

Water Body No. WA-55-1010
(Segment No. 24-54-01)

WASHINGTON STATE DEPARTMENT OF ECOLOGY
ENVIRONMENTAL INVESTIGATIONS AND LABORATORY SERVICES PROGRAM
TOXICS INVESTIGATIONS/GROUND WATER MONITORING SECTION

TECHNICAL MEMORANDUM

January 25, 1990

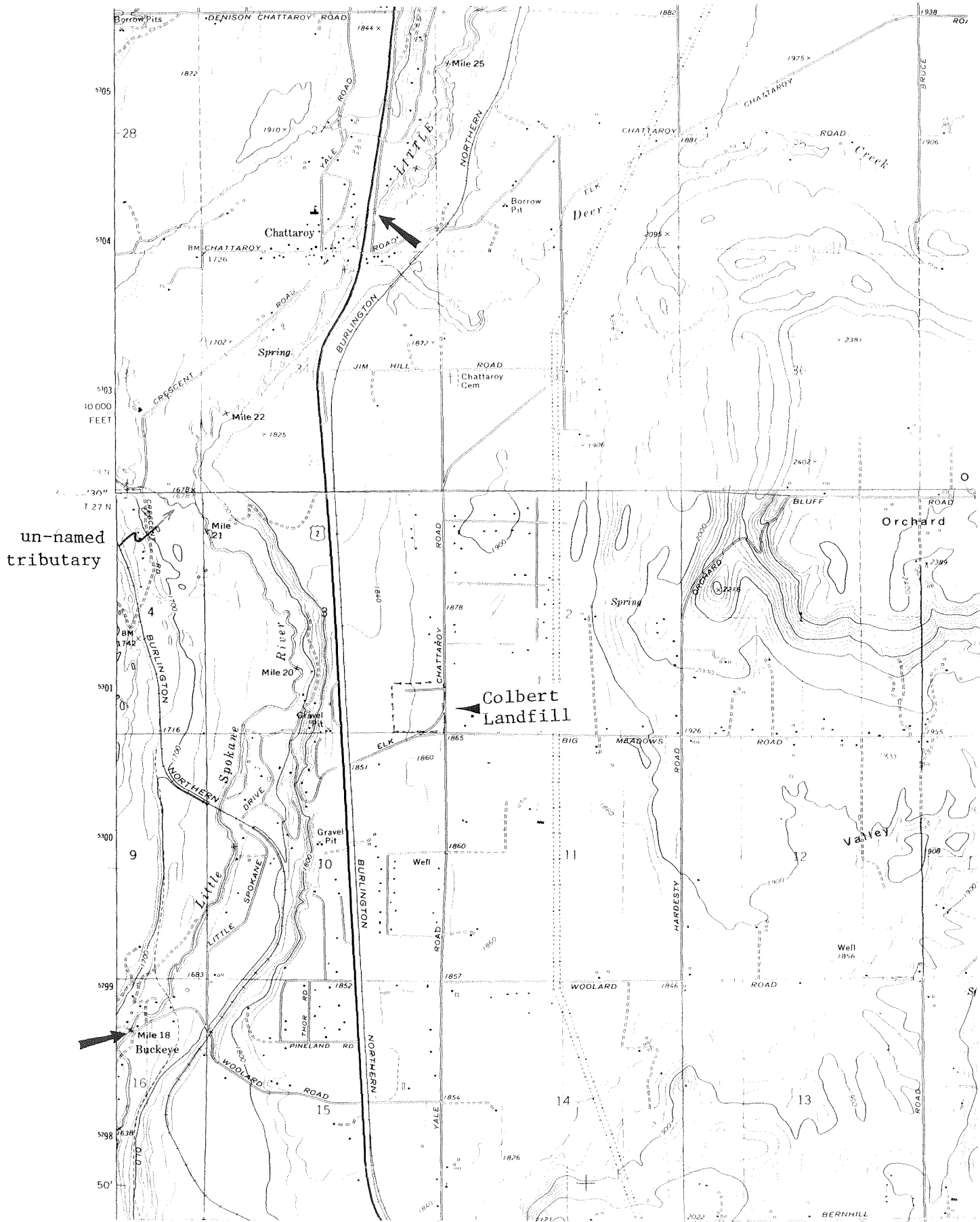
TO: Mike Blum
THROUGH: Bill Yake
FROM: Art Johnson
SUBJECT: Survey for Volatiles in the Little Spokane River

In response to your request, I conducted a brief survey of water quality in the Little Spokane River in the vicinity of the Colbert Landfill on September 12-13, 1989. The primary objective was to determine if the solvent-contaminated ground water plume beneath the landfill had reached the river. A secondary objective was to obtain general water quality data on this reach of the river.

Water samples were collected at Chattaroy just upstream of Highway 2 at the Eastern Washington University streamflow gaging station (river mile 23) and at the Woolard Road bridge (river mile 18). The Woolard bridge is approximately 1.5 miles downstream from Colbert Landfill (see figure).

Three grab samples were collected from center river at both sites over an 18-hour period. Sample containers for analysis of volatiles were standard 40 ml glass vials with teflon septa (I-Chem Series 300, Hayward CA) filled leaving no head space. A transfer blank was prepared in the field at the Woolard site; a transport blank was also carried through the survey. Samples were kept on ice and transported to the Ecology Manchester Laboratory on September 14. Volatiles were analyzed at Manchester by EPA Method 624 within 12 to 13 days of collection. Sampling and analysis methods for other water quality variables followed standard Ecology procedures described in Huntamer and Smith (1989).

River flow during the survey, based on gage heights at Chattaroy, ranged from 77.2 to 80.0 cfs (data provided by Greg Baca, Spokane Community College). Flow in the Little Spokane at the USGS Dartford gage (r.m. 11.4) was 109 cfs during the same period (data provided by Michael Boatsman, Ecology Eastern Regional Office). The 7-day, 10-year low flow for the Little Spokane at Dartford is 92 cfs; the 40-year average is 312 cfs (USGS, 1985).



un-named tributary

Colbert Landfill

SAMPLING STATIONS (→)

Results of analysis for volatiles showed a trace of 1,1,1-trichloroethane, the predominant ground water contaminant at Colbert, was present in all samples collected at Woolard bridge (Table 1). Concentrations were below the quantitation limit of the instrument and were estimated to be 2 ug/L. This concentration represents a load of approximately 0.8 lbs/ day going into the river--assuming complete mixing and ignoring losses through volatilization. There was no evidence of trichloroethane in the Little Spokane upstream of the fill. In the opinion of the analyst, Greg Perez, a conservative estimate of the highest trichloroethane concentration that could have been present in the Chattaroy samples and escape detection is on the order of 0.5 ug/L.

