Initial Historical Review Memo
Mission Reach Source Assessment Report Rough Evaluation of PCBs in the Spokane River via SPMDs
Scopes and Budgets for Priority Projects

Spokane River Toxics Task Force
April 27, 2022 Meeting

Initial Historical Review
Background

- Review of historical land uses is desired as one means to identify potential PCB sources
  - Detailed review is planned for later this year
- Prior to embarking on detailed review, look at three documents
  - 1993-94 Investigation of PCBs in the Spokane River
  - Spokane River PCB and Source Survey, August 2000
  - Spokane River PCB Source Assessment, 2003-2007

Initial Historical Review
Findings

- Elevated PCB concentrations were found along riverbank near former Inland Metals site
- Elevated PCB concentrations were found in the oxidation ditch of Spokane Industrial Park's WWTP
  - The WWTP facility has since been removed and the site remediated
  - Indicates presence of PCB use in the Spokane Industrial Park
- Mass balance analysis conducted on 2003-2007 data suggests potential presence of unknown loads entering the river

Initial Historical Review

Comments/Responses

- Add summary of Conclusions/Next Steps
  - Done
- Add caveat that the data reviewed are old and predate cleanup actions
  - Done
- Remove text on Pentzer WWTP because site has been remediated
  - Text edited to make two points clearer
    1. "Site has since been remediated via Ecology's Voluntary Cleanup Program in accordance with Model Toxics Control Act requirements and has been designated as requiring No Further Action"
    2. Our interest is in those industries served by the WWTP. Sludge data indicate presence of historical PCB use by WWTP users, and potential for groundwater contamination from them

Initial Historical Review
Comments/Responses

- Provide information on Aroclor distribution at Industrial Park
  - Moved from footnote to body of text
- Remove Ecology (2011) loading pyramid, because:

  1) the data are highly variable

  2) the original report did not claim the presence of unknown loads,

  3) data evaluated were collected prior to cleanup actions and have been superseded with more recent and accurate data

  - Added text noting variability of data
  - Added text that the "unknown load" determination came after original report
  - Recommended repeating the analysis using recent SPMD data

Mission Reach Source Assessment
Background

- PCB concentrations in Mission Reach are higher than elsewhere in the river
  - Suggests presence of unidentified source
- Diagnostic monitoring conducted in 2021 to aid in source identification
  - Water and sediment monitoring
  - PCB-detection dog
  - Sub-bottom object detection
  - Drive-point piezometer feasibility assessment

Mission Reach Source Assessment
Findings

- Water column monitoring did not indicate presence of new PCB source
- “Artesian well” sample suggests presence of contamination (2100 pg/l)
  - Additional monitoring planned
- Object detection survey identified numerous buried metallic objects
  - Follow-up survey approved to extend study area below Trent Avenue
- Sediment sampling confirms presence of patchy contamination
  - Additional monitoring recommended after follow-up object detection survey
- PCB-detection dog identified areas of potential contamination
  - Catch basin monitoring recommended

Mission Reach Source Assessment Comments/Responses

- Fix typographical errors on reported units
  - Done
- Add cosine similarity calculation between the artesian well homologs and Aroclor 1242 and Aroclor 1016
  - Done
- Elevated sediment sample
  - Mention likely presence of Aroclor 1268
    - Done
  - Note that concentration is more than double any recent measurements
    - Done

Mission Reach Source Assessment
Comments To Be Incorporated in Future Studies

- Compare changes in upstream/downstream homolog distributions
  - Will be done under upcoming mass balance assessment
- Examine groundwater monitoring well elevation to assess potential for groundwater flow into Mission Reach
  - Will be done under upcoming groundwater “deeper dive”

2020-2021 Evaluation of PCBs in the Spokane River via Semi Permeable Membrane Devices (SPMDs)

Final Approval

- Draft report provided for approval at January Task Force Meeting
- IEP provided suggested edits
- Ecology disagreed with some of the new language
- Document now edited to both parties' satisfaction

Rough Scopes and Budgets for Priority Projects

- Data synthesis workshop identified several projects for consideration
- Staged plan for approval
  1. Develop scopes and rough budgets for interim approval by TTWG and Task Force
     - Needed in short term to incorporate funding in the Ecology contract
  2. Develop scopes and final budgets for the projects receiving interim approval
     - Subsequent review by TTWG and Task Force prior to final approval

