Monitoring to Assist in Defining the Sources of PCB Contamination in the Mission Reach

TTWG Meeting March 16, 2022

Background

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

Water and Sediment Monitoring

- Three separate components, each with different objectives
 - Water column: Define the spatial distribution of PCB concentrations
 - Artesian well discharge: Provide an indication of the potential significance of contaminated groundwater
 - Bed sediments: Supplement the single Mission Reach sediment sample collected in 2018



Water Results: Total PCBs

- Spokane River
 - Concentrations generally range between 150 and 320 pg/l
 - No obvious spatial pattern indicating presence of a PCB source
 - Elevated concentration observed at E. Mission Ave. (574 pg/l)
 - Source (if any) upstream of Mission Reach
- Artesian Well
 - PCB concentration = 2100 pg/l



Water Results: Homolog Distributions

- Spokane River
 - Tetra- most prevalent, followed by tri- and penta-chloro homologs
 - Potentially indicative of a mixture of Aroclor 1242 and 1254
- Artesian Well
 - Dominated by tri and tetra-chloro homologs
 - Very similar to Aroclor 1242





Sediment Results: Total PCBs

- Consistent with historically observed patterns
 - One elevated (300 ug/kg) concentrations
 - Two concentration similar to those seen outside of Mission Reach





Sediment Results: Homolog Distributions

- Elevated sample
 - Penta- most prevalent, followed by hexa- nona- and tetra-
 - Does nona- signal represent an inadvertent source?
- Other samples
 - Penta- most prevalent, followed by tetra- and hexa-





Water and Sediment Survey: Findings and Next Steps

- Artesian well sample suggests presence of groundwater contamination
 - Additional well sampling to confirm elevated concentrations
 - Deeper dive into groundwater hydrology to better understand when/where groundwater enters Mission Reach
- Sediment sampling confirms presence of patchy contamination
 - Additional monitoring to be recommended after follow-up object detection survey
- River samples did not indicate presence of unknown source in Mission Reach

PCB-Detection Dog

- Trained PCB-detecting dog deployed to identify potential areas of PCB contamination in riparian areas of the Mission Reach
 - Location targeted to where the highest PCB concentrations were observed in biofilm



PCB-Detection Dog: Findings and Next Steps

- No definitive sources of PCBs detected along either riverbank
- Detections were observed at:
 - several buildings in the stormwater drainage area
 - stormwater catch basin sites
 - Drywell sites
- Sampling to be recommended at catch basins
 - Follow-up monitoring contingent upon those results



Object Detection Survey

- Remote sensing technologies deployed to identify potential PCB-containing objects in the riverbed
 - Side scan sonar
 - Physical objects
 - Magnetometer
 - Metallic objects

Object Detection Results

- Entire Mission Reach could not be surveyed due to construction at Trent Ave. Bridge
- Areas of contamination identified in lower portion of surveyed area



Survey Area	Geodetic Settings		Survey Equipment				010	410	434	1	Spokane River Regional Toxic Task Force			
	Horizonal Datum	NAD 1983/2011	Side Scar Sonar	Starligh 990	-	100	210	920	630	Feet	Tim	Soriar Eich	Object Detection	
1 - The second area	Vertical Datam	r:T	Magnetometer	Metho Megnetics SeeSpy	_					•	1000	October	14. 2021	
	Coordinate System	WA North 7875 4801	ATK Corectors	NA	7,292 - 46,029		-8.029	.775377	621 - 1,152	3,548 - 4,210				
	Horizontal Units	US Survey Feel	Speed of Sound	VSI CastAway CTD		-6.028	01,300	378 - 111	1,193 - 1,750	4,211 - 5,074	BM Assistor	(Mitan/R)indDisce		
	Ventical Linits	LIS Survey Feet	Survey Date	OCT 14, 2021		-3,302	2.010	-110 - 22	1,761 - 2,348	6,076 - 5,939	Bas Pessaing	//Water	GRAVITY	
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	Horizonial Control	DGPS	Micene and Product or Target	AncGiS 10.4	-	1.307	776	222 620	2.948 - 3.545	7.468 - 9.662	Between by	SHID		

Object Detection Results

• Three metallic objects identified in downstream portion of surveyed area



Survey Area	Geodetic Settings		Survey Equipment		0 25	50	100	150	200	2	Spokan	e River Regi	onal Toxic Task Force
	Horizontal Datum	NAD 1983/2011	Side Scan Sonar	Starfish 990		00	100	100	Feet	V	IVIT	No-L i dM/dT	SSS Targets
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	Coordinate System	WA North FIPS 4601	RTK Corrections	NA	-7,2926,029	92 - 6,029	-//5 3//	621 - 1,152	3,546 - 4,210				
	Horizontal Units	US Survey Feet	Speed of Sound	YSI CastAway CTD		J3 -376111	1,153 - 1,750	4,211 - 5,074		Data Acquistion:	J.Wilson/R.McEliece		
	Vertical Units	US Survey Feet	Survey Date	OCT 14, 2021	-3,3	-3,3022,040 -110 - 22	-110 - 22	1,751 - 2,348	5,075 - 5,939		Data Processing:	Data Processing: J.Wilson	GRAVITY
1 1 1 1 R ALLAND	Vertical Control	NA	Data Collection & Processing Software	HYPACK 2020	-2,0	39 1,308	23 - 221	2,349 - 2,947	5,940 -	7,468	Drafted by:	J.Wilson	
	Horizontal Control	DGPS	Mapping and Product software	ArcGIS 10.4	-1,3	-1,307776	/6 222 - 620	2,948 - 3,545	7,469 -	9,662	Reviewed by:	S.Hinz	

Object Detection: Next Steps

- Extend object detection survey to cover unmonitored portion of the Mission Reach
- Recommend targeted sediment/biofilm sampling on entire Mission Reach after object detection survey is complete

Drive-Point Piezometer Feasibility Assessment

- Groundwater interaction is of concern in the Mission Reach
- Temporary drive-point piezometers are being considered for use in groundwater quality monitoring as part of the dissolved oxygen TMDL
- Feasibility assessment conducted to determine whether they could be used in Mission Reach
 - Can they be installed?
 - Can we measure water quality in the transition zone between river and aquifer?

Piezometer Feasibility Assessment: Findings and Next Steps

- Piezometers were successfully installed at two out of three locations attempted in the Mission Reach
 - Conductivity in the transition zone higher than that measured in the river
- Next steps
 - No further action planned until ongoing studies assessing groundwater interaction in Mission Reach are completed