The only other volatile compound detected during the survey was 2 ug/L of methylene chloride in the transport blank. The complete data set for the survey, including recoveries of matrix spikes and surrogates, is attached.

Table 2 summarizes the remaining water quality data. The river was within Class AA - A standards for temperature, dissolved oxygen, pH, and turbidity. Although a number of constituents showed elevated concentrations at Woolard relative to Chattaroy, changes of this magnitude occur in many rivers and cannot, based on these data, be attributed to the Colbert plume. Chloride concentrations at both sampling sites appeared to decrease over the course of the survey; other constituents remained relatively unchanged.

Nitrite/nitrate concentrations were much higher at Woolard than Chattaroy (average of 0.88 vs. 0.18 mg/L). Preliminary results from samples collected on December 12, 1989, (described below) suggest an un-named, right bank (facing downstream) tributary at approximately river mile 21.1 is a major nitrogen source to this reach of the river. This tributary is identified on the accompanying figure.

Two potentially toxic metals were analyzed: cadmium, in light of its detection in the Colbert plume, and mercury because Ecology ambient monitoring data show elevated concentrations at the mouth of the Little Spokane. Neither metal was present in detectable amounts during the present survey.

As you know, detection of trichloroethane in the Little Spokane was the impetus for the above-mentioned December 12 survey, designed to determine where the plume was entering the river. Samples for analysis of volatiles, specific conductance, chloride, and nitrite/nitrate were collected along a ten-station transect between Woolard bridge and Chattaroy. Samples were also collected from Sterling Spring (left bank, west of Colbert Landfill) and the river mile 21.1 tributary. More sensitive analytical methods are being employed on these samples in an effort to better quantify trichloroethane concentrations and detect other volatile compounds of concern. Chemical analyses should be completed by the end of January.

REFERENCES:

Huntamer, D. and C. Smith. 1989. Lab User's Manual. Wash. Dept. Ecology,
Manchester Laboratory.

USGS. 1985. Streamflow Statistics and Drainage Basin Characteristics of
the Southwestern and Western Regions, Washington. Volume II.
Open-file Report 84-145-B.

BY:AJ/sk

Attachments

cc: Carl Neuchterlein
Claude Sappington
Michael Boatsman
Dick Cunningham
Steve Twiss
Steve Hunter

Table 1. 1,1,1-Trichloroethane concentrations in the Little Spokane River above and below Colbert Landfill, September 1989.

Location	Date	Time	Sample No. (37-)	1,1,1-Trichloroethane (ug/L)
Chattaroy above Highway 2 Bridge	Sept 12	1430	8135	5 U
	Sept 12	1815	8133	5 U
	Sept 13	0755	8134	5 U
Woolard Road Bridge	Sept 12	1545	8130	2 J
			8130*	2 J
	Sept 12	1845	8131	2 J
	Sept 13	0830	8132	2 J
Transfer Blank	Sept 12	1615	8136	5 U
Transport Blank	--	--	8137	5 U
Method Blank	--	--	--	5 U

U = not detected; value shown is quantitation limit

J = estimated value

* = duplicate analysis

Table 2. Other water quality data for the Little Spokane River above and below Colbert Landfill, September 1989.

Location:	Chattaroy above Highway 2 Bridge			Woolard Road Bridge		
	Sept 12	Sept 12	Sept 13	Sept 12	Sept 12	Sept 13
Date:	1430	1815	0755	1545	1845	0830
Time:						
Sample No. (37-):	8135	8133	8134	8130	8131	8132
Flow (cfs)	80.0	78.6	77.2	--	--	--
Temperature (°C)	14.6	15.3	12.0	14.4	14.5	10.6
pH (S.U.)	8.3	8.4	7.9	8.3/8.3*	8.2	8.0
Dissolved Oxygen (mg/L)	10.6	10.8	8.0	10.1	9.2	9.2
Spec. Conductivity (umhos/cm)	179	167	185	232/233*	223	233
Total Suspended Solids (mg/L)	1	1 U	2	1/1 U*	1	2
Turbidity (NTU)	1.2	1.6	0.9	1.0/0.9*	1.1	1.3
Total Hardness (mg/L)	98	97	100	129/129*	128	125
Chloride (mg/L)	3.21	1.63	1.56	3.61	2.56	1.94/1.93*
Nitrite/Nitrate (mg/L)	0.18	0.17	0.18	0.88/0.88*	0.87	0.90
Sulfate (mg/L)	4.88	4.76	4.85	6.61	6.60	6.59/6.60*
Silica (mg/L)	16.9/15.9*	16.0	16.5	19.3	19.2	19.0
Total Alkalinity (mg/L)	94	92	94	116/115*	115	115
Calcium (mg/L)	27.4	26.8	26.9	34.6/34.5*	34.2	34.0
Magnesium (mg/L)	5.74	5.67	5.72	7.50/7.48*	7.32	7.27
Sodium (mg/L)	4.77	4.74	4.74	5.72/5.71*	5.58	5.58
Potassium (mg/L)	1.9	1.7	1.8	2.0/2.1*	2.1	2.1
Mercury (ug/L)	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Cadmium (ug/L)	0.20 U	0.20 U	0.20 U	0.20U/0.20U*	0.20 U	0.20 U
Iron (ug/L)	54.9	66.4	67.2	55.6/58.0*	67.2	67.9
Manganese (ug/L)	9.1	9.1	11.1	13.7/13.7*	14.3	16.3