Rough Scopes and Budgets for Priority Projects

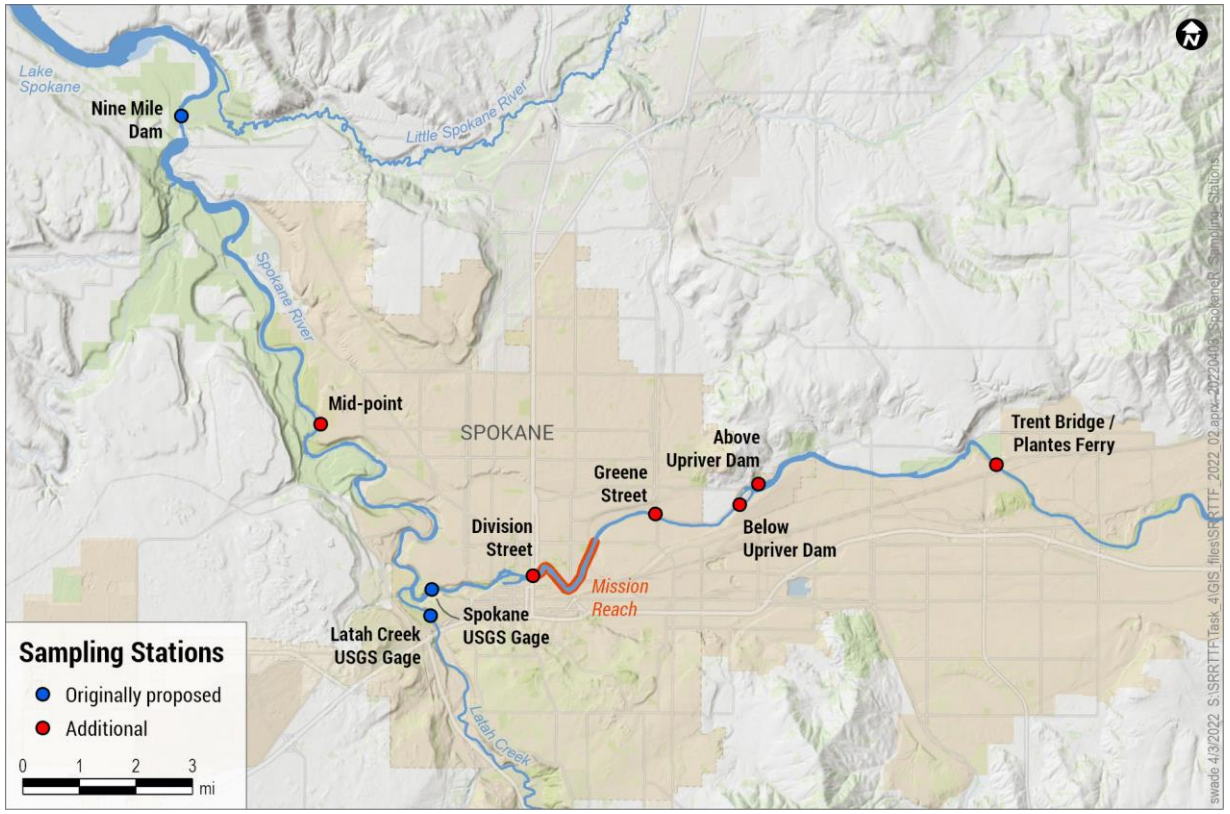
- Priority projects
  - Expanded synoptic survey
  - Springfield stormwater catch basin sampling
  - Artesian well sampling
  - Next level historical review
  - Mission Reach sediment/biofilm sampling
  - Additional sampling at Mirabeau
  - Expanded object detection survey

Expanded Synoptic Survey

- Background/Purpose
  - Task Force has already approved synoptic survey from USGS gage to Nine Mile Dam to perform mass balance assessment on total PCBs, individual homologs, and PCB-11
  - Much information could be gained by expanding spatial scope
    - Better detail on where loads enter downstream of USGS gage
    - Loading assessment for Mission Reach
    - Understanding of homolog shift downstream of Plantes Ferry
- Scope
  - Expand number of river stations
  - Conduct mass balance assessments on all seven reaches
  - Assess specific fate processes downstream of Plantes Ferry

Expanded Synoptic Survey

- Purpose of additional stations
  - Mid point between USGS Gage and Nine Mile Dam
    - Better detail on where loads enter
  - Green Street and Division Street
    - Loading assessment for Mission Reach
  - Plantes Ferry, Above and Below Upriver Dam
    - Understanding of homolog shift downstream of Plantes Ferry



