

Toxics Monitoring Plan for the Spokane River during Fiscal Year 2013 (FY13)

Department of Ecology – Environmental Assessment Program – Toxics Studies Unit

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Overview of FY13 Monitoring:

Toxics monitoring in the Spokane River during FY13 will include a comprehensive survey of toxics in fish tissue and some preliminary sampling of toxics in water and sediment. The fish tissue monitoring will be included as part of the Washington State Toxics Monitoring Program (WSTMP) – Long Term Trends effort. The WSTMP will be paying for and leading the sampling effort with the goal of developing a baseline program for detecting long-term trends for toxics in fish in the Spokane River. Preliminary sampling of toxics in water and sediment will support the larger long-term monitoring effort for toxics in the Spokane River. Preliminary monitoring will test different sample collection methods and analytical reporting limits for the various environmental matrices.

Ecology will be developing a Quality Assurance Project Plan (QAPP) for the FY13 monitoring for review by the Spokane River Regional Toxics Taskforce prior to sampling. The draft QAPP will be ready by September 7th (the draft was originally slated for August 24th, but more time is needed). Comments from the SRRTTF are requested by September 21st.

Fish Tissue

Four reaches of the Spokane River will be sampled for bottom fish (suckers) and for sport fish species. Specific River reaches and numbers of samples are shown in the Table 1. This sampling regime meets the needs for determining long-term trends for toxics in fish and provides an adequate data set to the State Department of Health (DOH) to evaluate risk to humans from fish consumption and for DOH to update the current fish tissue advisories for the Spokane River if needed.

Table 1. Fish Monitoring Locations and Number of Samples.

River Reach	River Mile	Bottom Fish	Sport Fish	
		Suckers	Mountain Whitefish	Species 2*
		Number of Composite [†] Samples		
Upriver	81 – 86	7	7	0
Mission Park	75 – 77	7	7	3
Ninemile	60 – 64	7	7	3
Upper Long Lake	52 – 56	7	7	3

*Additional sport fish species include smallmouth bass, rainbow trout, and brown trout.

[†] Composite samples consist of 3-5 individual fish per composite.

Fish are slated to be collected during a 3-week period from this September 17th to October 5th. Suckers will be analyzed as whole body and sport fish as skin-on fillets. All samples will be composites consisting of 3-5 fish. All fish will be analyzed for PCB aroclors and PBDEs. Subsets of the samples

will be analyzed for metals (arsenic, cadmium, lead, mercury, and zinc), PCB congeners, and dioxins/furans. The number of samples to be analyzed for PCB congeners may be higher if the contract laboratories can give a break in cost. All samples will be archived for additional future analysis if funds become available.

Water

Whole water samples and CLAM (continuous low-level aqueous monitor) samplers will be used.

Whole water samples will be collected at 3 locations: Plante Ferry, above Latah Creek, and at Ninemile Dam to evaluate whether desired detection limits can be met with whole water sampling. Sampling will occur in mid-October of 2012 and again in spring of 2013, covering two different flow periods.

Plante Ferry and the above Latah Creek locations are free-flowing and samples will be collected at these locations using the depth-integrated grab samplers. The *Ninemile Dam* monitoring site is where a sediment trap will also be placed. Surface water will be collected here as a simple grab sample. The fall whole water sample from *Ninemile Dam* can then be compared to the particulate concentration found at the site during the fall deployment.

CLAMs are active samplers that filter river water at a known rate. They are deployed in rivers for up to 40 hours (approximate battery life for the pump system). It is anticipated that we will deploy them for 36 hours and be able to pump about 100 liters of water. Toxic chemicals are sequestered on the SPE disks inside the CLAM and then the disks are sent to the laboratory for analysis. Reporting limits can be up to 100 times lower with the CLAM system versus whole water analysis, depending on how much water is filtered.

CLAMs are a fairly new technology and the manufacture is loaning Ecology the equipment for free as long as Ecology shares the data. We only have to purchase the SPE disks (\$100 per sample) and pay for the chemical analysis. CLAMs will be deployed at up to 3 locations in the Spokane River during the fall (October) 2012 whole water sampling and sediment deployment.