Note: Metals are total recoverable

* = duplicate analysis

U - not detected at detection limit shown

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378130

Description: WOOLARD

Source: Ambient Stream/River

Begin Date: 89/09/12

Gen Inorg/Phys-Speci		Water-Total		Metals - Total Recov		Water-Total		VOA - PP Scan (GCMS)		Water-Total	
		Result	Units	Duplicate #1		Result	Units			Result	Units
Cond@25C	Meter	232 *	umho/cm	Cadmium	Tot-Rec	0.20U	ug/l	Carbon Tetrachloride		5U	ug/l
pH LAB	Meter	8.3 *	Std Units					Acetone		10U	ug/l
Alk-Tot	CaCO3	116 *	mg/l					Chloroform		5U	ug/l
Alk-HCO3	CaCO3	116 *	mg/l					Benzene		5U	ug/l
Alk-CO3	CaCO3	1U	mg/l					1,1,1-Trichloroethane		2J*	ug/l
Hard-Tot	CaCO3	129 *	mg/l					Bromomethane		10U	ug/l
Silica	Total	19.3 *	mg/l					Chloromethane		10U	ug/l
Turbidty	Meter	1.0 *	NTU					Dibromomethane		5U	ug/l
				Calcium	Tot-Rec	34.5 *	mg/l	Bromochloromethane		5U	ug/l
				Mgnsium	Tot-Rec	7.48 *	mg/l	Chloroethane		10U	ug/l
				Sodium	Tot-Rec	5.71 *	mg/l	Vinyl Chloride		10U	ug/l
				Potssium	Tot-Rec	2.1 *	mg/l	Methylene Chloride		5U	ug/l
				Iron	Tot-Rec	58.0 *	ug/l	Carbon Disulfide		5U	ug/l
				Mangnese	Tot-Rec	13.7 *	ug/l	Bromoform		5U	ug/l
								Bromodichloromethane		5U	ug/l
								1,1-Dichloroethane		5U	ug/l
								1,1-Dichloroethene		5U	ug/l
								Trichlorofluoromethane		5U	ug/l
								Methane, Dichlorodiflu+		10U	ug/l
								1,2-Dichloropropane		5U	ug/l
								2-Butanone		10U	ug/l
								1,1,2-Trichloroethane		5U	ug/l
								Trichloroethene		5U	ug/l
								ETHANE, 1,1,2,2-TETRAC+		5U	ug/l
								1,2,3-Trichlorobenzene		5U	ug/l
								Hexachlorobutadiene		5U	ug/l
								Naphthalene		5U	ug/l
								Total Xylenes		5U	ug/l
								2-Chlorotoluene		5U	ug/l
								1,2-Dichlorobenzene		5U	ug/l
								1,2,4-Trimethylbenzene		5U	ug/l
								DBCP		5U	ug/l
								1,2,3-Trichloropropane		5U	ug/l
								Tert-Butylbenzene		5U	ug/l
								Isopropylbenzene (Cumo+		5U	ug/l
								p-Isopropyltoluene		5U	ug/l
								BENZENE, ETHYL-		5U	ug/l
								BENZENE, ETHENYL-		5U	ug/l
								BENZENE, PROPYL-		5U	ug/l
								Butylbenzene		5U	ug/l
								4-Chlorotoluene		5U	ug/l
								1,4-Dichlorobenzene		5U	ug/l
								1,2-Dibromoethane (EDB)		10U	ug/l
								1,2-Dichloroethane		5U	ug/l
								Vinyl Acetate		10U	ug/l

(Continued on next page)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378130

Description: WOOLARD

Source: Ambient Stream/River

Begin Date: 89/09/12 :

VOA - PP Scan (GCMS) *** Continued ***			VOA - PP Scan (GCMS) *** Continued ***			VOA - PP Scan (GCMS) *** Continued ***		
Water-Total		Duplicate #1	Water-Total		Duplicate #1	Water-Total		Duplicate #1
Result	Units		Result	Units	Result	Result	Units	Units
4-Methyl-2-Pentanone	10U ug/l	Trichlorofluoromethane	5U ug/l		Ethane, 1,1,1,2-Tetrac+	5U	ug/l	
1,3,5-Trimethylbenzene	5U ug/l	Methane, Dichlorodifluo	10U ug/l		cis-1,3-Dichloropropene	5U	ug/l	
Bromobenzene	5U ug/l	1,2-Dichloropropane	5U ug/l		trans-1,3-Dichloroprop+	5U	ug/l	
Toluene	5U ug/l	2-Butanone	10U ug/l		Surrog: D4-1,2-Dichlor+	100	% Recov	
Chlorobenzene	5U ug/l	1,1,2-Trichloroethane	5U ug/l		Surrog: 1,4-Bromofluor+	102	% Recov	
1,2,4-Trichlorobenzene	5U ug/l	Trichloroethene	5U ug/l		Surrog: D8 Toluene	103	% Recov	
Dibromochloromethane	5U ug/l	ETHANE, 1,1,2,2-TETRAC+	5U ug/l					
Tetrachloroethene	5U ug/l	1,2,3-Trichlorobenzene	5U ug/l		-----			
Sec-Butylbenzene	5U ug/l	Hexachlorobutadiene	5U ug/l		Ion Chromatography		Water-Total	
1,3-Dichloropropane	5U ug/l	Naphthalene	5U ug/l			Result	Units	
Cis-1,2-Dichloroethene	5U ug/l	Total Xylenes	5U ug/l					
trans-1,2-Dichloroethe+	5U ug/l	2-Chlorotoluene	5U ug/l		-----			
1,3-Dichlorobenzene	5U ug/l	1,2-Dichlorobenzene	5U ug/l		Chloride	3.61	* mg/l	
1,1-Dichloropropene	5U ug/l	1,2,4-Trimethylbenzene	5U ug/l		Sulfate Total	6.61	* mg/l	
2,2-Dichloropropane	5U ug/l	DBCP	5U ug/l					
2-Hexanone	10U ug/l	1,2,3-Trichloropropane	5U ug/l					
Ethane, 1,1,1,2-Tetrac+	5U ug/l	Tert-Butylbenzene	5U ug/l					
cis-1,3-Dichloropropene	5U ug/l	Isopropylbenzene (Cume+	5U ug/l					
trans-1,3-Dichloroprop+	5U ug/l	p-Isopropyltoluene	5U ug/l					
Surrog: D4-1,2-Dichlor+	93 % Recov	BENZENE, ETHYL-	5U ug/l					
Surrog: 1,4-Bromofluor+	100 % Recov	BENZENE, ETHENYL-	5U ug/l					
Surrog: D8-Toluene	101 % Recov	BENZENE, PROPYL-	5U ug/l					
		Butylbenzene	5U ug/l					
		4-Chlorotoluene	5U ug/l					
		1,4-Dichlorobenzene	5U ug/l					
		1,2-Dibromoethane (EDB)	10U ug/l					
		1,2-Dichloroethane	5U ug/l					
		Vinyl Acetate	10U ug/l					
		4-Methyl-2-Pentanone	10U ug/l					
		1,3,5-Trimethylbenzene	5U ug/l					
		Bromobenzene	5U ug/l					
		Toluene	5U ug/l					
		Chlorobenzene	5U ug/l					
		1,2,4-Trichlorobenzene	5U ug/l					
		Dibromochloromethane	5U ug/l					
		Tetrachloroethene	5U ug/l					
		Sec-Butylbenzene	5U ug/l					
		1,3-Dichloropropane	5U ug/l					
		Cis-1,2-Dichloroethene	5U ug/l					
		trans-1,2-Dichloroethe+	5U ug/l					
		1,3-Dichlorobenzene	5U ug/l					
		1,1-Dichloropropene	5U ug/l					
		2,2-Dichloropropane	5U ug/l					
		2-Hexanone	10U ug/l					