Expanded Synoptic Survey

- Schedule
  - Survey late summer, 2022
  - Completion winter 2023

Deliverable	Completion Date
Draft QAPP	May 18, 2022
Final QAPP	July 22, 2022
Samples 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

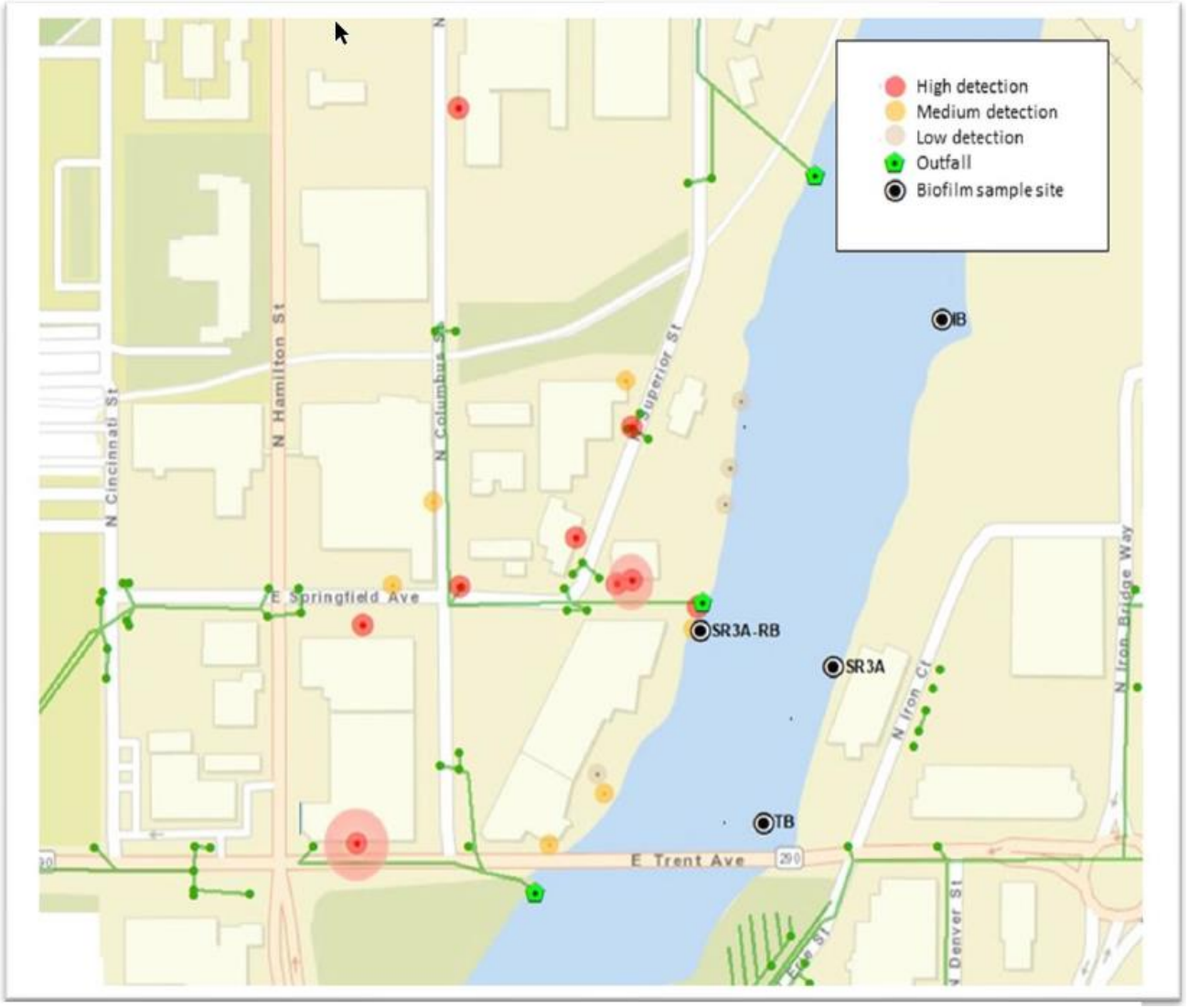
- Budget
  - $80,000 beyond original authorization of $80,000

