables and Schedule

The expected deliverables and schedule for delivery are provided in Table 2.

Table 2. Deliverables and Schedule

Deliverable	**Completion Date**
Draft QAPP	June 3, 2022
Final QAPP	July 29, 2022
Sample collection	August 31, 2022
Laboratory results	October 31, 2022
Draft technical report	December 16, 2022
Final technical report	January 21, 2023
Data loaded to Ecology's EIM	February 28, 2023

Budget

The total cost for conducting this work is $185,000, noting that $75,000 has already been authorized by the Task Force for conducting an assessment for the USGS gage to Nine Mile segment. Itemized costs are provided in Table 3.

Table 3. Itemized Budget

Item	**Budget**
Scopes of Work	$6000
Draft QAPP	$4000
Final QAPP	$4000
Field planning and coordination	$10,000
Field labor	$48,000
Laboratory analyses	$73,000
Data validation	$10,000
Mass balance assessment	$12,000
Reporting	$10,000
Data uploading	$8,000
Total	**$185,000**