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Source: Ambient Stream/River

Sample No: 89 378131

Description: WOOLARD

Begin Date: 89/09/12 :

Gen Inorg/Phys-Speci		Water-Total		VOA - PP Scan (GCMS)		Water-Total		VOA - PP Scan (GCMS)		Water-Total	
		Result	Units			Result	Units	*** Continued ***		Result	Units
Cond@25C	Meter	223	* umho/cm	Carbon Tetrachloride	5U	ug/l		4-Methyl-2-Pentanone	10U	ug/l	
pH LAB	Meter	8.2	* Std Units	Acetone	10U	ug/l		1,3,5-Trimethylbenzene	5U	ug/l	
Alk-Tot	CaCO3	115	* mg/l	Chloroform	5U	ug/l		Bromobenzene	5U	ug/l	
Alk-HCO3	CaCO3	115	* mg/l	Benzene	5U	ug/l		Toluene	5U	ug/l	
Alk-CO3	CaCO3	1U	mg/l	1,1,1-Trichloroethane	2J*	ug/l		Chlorobenzene	5U	ug/l	
Hard Tot	CaCO3	128	* mg/l	Bromomethane	10U	ug/l		1,2,4-Trichlorobenzene	5U	ug/l	
Silica	Total	19.2	* mg/l	Chloromethane	10U	ug/l		Dibromochloromethane	5U	ug/l	
Turbidity	Meter	1.1	* NTU	Dibromomethane	5U	ug/l		Tetrachloroethene	5U	ug/l	
				Bromochloromethane	5U	ug/l		Sec-Butylbenzene	5U	ug/l	
				Chloroethane	10U	ug/l		1,3-Dichloropropane	5U	ug/l	
Solids - Specified		Water-Total		Vinyl Chloride		10U ug/l		Cis-1,2-Dichloroethene		5U ug/l	
		Result	Units	Methylene Chloride		5U ug/l		trans-1,2-Dichloroethene		5U ug/l	
Solids T Suspen		1	* mg/l	Carbon Disulfide		5U ug/l		1,3-Dichlorobenzene		5U ug/l	
				Bromoform		5U ug/l		1,1-Dichloropropene		5U ug/l	
				Bromodichloromethane		5U ug/l		2,2-Dichloropropane		5U ug/l	
				1,1-Dichloroethane		5U ug/l		2-Hexanone		10U ug/l	
Nutrients - Specified		Water-Total		1,1-Dichloroethene		5U ug/l		Ethane, 1,1,1,2-Tetrac		5U ug/l	
		Result	Units	Trichlorofluoromethane		5U ug/l		cis-1,3-Dichloropropene		5U ug/l	
NO2NO3-N Total		0.87	* mg/l	Methane, Dichlorodiflu		10U ug/l		trans-1,3-Dichloroprop		5U ug/l	
				1,2-Dichloropropane		5U ug/l		Surrog: D4-1,2-Dichlor		99 % Recov	
				2-Butanone		10U ug/l		Surrog: 1,4-Bromofluor		98 % Recov	
Metals - Total Recov		Water-Total		1,1,2-Trichloroethane		5U ug/l		Surrog: D8-Toluene		103 % Recov	
		Result	Units	Trichloroethene		5U ug/l					
Cadmium Tot-Rec		0.20U	ug/l	ETHANE, 1,1,2,2-TETRAC		5U ug/l					
Mercury Tot-Rec		.06U	ug/l	1,2,3-Trichlorobenzene		5U ug/l					
				Hexachlorobutadiene		5U ug/l		Ion Chromatography			
				Naphthalene		5U ug/l		Water-Total			
				Total Xylenes		5U ug/l		Result		Units	
Metals - Total Recov		Water-Total		2-Chlorotoluene		5U ug/l		Chloride		2.56 * mg/l	
		Result	Units	1,2-Dichlorobenzene		5U ug/l		Sulfate Total		6.60 * mg/l	
				1,2,4-Trimethylbenzene		5U ug/l					
				DBCP		5U ug/l					
Calcium Tot-Rec		34.2	* mg/l	1,2,3-Trichloropropane		5U ug/l					
Magnesium Tot-Rec		7.32	* mg/l	Tert-Butylbenzene		5U ug/l					
Sodium Tot-Rec		5.58	* mg/l	Isopropylbenzene (Cume		5U ug/l					
Potassium Tot-Rec		2.1	* mg/l	p-Isopropyltoluene		5U ug/l					
Iron Tot-Rec		67.2	* ug/l	BENZENE, ETHYL-		5U ug/l					
Manganese Tot-Rec		14.3	* ug/l	BENZENE, ETHENYL-		5U ug/l					
				BENZENE, PROPYL-		5U ug/l					
				Butylbenzene		5U ug/l					
				4-Chlorotoluene		5U ug/l					
				1,4-Dichlorobenzene		5U ug/l					
				1,2-Dibromoethane (EDB)		10U ug/l					
				1,2-Dichloroethane		5U ug/l					
				Vinyl Acetate		10U ug/l					

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378132

Description: WOOLARD

Source: Ambient Stream/River

Begin Date: 89/09/13 :