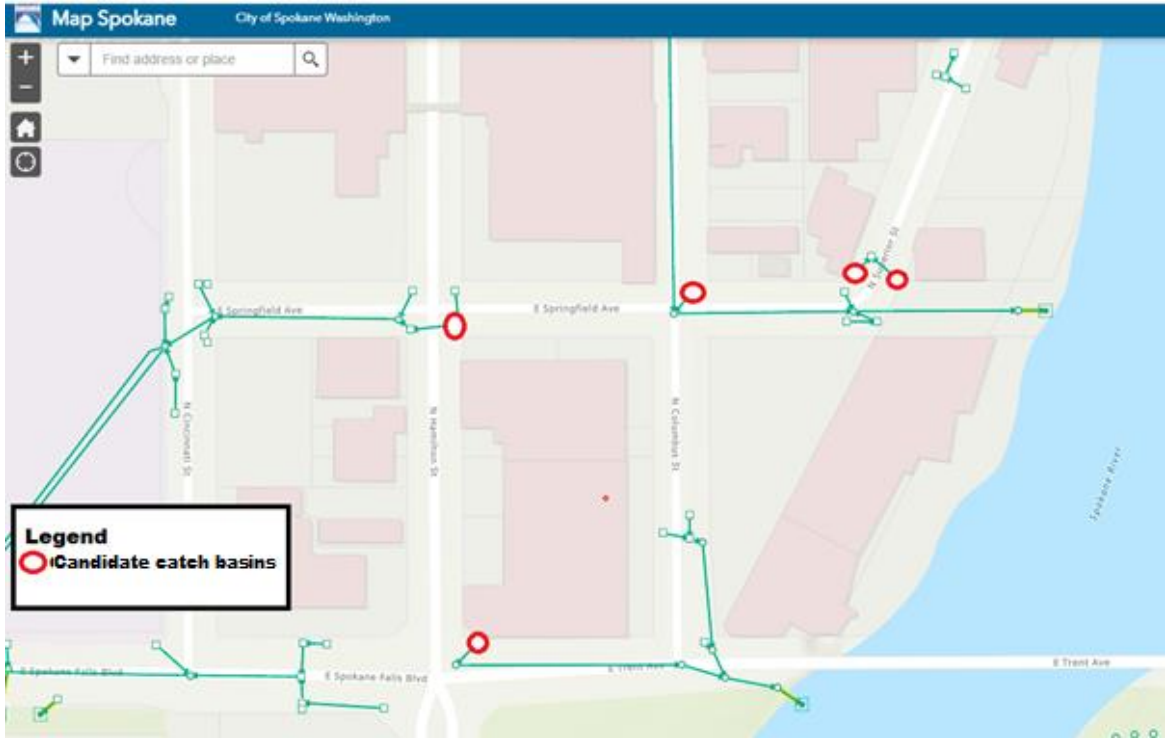
Item	Budget
Scopes of Work	$4000
Draft QAPP	$3000
Final QAPP	$3000
Field planning and coordination	$8000
Field labor	$45,000
Laboratory analyses	$65,000
Data validation	$8000
Mass balance assessment	$12,000
Reporting	$8000
Data uploading	$6000
Total	**$160,000**
Existing Authorization	**$80,000**
Net Budget Request	**$80,000**

Springfield Stormwater Catch Basin Sampling

- Background/Purpose
  - PCB detection dog identified several areas of interest in Springfield stormwater basin
  - Intent of sampling is to gain quantitative confirmation of PCB presence
- Scope
  - Sample PCB content in solids at 3 to 5 catch basins near observed contamination
  - Compare observed PCB concentrations to those previously observed in other catch basins
- Conduct more targeted sampling in future if Springfield PCBs concentrations are greater than those found in typical catch basin

Candidate Catch Basins Relative to PCB Dog Detections





Springfield Stormwater Catch Basin Sampling

- Schedule
  - Survey late summer, 2022
  - Completion winter 2023

Deliverable	Completion Date
Draft QAPP	May 18, 2022
Final QAPP	July 22, 2022
Samples collected	August 31, 2022
Laboratory Results	October 31, 2022
Draft technical memorandum	December 16, 2022
Final technical memorandum	January 21, 2023
Data loaded to Ecology's EIM	February 28, 2023

- Budget
  - $23,850 if done as a stand-alone effort
  - Significantly less if performed in conjunction with other sampling

Item	Budget
Scopes of Work	$4000
Draft QAPP	$2000
Final QAPP	$2000
Field labor	$1850
Mobilization & demobilization	$2500
Laboratory analyses	$6000
Data validation	$1500
Reporting	$2000
Data uploading	$2000
Total	**$23,850**

