

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

Updated 9-7-12

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 suspended particulates. 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 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.

The preliminary sampling of toxics in surface water and suspended particulates is not meant to represent comprehensive monitoring. Instead, it is designed to test different sample collection methods and analytical reporting limits for the various environmental matrices. It is our intent that this preliminary data will help Ecology and the Taskforce design more informed sampling plans for monitoring Spokane River surface water in the future.

Ecology is in the process of developing a Quality Assurance Project Plan (QAPP) for the FY13 monitoring. The draft QAPP will be ready for review by late October 2012. Due to recent additions to the budget and scope of the FY13 monitoring, more time is needed to complete the draft QAPP.

Ecology would like to give the Spokane River Regional Toxics Taskforce (SRRTTF) – Technical Work Group (TWG) a chance to comment on the general components of the FY13 toxics monitoring plan as presented in this document. Comments from the SRRTTF on the present document are requested by September 21st and can be sent directly to Brandee Era-Miller.

Fish Tissue

Six 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.

Four reaches were originally slated for sampling (Upriver, Mission Park, Ninemile, and upper Long Lake), but due to funds offered by the Spokane Tribe, 3 additional sampling sites have been added. The additional sites include Stateline, Little Falls Pool, and the Spokane Arm. The number of samples to be analyzed at these additional sites still needs to be determined and depends on both the budget and the specific data needs of Ecology and the Spokane Tribe.

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		
Stateline	96	TBD	--	--
Upriver	81 – 86	7	--	--
Mission Park	75 – 77	7	5	3
Ninemile	60 – 64	7	5	3
Upper Long Lake	52 – 56	7	5	3
Little Falls Pool	29 – 34	TBD	TBD	TBD
Spokane Arm	18 – 29	TBD	TBD	TBD

*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, 2012, 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 (method EPA 8082) and PBDEs (method EPA 8270). Subsets of the samples will be analyzed for metals (arsenic, cadmium, lead, mercury, and zinc), PCB congeners (method EPA 1668A), and dioxins/furans (method EPA 1613B). All samples will be archived for additional future analysis if funds become available.

Surface Water

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 May 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.

Ecology is currently discussing adding 2 more locations for the preliminary whole water sampling: Little Falls Pool and the Spokane Arm at the request of the Spokane Tribe. They will provide the funding for this additional analysis.

Whole water samples will be analyzed for PCB congeners and PBDEs (method EPA 1614) only. Dioxins/furans are rarely detected in whole water and will be analyzed in the CLAM samples.

C.L.A.M. (continuous low-level aqueous monitor)

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

24 – 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 2 locations in the Spokane River during the fall (October) 2012 whole water sampling and sediment trap deployment.

CLAM samples will be analyzed for PCBs (congeners and Aroclors), PBDEs (via EPA method 8270 and method 1614), and dioxins/furans. Many details have yet to be worked out with the laboratories conducting analyses of the CLAM samples. This could change the number of samples and analyses as the labs will need to charge for some minimal research and development with this new analytical matrix.

For 2 of the CLAM samples being analyzed for PCB congeners only, a pre-filter disk will be used along with the regular SPE disk. The pre-filter catches PCBs attached to particulates in the water. This will give an estimate of the amount of PCBs in the dissolved versus particulate phase.

Suspended 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 (method EPA 1614), dioxins/furans, and metals.

Analytical Information:

Table 2 provides 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 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	1-44 ug/Kg (ppb) ww per Aroclor	205	MEL
PCB Aroclors	CLAM	EPA 8082	TBD ^a	190	MEL
PCB Congeners	Fish	EPA 1668A	0.005-0.8 ug/Kg (ppb) ww per congener	856	Contract
PCB Congeners	Surface Water	EPA 1668A	10 pg/L (ppq) per congener	875	Contract
PCB Congeners	CLAM	EPA 1668A	TBD ^a	975	Contract
PCB Congeners	Particulates	EPA 1668A	5 ng/kg (pptr) dw per congener	875	Contract
PBDEs	Fish	EPA 8270	0.1-2.6 (1.9-4.3 for PBDE 209) ug/kg (ppb) ww	210	MEL
PBDEs	CLAM	EPA 8270	TBD ^a	280	MEL
PBDEs - HR	Surface Water	EPA 1614	35-625 pg/L (ppq) per congener w/PBDE 209 higher	875	Contract
PBDEs - HR	Particulates	EPA 1614	5-1,500 ng/kg (pptr) dw per congener	875	Contract
PBDEs - HR	CLAM	EPA 1614	TBD ^a	975	Contract
Dioxins/furans	Fish	EPA 1613B	0.03-0.5 ng/Kg (pptr) ww per congener	750	Contract
Dioxins/furans	Particulates	EPA 1613B	0.5-5 ng/kg (pptr) dw per congener	875	Contract
Dioxins/furans	CLAM	EPA 1613B	TBD ^a	975	Contract
As, Cd, Pb, & Zn	Fish	EPA 200.8	0.1 (5.0 for Zn) mg/kg (ppm) ww	108	MEL
Hg	Fish	EPA 200.8	17 ug/Kg (ppb) ww	50	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
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	40	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; A 25% fee is included 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

HR = high resolution; analytical method for PBDEs (EPA method 1614)

ppm = part per million

ppb = part per billion

pptr = part per trillion

ppq = part per quadrillion

dw = dry weight

ww = wet weight