Gen Inorg/Phys-Speci		Water-Total		VOA - PP Scan (GCMS)		Water-Total		VOA - PP Scan (GCMS)		Water-Total	
		Result	Units			Result	Units	*** Continued ***		Result	Units
Cond@25C	Meter	233	* umho/cm	Carbon Tetrachloride	5U	ug/l					
pH LAB	Meter	8.0	* Std Units	Acetone	10U	ug/l		4-Methyl-2-Pentanone	10U	ug/l	
Alk-Tot	CaCO3	115	* mg/l	Chloroform	5U	ug/l		1,3,5-Trimethylbenzene	5U	ug/l	
Alk-HCO3	CaCO3	115	* mg/l	Benzene	5U	ug/l		Bromobenzene	5U	ug/l	
Alk-CO3	CaCO3	1U	mg/l	1,1,1-Trichloroethane	2J*	ug/l		Toluene	5U	ug/l	
Hard-Tot	CaCO3	125	* mg/l	Bromomethane	10U	ug/l		Chlorobenzene	5U	ug/l	
Silica	Total	19.0	* mg/l	Chloromethane	10U	ug/l		1,2,4-Trichlorobenzene	5U	ug/l	
Turbidity	Meter	1.3	* NTU	Dibromomethane	5U	ug/l		Dibromochloromethane	5U	ug/l	
				Bromochloromethane	5U	ug/l		Tetrachloroethene	5U	ug/l	
				Chloroethane	10U	ug/l		Sec-Butylbenzene	5U	ug/l	
				Vinyl Chloride	10U	ug/l		1,3-Dichloropropane	5U	ug/l	
				Methylene Chloride	5U	ug/l		Cis-1,2-Dichloroethene	5U	ug/l	
				Carbon Disulfide	5U	ug/l		trans-1,2-Dichloroethene	5U	ug/l	
				Bromoform	5U	ug/l		1,3-Dichlorobenzene	5U	ug/l	
				Bromodichloromethane	5U	ug/l		1,1-Dichloropropene	5U	ug/l	
				1,1-Dichloroethane	5U	ug/l		2,2-Dichloropropane	5U	ug/l	
				1,1-Dichloroethene	5U	ug/l		2-Hexanone	10U	ug/l	
				Trichlorofluoromethane	5U	ug/l		Ethane, 1,1,1,2-Tetrac+	5U	ug/l	
				Methane, Dichlorodiflu+	10U	ug/l		cis-1,3-Dichloropropene	5U	ug/l	
				1,2-Dichloropropane	5U	ug/l		trans-1,3-Dichloroprop+	5U	ug/l	
				2-Butanone	10U	ug/l		Surrog: D4-1,2-Dichlor+	93	% Recov	
				1,1,2-Trichloroethane	5U	ug/l		Surrog: 1,4-Bromofluor+	102	% Recov	
				Trichloroethene	5U	ug/l		Surrog: D8-Toluene	102	% Recov	
				ETHANE, 1,1,2,2-TETRAC+	5U	ug/l					
				1,2,3-Trichlorobenzene	5U	ug/l					
				Hexachlorobutadiene	5U	ug/l					
				Naphthalene	5U	ug/l					
				Total Xylenes	5U	ug/l					
				2-Chlorotoluene	5U	ug/l					
				1,2-Dichlorobenzene	5U	ug/l					
				1,2,4-Trimethylbenzene	5U	ug/l					
				DBCP	5U	ug/l					
				1,2,3-Trichloropropane	5U	ug/l					
				Tert-Butylbenzene	5U	ug/l					
				Isopropylbenzene (Cume+	5U	ug/l					
				p-Isopropyltoluene	5U	ug/l					
				BENZENE, ETHYL-	5U	ug/l					
				BENZENE, ETHENYL-	5U	ug/l					
				BENZENE, PROPYL-	5U	ug/l					
				Butylbenzene	5U	ug/l					
				4-Chlorotoluene	5U	ug/l					
				1,4-Dichlorobenzene	5U	ug/l					
				1,2-Dibromoethane (EDB)	10U	ug/l					
				1,2-Dichloroethane	5U	ug/l					
				Vinyl Acetate	10U	ug/l					

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378133

Description: CHATTARY

Source: Ambient Stream/River

Begin Date: 89/09/12 :

Gen Inorg/Phys-Speci		Water-Total Result Units		Metals - Total Recov		Water-Total Result Units		VOA - PP Scan (GCMS) *** Continued ***		Water Total Result Units		
Cond@25C	Meter	167 *	umho/cm	Calcium	Tot-Rec	26.8 *	mg/l	Isopropylbenzene (Cume+		5U	ug/l	
pH LAB	Meter	8.4 *	Std Units	Mgnsium	Tot-Rec	5.67 *	mg/l	p-Isopropyltoluene		5U	ug/l	
Alk-Tot	CaCO3	92 *	mg/l	Sodium	Tot-Rec	4.74 *	mg/l	BENZENE, ETHYL-		5U	ug/l	
Alk-HCO3	CaCO3	93 *	mg/l	Potssium	Tot-Rec	1.7 *	mg/l	BENZENE, ETHENYL		5U	ug/l	
Alk-CO3	CaCO3	1U	mg/l	Iron	Tot-Rec	66.4 *	ug/l	BENZENE, PROPYL-		5U	ug/l	
Hard-Tot	CaCO3	97 *	mg/l	Mangnese	Tot-Rec	9.1 *	ug/l	Butylbenzene		5U	ug/l	
Silica	Total	16.0 *	mg/l					4-Chlorotoluene		5U	ug/l	
Turbidty	Meter	1.6 *	NTU					1,4-Dichlorobenzene		5U	ug/l	
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				VOA - PP Scan (GCMS)		Water-Total Result Units						
Solids - Specified		Water-Total Result Units		Carbon Tetrachloride		5U ug/l		1,2-Dibromoethane (EDB)				10U ug/l
Solids T-Suspen		1U mg/l		Acetone		10U ug/l		1,2-Dichloroethane				5U ug/l
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				Chloroform		5U ug/l		Vinyl Acetate				10U ug/l
Nutrients - Specifie		Water-Total Result Units		Benzene		5U ug/l		4-Methyl-2-Pentanone				10U ug/l
NO2NO3-N Total		0.17 * mg/l		1,1,1-Trichloroethane		5U ug/l		1,3,5-Trimethylbenzene				5U ug/l
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				Bromomethane		10U ug/l		Bromobenzene				5U ug/l
Metals - Total Recov		Water Total Result Units		Chloromethane		10U ug/l		Toluene				5U ug/l
Cadmium Tot-Rec		0.20U ug/l		Dibromomethane		5U ug/l		Chlorobenzene				5U ug/l
Mercury Tot-Rec		.06U ug/l		Bromochloromethane		5U ug/l		1,2,4-Trichlorobenzene				5U ug/l
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				Chloroethane		10U ug/l		Dibromochloromethane				5U ug/l
Metals - Total Recov		Water Total Result Units		Vinyl Chloride		10U ug/l		Tetrachloroethene				5U ug/l
Matrix Spike #1				Methylene Chloride		5U ug/l		Sec-Butylbenzene				5U ug/l
Mercury Tot-Rec		108 % Recov		Carbon Disulfide		5U ug/l		1,3-Dichloropropane				5U ug/l
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				Bromoform		5U ug/l		Cis-1,2-Dichloroethene				5U ug/l
Metals - Total Recov		Water-Total Result Units		1,1-Dichloroethane		5U ug/l		trans-1,2-Dichloroethe+				5U ug/l
Matrix Spike #2				Trichlorofluoromethane		5U ug/l		1,3-Dichlorobenzene				5U ug/l
Mercury Tot-Rec		118 % Recov		1,1,1,2-Tetrac+		5U ug/l		1,1-Dichloropropene				5U ug/l
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				Methane, Dichlorodiflu+		10U ug/l		2,2-Dichloropropane				5U ug/l
Metals - Total Recov		Water-Total Result Units		1,2-Dichloropropane		5U ug/l		Ethane, 1,1,1,2-Tetrac+				5U ug/l
Matrix Spike #1				2-Butanone		10U ug/l		cis-1,3-Dichloropropene				5U ug/l
Mercury Tot-Rec		108 % Recov		1,1,2-Trichloroethane		5U ug/l		trans-1,3-Dichloroprop+				5U ug/l
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				Trichloroethene		5U ug/l		Surrog: D4-1,2-Dichlor+				95 % Recov
Metals - Total Recov		Water-Total Result Units		ETHANE, 1,1,2,2-TETRAC+		5U ug/l		Surrog: 1,4-Bromofluor+				98 % Recov
Matrix Spike #2				1,2,3-Trichlorobenzene		5U ug/l		Surrog: D8-Toluene				103 % Recov
Mercury Tot-Rec		118 % Recov		Hexachlorobutadiene		5U ug/l		+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				Naphthalene		5U ug/l		VOA - PP Scan (GCMS)				Water-Total Result Units
Metals - Total Recov		Water-Total Result Units		Total Xylenes		5U ug/l		Matrix Spike #1				
Matrix Spike #1				2-Chlorotoluene		5U ug/l		Carbon Tetrachloride				95 % Recov
Mercury Tot-Rec		118 % Recov		1,2-Dichlorobenzene		5U ug/l		Acetone				10U % Recov
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+				1,2,4-Trimethylbenzene		5U ug/l		Chloroform				98 % Recov
Metals - Total Recov		Water-Total Result Units		DBCP		5U ug/l		Benzene				110 % Recov
Matrix Spike #2				1,2,3-Trichloropropane		5U ug/l		1,1,1-Trichloroethane				101 % Recov
Mercury Tot-Rec		118 % Recov		Tert-Butylbenzene		5U ug/l		Bromomethane				110 % Recov