Artesian Well Sampling

- Background/Purpose
  - Ecology temperature float identified continuous inflow to Mission Reach
    - Initially called artesian well, more likely subsurface drainage
  - Single sample collected in 2021 showed PCB concentrations roughly 10x those seen in the river
- Scope
  - Collect two more samples to confirm elevated concentration
  - Compare homolog distribution to common Aroclors

Artesian Well Sampling

- Schedule
  - Survey late summer, 2022
  - Completion winter 2023

Deliverable	Completion Date
Draft QAPP	May 18, 2022
Final QAPP	July 22, 2022
Samples collected	August 31, 2022
Laboratory Results	October 31, 2022
Draft technical memorandum	December 16, 2022
Final technical memorandum	January 21, 2023
Data loaded to Ecology's EIM	February 28, 2023

- Budget
  - $15,650 if done as a stand-alone effort
  - Significantly less if performed in conjunction with other sampling

Item	Budget
Draft QAPP	$2000
Final QAPP	$2000
Field labor	$1850
Mobilization & demobilization	$2500
Laboratory analyses	$2000
Data validation	$1500
Reporting	$2000
Data uploading	$1800
Total	**$15,650**

Historical Review

- Background/Purpose
  - Majority of PCBs in the river have been traced to legacy contamination
  - Review of historical land uses is a means to identify potential PCB sources
- Scope
  - Review up to 160 Sanborn fire insurance maps from 1952 to 1980 and identify features that were potential sources of PCB releases
  - Review relevant historical documents and associated monitoring data
  - Prioritize sites regarding their potential of being an ongoing PCB source

Historical Review

- Schedule
  - Completion fall, 2022

Deliverable	Completion Date
Technical memorandum documenting Sanborn review	August 26, 2022
Technical memorandum documenting historical report review	August 26, 2022
Technical memorandum prioritizing site and recommending next steps	September 30, 2022

- Budget
  - $57,000
    - Includes purchase of additional Sanborn maps

Item	Budget
Develop Scopes of Work	$4000
Purchase of additional Sanborn maps	$5000
Sanborn map review	$31,000
Review of identified reports	$5000
Review of relevant groundwater monitoring data	$5000
Assessment/prioritization of identified sites	$4000
Reporting	$3000
Total	**$57,000**

Historical Review

- Need for additional maps
  - Roughly 40 maps for complete coverage
  - Maps for 1960 and 1970 only cover portion of City

Year	Map Count
1910	41
1950	40
1952	40
1955	22
1957	18
1959	18
1960	18
1968	18
1969	18
1970	18
1980	39
1965	17
1902	24
1891	2

Mission Reach Sediment/Biofilm Sampling

- Background/Purpose
  - PCBs in Mission Reach bed sediments/ biofilm and are of interest because:
    - they can help identify the location where previously unidentified sources of PCBs
    - they represent PCB exposure to the base of the benthic food chain and can be informative in terms of describing bioaccumulation of PCBs in fish
- Scope
  - Collect up to 150 bed sediments/biofilm PCB samples
    - Direct vicinity of all metallic objects identified during object detection survey
    - Targeted high spatial resolution sampling near areas of historical hot spots
  - Interpret data regarding
    - Location of PCB sources to the Mission Reach
    - Overall sediment characteristics related to bioaccumulation

Mission Reach Sediment/Biofilm Sampling

- Schedule
  - Completion winter, 2023

Deliverable	Completion Date
Draft QAPP	May 18, 2022
Final QAPP	July 22, 2022
Samples collected	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
  - Up to $150,000

Item	Budget	
	10 samples	**50 samples**
Scopes of Work	$4000	$5000
Draft QAPP	$3000	$3000
Final QAPP	$3000	$3000
Field labor and coordination	$16,000	$40,000
Laboratory analyses	$12,000	$60,000
Data validation	$3000	$9,000
Reporting	$6000	$12,000
Data uploading	$4000	$8,000
Project management	$5000	$10,000
Total	**$56,000**	**$150,000**

Mirabeau Park SPMD Sampling

- Background/Purpose
  - Grab samples at Mirabeau Park shown infrequent PCB high concentrations
    - If real, they would indicate a groundwater PCB source entering the river above Kaiser
  - SPMDs with month-long exposure can identify is sporadic spikes are occuring
- Scope
  - Deploy two SPMDs near Mira
    - Direct vicinity of all metallic objects identified during object detection survey
    - Targeted high spatial resolution sampling near areas of historical hot spots
  - Interpret data regarding
    - Location of PCB sources to the Mission Reach
    - Overall sediment characteristics related to bioaccumulation