CLAM samples will be analyzed for PCB congeners, PBDEs, and dioxins/furans while whole water samples will be analyzed for PCB congeners and PBDEs only. Dioxins/furans are rarely detected in whole water.

Sediment (particulates)

Sediment traps will be deployed at 2 locations (Upriver Dam and Ninemile Dam) in October 2012. The estimated deployment period will be 2 – 3 months, since the fall is a low-flow period and particulate concentrations will be lower than during the spring high-flow period. A sediment trap placed at Ninemile Dam for approximately 6 weeks in spring of 2009 yielded adequate deposition for analysis.

Sediment trap samples will be analyzed for PCB congeners, PBDEs, dioxins/furans, and metals.

Analytical Information:

Table 2 provides some information on the analytical methods to be used for the FY13 sampling. Reporting limits presented in the table are based on Ecology's previous studies and may change during more detailed discussion with the contract laboratories in the coming weeks.

Table 2. Analytical Methods and Reporting Limits.

Parameter	Matrix	Method	Reporting Limits*	Cost per [†] Sample	Lab
PCB Aroclors	Fish	EPA 8082	1-4 ug/Kg (ppb) ww	200	MEL
PCB Congeners	Fish	EPA 1668A	0.05-0.1 ug/kg (ppb) ww	700	Contract
PCB Congeners	Surface Water	EPA 1668A	10 pg/L (ppq)	700	Contract
PCB Congeners	CLAM	EPA 1668A	TBD ^a	800	Contract
PCB Congeners	Particulates	EPA 1668A	20 ng/kg (pptr) dw	700	Contract
PBDEs	Fish	EPA 8270	1-5 ug/kg (ppb) ww	210	MEL
PBDEs	Surface Water	EPA 1614	5 pg/L (ppq)	600	Contract
PBDEs	Particulates	EPA 1614	2-500 ng/Kg (pptr) dw	600	Contract
PBDEs	CLAM	EPA 1614	TBD ^a	700	Contract
Dioxins/furans	Fish	EPA 1613B	0.1-1 ng/kg (pptr) ww	650	Contract
Dioxins/furans	Sediment	EPA 1613B	0.05 ng/kg (pptr) dw	600	Contract
Dioxins/furans	Particulates	EPA 1613B	0.05 ng/kg (pptr) dw	600	Contract
Dioxins/furans	CLAM	EPA 1613B	TBD ^a	700	Contract
Cd, Pb, & Zn	Fish	EPA 200.8	0.1 (5.0 for Zn) mg/kg (ppm) ww	100	MEL
Cd, Pb, & Zn	Surface Water	EPA 200.8	0.1 (5.0 for Zn) ug/L (ppb)	82	MEL
Cd, Pb, & Zn	Particulates	EPA 200.8	0.1 (5.0 for Zn) mg/kg (ppm) dw	90	MEL
Lipids	Fish	EPA 608.5	0.1%	32	MEL
Hardness	Surface Water	EPA 200.7	0.3 mg/L	24	MEL
TSS	Surface Water	SM 5310B	1 mg/L	12	MEL
DOC	Surface Water	SM 5310B	1 mg/L	40	MEL
TOC	Surface Water	EPA 415.1	1 mg/L	37	MEL
TOC	Particulates	PSEP 1986	0.1 %	45	MEL
% Solids	Particulates	PSEP 1986	0.1 %	12	MEL

* Reporting limits vary for PCBs, PBDEs, and dioxin/furans depending on the congener.

[†] Costs include 50% discount for all analyses conducted by Manchester Lab; Add 25% for all contract analysis through Manchester Lab.

^a = reporting limits have yet to be determined, but theoretically, reporting limits can be up to 100 times lower than for those methods analyzing whole surface water samples.

CLAM = Continuous Low-Level Aqueous Monitor

ppm = part per million

ppb = part per billion

pptr = part per trillion

ppq = part per quadrillion

dw = dry weight

ww = wet weight