(Continued on next page)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378133

Description: CHATTARY

Source: Ambient Stream/River

Begin Date: 89/09/12 :

VOA - PP Scan (GCMS) *** Continued ***			VOA - PP Scan (GCMS) *** Continued ***			VOA - PP Scan (GCMS) *** Continued ***		
Matrix Spike #1	Result	Units	Matrix Spike #1	Result	Units	Matrix Spike #2	Result	Units
Chloromethane	114	% Recov	1,2,4-Trichlorobenzene	94	% Recov	Trichloroethene	100	% Recov
Dibromomethane	102	% Recov	Dibromochloromethane	110	% Recov	ETHANE, 1,1,2,2-TETRAC+	104	% Recov
Bromochloromethane	5U	% Recov	Tetrachloroethene	90	% Recov	1,2,3-Trichlorobenzene	97	% Recov
Chloroethane	113	% Recov	Sec-Butylbenzene	84	% Recov	Hexachlorobutadiene	75	% Recov
Vinyl Chloride	103	% Recov	1,3-Dichloropropane	115	% Recov	Naphthalene	106	% Recov
Methylene Chloride	99B	% Recov	Cis-1,2-Dichloroethene	100	% Recov	Total Xylenes	90	% Recov
Carbon Disulfide	5U	% Recov	trans-1,2-Dichloroethe+	94	% Recov	2-Chlorotoluene	90	% Recov
Bromoform	109	% Recov	1,3-Dichlorobenzene	99	% Recov	1,2-Dichlorobenzene	95	% Recov
Bromodichloromethane	127	% Recov	1,1-Dichloropropene	98	% Recov	1,2,4-Trimethylbenzene	86	% Recov
1,1-Dichloroethane	112	% Recov	2,2-Dichloropropane	80	% Recov	DBCP	117	% Recov
1,1-Dichloroethene	93	% Recov	2-Hexanone	140	% Recov	1,2,3-Trichloropropane	110	% Recov
Trichlorofluoromethane	102	% Recov	Ethane, 1,1,1,2-Tetrac+	105	% Recov	Tert-Butylbenzene	86	% Recov
Methane, Dichlorodiflu+	97	% Recov	cis-1,3-Dichloropropene	109	% Recov	Isopropylbenzene (Cume+	85	% Recov
1,2-Dichloropropane	86	% Recov	trans-1,3-Dichloroprop+	105	% Recov	p-Isopropyltoluene	80	% Recov
2-Butanone	154	% Recov	Surrog: D4-1,2-Dichlor+	102	% Recov	BENZENE, ETHYL-	90	% Recov
1,1,2-Trichloroethane	112	% Recov	Surrog: 1,4-Bromofluor+	99	% Recov	BENZENE, ETHENYL-	96	% Recov
Trichloroethene	102	% Recov	Surrog: D8 Toluene	105	% Recov	BENZENE, PROPYL-	83	% Recov
ETHANE, 1,1,2,2-TETRAC+	108	% Recov			Butylbenzene	82	% Recov	
1,2,3-Trichlorobenzene	103	% Recov			4-Chlorotoluene	89	% Recov	
Hexachlorobutadiene	82	% Recov	VOA - PP Scan (GCMS)	Water-Total		1,4-Dichlorobenzene	89	% Recov
Naphthalene	110	% Recov	Matrix Spike #2	Result	Units	1,2-Dibromoethane (EDB)	114	% Recov
Total Xylenes	95	% Recov				1,2-Dichloroethane	98	% Recov
2-Chlorotoluene	91	% Recov	Carbon Tetrachloride	93	% Recov	Vinyl Acetate	56	% Recov
1,2-Dichlorobenzene	99	% Recov	Acetone	10U	% Recov	4-Methyl-2-Pentanone	130	% Recov
1,2,4-Trimethylbenzene	90	% Recov	Chloroform	92	% Recov	1,3,5-Trimethylbenzene	84	% Recov
DBCP	115	% Recov	Benzene	104	% Recov	Bromobenzene	101	% Recov
1,2,3-Trichloropropane	115	% Recov	1,1,1-Trichloroethane	94	% Recov	Toluene	101	% Recov
Tert-Butylbenzene	90	% Recov	Bromomethane	103	% Recov	Chlorobenzene	98	% Recov
Isopropylbenzene (Cume+	89	% Recov	Chloromethane	110	% Recov	1,2,4-Trichlorobenzene	92	% Recov
p-Isopropyltoluene	86	% Recov	Dibromomethane	106	% Recov	Dibromochloromethane	111	% Recov
BENZENE, ETHYL-	95	% Recov	Bromochloromethane	5U	% Recov	Tetrachloroethene	83	% Recov
BENZENE, ETHENYL-	98	% Recov	Chloroethane	100	% Recov	Sec-Butylbenzene	81	% Recov
BENZENE, PROPYL-	88	% Recov	Vinyl Chloride	97	% Recov	1,3-Dichloropropane	116	% Recov
Butylbenzene	83	% Recov	Methylene Chloride	93B	% Recov	Cis-1,2-Dichloroethene	88	% Recov
4-Chlorotoluene	95	% Recov	Carbon Disulfide	5U	% Recov	trans-1,2-Dichloroethe+	88	% Recov
1,4-Dichlorobenzene	92	% Recov	Bromoform	106	% Recov	1,3-Dichlorobenzene	94	% Recov
1,2-Dibromoethane (EDB)	114	% Recov	Bromodichloromethane	131	% Recov	1,1-Dichloropropene	89	% Recov
1,2-Dichloroethane	103	% Recov	1,1-Dichloroethane	101	% Recov	2,2-Dichloropropane	72	% Recov
Vinyl Acetate	78	% Recov	1,1-Dichloroethene	83	% Recov	2-Hexanone	140	% Recov
4-Methyl-2-Pentanone	130	% Recov	Trichlorofluoromethane	87	% Recov	Ethane, 1,1,1,2-Tetrac+	103	% Recov
1,3,5-Trimethylbenzene	91	% Recov	Methane, Dichlorodiflu+	90	% Recov	cis-1,3-Dichloropropene	109	% Recov
Bromobenzene	104	% Recov	1,2-Dichloropropane	96	% Recov	trans-1,3-Dichloroprop+	108	% Recov
Toluene	104	% Recov	2-Butanone	140	% Recov	Surrog: D4-1,2-Dichlor+	103	% Recov
Chlorobenzene	103	% Recov	1,1,2-Trichloroethane	111	% Recov	Surrog: 1,4-Bromofluor+	99B	% Recov

