Scope of Work for Additional Groundwater Flow Direction Evaluations Mission Reach – Spokane River

December 19, 2022 Draft

Background

The purpose of the Spokane River Regional Toxics Task Force is to identify and remove sources of PCBs to the Spokane River. Localized areas of high PCB concentrations in the biofilm and sediments of the Mission Reach of the Spokane River have been identified (Era-Miller and Wong, 2022), although the source of this contamination is unknown.

Recent work supported by the Task Force has identified several known or suspected upland sources of PCBs near the Mission Reach (LimnoTech, 2022). Uncertainty exists however, about the potential for transport between these potential upland sources and the Mission Reach. This portion of the river is characterized as a losing reach, meaning that there is a net loss of water from the river to groundwater. If groundwater in this section moves uniformly away from the river, that would eliminate upland subsurface contamination as a source of the observed Mission Reach contamination, because there would be no mechanisms for transporting groundwater contamination to the river. While the section of river containing the Mission Reach is characterized as losing, that characterization applies to average conditions over time and space. If portions of that section of the river were gaining during certain times, however, that would provide a potential transport mechanism for delivering contaminated groundwater to the river (LimnoTech, 2020).

The available data are insufficient to define a hydraulic linkage between contamination from identified upland sites and groundwater delivery to the Mission Reach. A better understanding of this linkage would identify which (if any) of the upland PCB sources are contributing contaminated groundwater to the observed Mission Reach PCB concentration.

Purpose

The purpose of this authorization is to support development of a conceptual site model (CSM) of groundwater flow direction near the Mission Reach. This model will leverage elevation data from existing monitoring wells to define (to the extent possible) the direction of groundwater flow in upland areas near the Mission Reach and provide a better understanding of the hydraulic linkage between identified historical PCB sites and observed contamination in the Spokane River.

Tasks and Deliverables

The scope of work consists of four tasks: 1) Identify additional existing monitoring well locations and associated reports, 2) Construct inventory and interactive map, 3) Construct a working Mission Reach conceptual site model, and 4) Reporting.

Task 1. Identify Additional Existing Monitoring Well Locations and Associated Reports

In July 2022, LimnoTech conducted a well search using available Ecology online data sources to determine the existence of groundwater monitoring wells in the vicinity of the GE NPL site. For this task, LimnoTech will expand that well search westward and southward to include portions of Mission Reach that were not included in the initial search (conducted on the south bank only). Available associated reports and documents and online historical groundwater level data will be downloaded as part of this task. The spatial domain of the well search will be consistent with that covered by the historical source assessment, i.e., a longitudinal extent from approximately ¼ mile upstream of E. Mission Avenue bridge downstream to the Division St. bridge and a lateral extent of ¼ mile north of the river and ½ mile south of the river.

Task 2. Construct Inventory and Interactive Map

Under this task, LimnoTech will construct an inventory and interactive ArcGIS online map of available boring log, well construction, survey data and groundwater monitoring data for wells Identified in Task 1. The Ecology well database generally does not provide location-specific survey data for monitoring wells listed in their online databases; instead, the wells have coordinates that are relative to the site address only. Available site reports will be reviewed to determine if more detailed surveyed well data are available for the wells identified in Task 1 and those identified from the preliminary July 2022 search that also fall within Mission Reach. In addition, geologic information from boring logs and well construction information will be located and compiled if available.

Surveyed well location coordinates, surveyed reference elevations for groundwater monitoring (e.g., top of casing elevation) and well construction data are critical pieces of information for understanding the hydrogeology and groundwater flow field within Mission Reach. The success of this study will depend on our ability to obtain this information from a sufficient number of existing wells to inform the Conceptual Site Model (CSM) for the area of interest (see Task 3 below).

An Excel database will be constructed to document the information that is found for each well, including all survey data, well construction, and historical groundwater level data. This inventory will be used to expand LimnoTech's working interactive ArcGIS Online well database that was developed from the preliminary July well search.

LimnoTech will make a determination at the conclusion of Task 2 regarding whether the available information is sufficiently robust to support development of a conceptual site model. If critical survey and well construction data are lacking, LimnoTech will propose additional steps designed to assist with acquiring that information, including conducting a survey for specific wells that are missing location and elevation data and that may be accessible. In addition, Ecology may be able to assist with acquiring relevant reports directly from property owners where publicly available information is lacking.

Task 3: Construct Working Mission Reach Conceptual Site Model

If sufficient information is obtained from the Task 1 and 2 activities, these data will be used to construct a Conceptual Site Model (CSM) that will identify the following:

- Hydrostratigraphic units and other significant aquifer features within Mission Reach
- Horizontal groundwater flow directions and gradients

- Vertical groundwater flow direction and gradients from available clustered well locations
- Locations of known or suspected upland sources of PCBs near Mission Reach relative to groundwater flow direction
- Data gaps and areas that may require additional investigations and/or input to confirm initial evaluations

Task 4. Report of Findings

If the determination from Task 2 is that the available data are insufficient to develop a conceptual model, the reporting task will consist of a brief technical memorandum documenting means for addressing data gaps.

If Task 3 is conducted, the primary deliverable for this project will be a map of Mission Reach which shows the following information:

- Delineation of relevant aquifer/hydrostratigraphic boundaries
- Locations and identification of wells used in the evaluation
- Locations of relevant known or suspected sources of PCBs
- Arrows showing the predominant direction(s) of horizontal groundwater flow within the Reach

This information as well as additional well-specific information also would be available in the excel database and in the input files for the interactive ArcGIS Online well database.

Schedule and Budget

The tasks described above can be initiated immediately pending Task Force approval. The project schedule for Tasks 1 and 2 is provided in the table below. Tasks 3 and 4 would be completed by June 30, 2023.

Task	Completion Date
 Identify Additional Potential Existing Monitoring Well Locations and Associated Reports 	February 15, 2023
2. Construct Inventory and Interactive Map	March 15, 2023

The costs for Tasks 1 and 2 are provided in the table below, totaling \$23,100. Costs for Tasks 3 and 4 will depend on the results of Task 2 and could range from \$5,000 to \$31,500. These would need to be provided under a separate authorization.

Task	Budget
 Identify Additional Potential Existing Monitoring Well Locations and Associated Repo 	\$9,300
2. Construct Inventory and Interactive Map	\$13,800
Total	\$23,100

References

Era-Miller, B. and S. Wong, 2022. Spokane River PCBs in Biofilm, Sediment, and Invertebrates, 2018 and 2019, Screening Study Results. Environmental Assessment Program, Washington State

Department of Ecology. March 2022. Publication 22-03-002. https://apps.ecology.wa.gov/publications/documents/2203002.pdf

- LimnoTech, 2022. Spokane River Historical PCB Source Review. Prepared for the Spokane Regional Toxics Task Force. November 30, 2022.
- LimnoTech, 2020. Follow-up Investigations from Spokane River Multi-media Data Collection. Prepared for the Spokane Regional Toxics Task Force. August 18, 2020.