Mirabeau Park SPMD Sampling

- Schedule
  - Completion winter, 2023

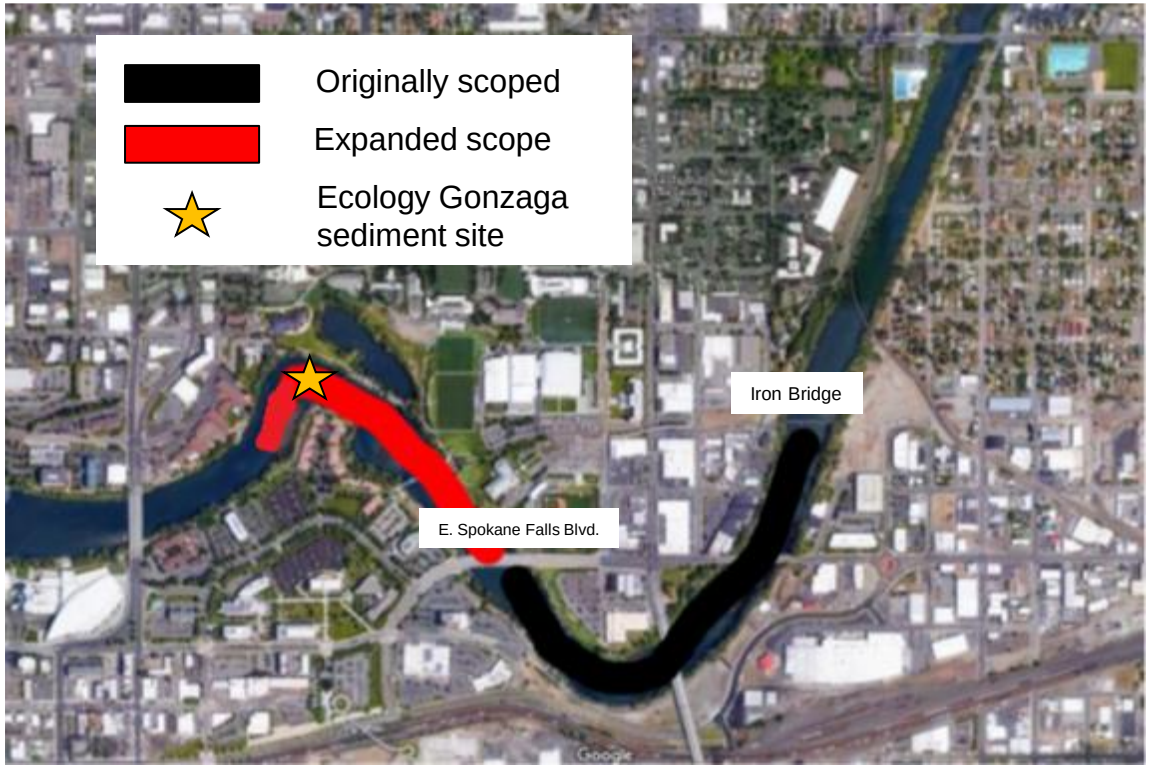
Deliverable	Completion Date
Draft QAPP	May 18, 2022
Final QAPP	July 22, 2022
Samples collection	September 30, 2022
Laboratory results	November 30 2022
Draft technical report	January 16, 2023
Final technical report	February 28, 2023

- Budget
  - $55,000

Item	Budget
Scope of Work	$4000
Draft QAPP	$1000
Final QAPP	$1000
Field planning and coordination	$2000
Field labor	$15,000
Laboratory analyses	$22,000
Data validation	$3000
SPMD Data Processing	$4000
Reporting	$3000
Total	**$55,000**

Expanded Object Detection Survey

- Task Force has already authorized $10,000 for Gravity to complete portion of object detection survey that was inaccessible last fall
  - Original downstream extent of object detection survey was E. Spokane Falls Blvd.
    - Does not extend downstream far enough to capture Gonzaga site where Ecology had found elevated PCBs in 2018
  - Requesting $2,047 additional authorization to extend downstream to Gonzaga site



Summary of Proposed Studies

Study	Cost
Expanded synoptic survey	$80,000
Springfield stormwater catch basin sampling	$23,850
Artesian well sampling	$15,650
Historical review	$57,000
Mission Reach sediment/biofilm sampling	$150,000
Mirabeau Park SPMD sampling	$55,000
Extended object detection survey	$2,047
Total	**$383,547**

- Still to be scoped
  - Adding grab samples to SPMD trend assessment monitoring
  - Deeper dive into Mission Reach groundwater