(Continued on next page)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378133

Description: CHATTARY

Source: Ambient Stream/River

Begin Date: 89/09/12 :

+-----+-----+			
VOA - PP Scan (GCMS)		Water-Total	
*** Continued ***			
Matrix Spike #2		Result	Units
+-----+-----+			
Surrog: D8-Toluene		104	% Recov

+-----+-----+			
Ion Chromatography		Water-Total	
		Result	Units
+-----+-----+			
Chloride		1.63	* mg/l
Sulfate Total		4.76	* mg/l

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378134

Description: CHATTARY

Source: Ambient Stream/River

Begin Date: 89/09/13 :

Gen Inorg/Phys-Speci		Water-Total		VOA - PP Scan (GCMS)		Water-Total		VOA - PP Scan (GCMS)		Water-Total	
		Result	Units			Result	Units	*** Continued ***		Result	Units
Cond@25C	Meter	185 *	umho/cm	Carbon Tetrachloride	5U	ug/l		4-Methyl-2-Pentanone	10U	ug/l	
pH LAB	Meter	7.9 *	Std Units	Acetone	10U	ug/l		1,3,5-Trimethylbenzene	5U	ug/l	
Alk-Tot	CaCO3	94 *	mg/l	Chloroform	5U	ug/l		Bromobenzene	5U	ug/l	
Alk-HCO3	CaCO3	94 *	mg/l	Benzene	5U	ug/l		Toluene	5U	ug/l	
Alk-CO3	CaCO3	1U	mg/l	1,1,1-Trichloroethane	5U	ug/l		Chlorobenzene	5U	ug/l	
Hard-Tot	CaCO3	100 *	mg/l	Bromomethane	10U	ug/l		1,2,4-Trichlorobenzene	5U	ug/l	
Silica	Total	16.5 *	mg/l	Chloromethane	10U	ug/l		Dibromochloromethane	5U	ug/l	
Turbidity	Meter	0.9 *	NTU	Dibromomethane	5U	ug/l		Tetrachloroethene	5U	ug/l	
				Bromochloromethane	5U	ug/l		Sec-Butylbenzene	5U	ug/l	
				Chloroethane	10U	ug/l		1,3-Dichloropropane	5U	ug/l	
Solids - Specified				Vinyl Chloride	10U	ug/l		Cis-1,2-Dichloroethene	5U	ug/l	
				Methylene Chloride	5U	ug/l		trans-1,2-Dichloroethene	5U	ug/l	
Solids	T-Suspen	2 *	mg/l	Carbon Disulfide	5U	ug/l		1,3-Dichlorobenzene	5U	ug/l	
				Bromoform	5U	ug/l		1,1-Dichloropropene	5U	ug/l	
				Bromodichloromethane	5U	ug/l		2,2-Dichloropropane	5U	ug/l	
				1,1-Dichloroethane	5U	ug/l		2-Hexanone	10U	ug/l	
Nutrients - Specified				1,1-Dichloroethene	5U	ug/l		Ethane, 1,1,1,2-Tetrac	5U	ug/l	
				Trichlorofluoromethane	5U	ug/l		cis-1,3-Dichloropropene	5U	ug/l	
NO2NO3-N	Total	0.19 *	mg/l	Methane, Dichlorodiflu	10U	ug/l		trans-1,3-Dichloroprop	5U	ug/l	
				1,2-Dichloropropane	5U	ug/l		Surrog: D4-1,2-Dichlor	96	% Recov	
				2-Butanone	10U	ug/l		Surrog: 1,4-Bromofluor	102	% Recov	
				1,1,2-Trichloroethane	5U	ug/l		Surrog: D8-Toluene	103	% Recov	
Metals - Total Recov				Trichloroethene	5U	ug/l					
				ETHANE, 1,1,2,2-TETRAC	5U	ug/l					
				1,2,3-Trichlorobenzene	5U	ug/l					
Cadmium	Tot-Rec	0.20U	ug/l	Hexachlorobutadiene	5U	ug/l					
Mercury	Tot-Rec	.06U	ug/l	Naphthalene	5U	ug/l					
				Total Xylenes	5U	ug/l					
				2-Chlorotoluene	5U	ug/l					
Metals - Total Recov				1,2-Dichlorobenzene	5U	ug/l					
				1,2,4-Trimethylbenzene	5U	ug/l					
				DBCP	5U	ug/l					
Calcium	Tot-Rec	26.9 *	mg/l	1,2,3-Trichloropropane	5U	ug/l					
Magnesium	Tot-Rec	5.72 *	mg/l	Tert-Butylbenzene	5U	ug/l					
Sodium	Tot-Rec	4.74 *	mg/l	Isopropylbenzene (Cume	5U	ug/l					
Potassium	Tot-Rec	1.8 *	mg/l	p-Isopropyltoluene	5U	ug/l					
Iron	Tot-Rec	67.2 *	ug/l	BENZENE, ETHYL-	5U	ug/l					
Manganese	Tot-Rec	11.1 *	ug/l	BENZENE, ETHENYL-	5U	ug/l					
				BENZENE, PROPYL-	5U	ug/l					
				Butylbenzene	5U	ug/l					
				4-Chlorotoluene	5U	ug/l					
				1,4-Dichlorobenzene	5U	ug/l					
				1,2-Dibromoethane (EDB)	10U	ug/l					
				1,2-Dichloroethane	5U	ug/l					
				Vinyl Acetate	10U	ug/l					

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378135

Description: CHATTARY

Source: Ambient Stream/River

Begin Date: 89/09/12 :

Gen Inorg/Phys-Speci		Water-Total		VOA - PP Scan (GCMS)		Water-Total		VOA - PP Scan (GCMS)		Water-Total			
		Result	Units			Result	Units	*** Continued ***		Result	Units		
Cond@25C	Meter	179 *	umho/cm	Carbon Tetrachloride	5U	ug/l		4-Methyl-2-Pentanone	10U	ug/l			
pH LAB	Meter	8.3 *	Std Units	Acetone	10U	ug/l		1,3,5-Trimethylbenzene	5U	ug/l			
Alk-Tot	CaCO3	94 *	mg/l	Chloroform	5U	ug/l		Bromobenzene	5U	ug/l			
Alk-HCO3	CaCO3	94 *	mg/l	Benzene	5U	ug/l		Toluene	5U	ug/l			
Alk-CO3	CaCO3	1U	mg/l	1,1,1-Trichloroethane	5U	ug/l		Chlorobenzene	5U	ug/l			
Hard-Tot	CaCO3	98 *	mg/l	Bromomethane	10U	ug/l		1,2,4-Trichlorobenzene	5U	ug/l			
Silica	Total	16.9 *	mg/l	Chloromethane	10U	ug/l		Dibromochloromethane	5U	ug/l			
Turbidity	Meter	1.2 *	NTU	Dibromomethane	5U	ug/l		Tetrachloroethene	5U	ug/l			
-----				Bromochloromethane	5U	ug/l		Sec-Butylbenzene	5U	ug/l			
Solids - Specified		Water-Total		Chloroethane	10U	ug/l		1,3-Dichloropropane	5U	ug/l			
		Result	Units	Vinyl Chloride	10U	ug/l		Cis-1,2-Dichloroethene	5U	ug/l			
-----				Methylene Chloride	5U	ug/l		trans-1,2-Dichloroethe+	5U	ug/l			
Solids	T-Suspen	1 *	mg/l	Carbon Disulfide	5U	ug/l		1,3-Dichlorobenzene	5U	ug/l			
-----				Bromoform	5U	ug/l		1,1-Dichloropropene	5U	ug/l			
Nutrients - Specifie		Water-Total		Bromodichloromethane	5U	ug/l		2,2-Dichloropropane	5U	ug/l			
		Result	Units	1,1-Dichloroethane	5U	ug/l		2-Hexanone	10U	ug/l			
-----				1,1-Dichloroethene	5U	ug/l		Ethane, 1,1,1,2-Tetrac+	5U	ug/l			
NO2NO3-N	Total	0.18 *	mg/l	Trichlorofluoromethane	5U	ug/l		cis-1,3-Dichloropropene	5U	ug/l			
-----				Methane, Dichlorodiflu+	10U	ug/l		trans-1,3-Dichloroprop+	5U	ug/l			
Metals - Total Recov		Water-Total		1,2-Dichloropropane	5U	ug/l		Surrog: D4-1,2-Dichlor+	96	% Recov			
		Result	Units	2-Butanone	10U	ug/l		Surrog: 1,4-Bromofluor+	98	% Recov			
-----				1,1,2-Trichloroethane	5U	ug/l		Surrog: D8-Toluene	103	% Recov			
Cadmium	Tot-Rec	0.20U	ug/l	Trichloroethene	5U	ug/l		-----					
Mercury	Tot-Rec	.06U	ug/l	ETHANE, 1,1,2,2-TETRAC+	5U	ug/l		Ion Chromatography		Water-Total			
-----				1,2,3-Trichlorobenzene	5U	ug/l				Result	Units		
Metals - Total Recov		Water-Total		Hexachlorobutadiene	5U	ug/l		-----					
		Result	Units	Naphthalene	5U	ug/l		Chloride			3.21 *	mg/l	
-----				Total Xylenes	5U	ug/l		Sulfate	Total			4.88 *	mg/l
Calcium	Tot-Rec	27.4 *	mg/l	2-Chlorotoluene	5U	ug/l		-----					
Mgnsium	Tot-Rec	5.74 *	mg/l	1,2-Dichlorobenzene	5U	ug/l							
Sodium	Tot-Rec	4.77 *	mg/l	1,2,4-Trimethylbenzene	5U	ug/l							
Potssium	Tot-Rec	1.9 *	mg/l	DBCP	5U	ug/l							
Iron	Tot-Rec	54.9 *	ug/l	1,2,3-Trichloropropane	5U	ug/l							
Mangnese	Tot-Rec	9.1 *	ug/l	Tert-Butylbenzene	5U	ug/l							
				Isopropylbenzene (Cume+	5U	ug/l							
				p-Isopropyltoluene	5U	ug/l							
				BENZENE, ETHYL-	5U	ug/l							
				BENZENE, ETHENYL-	5U	ug/l							
				BENZENE, PROPYL-	5U	ug/l							
				Butylbenzene	5U	ug/l							
				4-Chlorotoluene	5U	ug/l							
				1,4-Dichlorobenzene	5U	ug/l							
				1,2-Dibromoethane (EDB)	10U	ug/l							
				1,2-Dichloroethane	5U	ug/l							
				Vinyl Acetate	10U	ug/l							

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378136

Description: TRNSFRBK

Source: Ambient Stream/River

Begin Date: 89/09/12 :

VOA - PP Scan (GCMS)		Water-Total		VOA - PP Scan (GCMS)		Water-Total	
		Result	Units	*** Continued ***		Result	Units
Carbon Tetrachloride		5U	ug/l	4-Methyl-2-Pentanone		10U	ug/l
Acetone		10U	ug/l	1,3,5-Trimethylbenzene		5U	ug/l
Chloroform		5U	ug/l	Bromobenzene		5U	ug/l
Benzene		5U	ug/l	Toluene		5U	ug/l
1,1,1-Trichloroethane		5U	ug/l	Chlorobenzene		5U	ug/l
Bromomethane		10U	ug/l	1,2,4-Trichlorobenzene		5U	ug/l
Chloromethane		10U	ug/l	Dibromochloromethane		5U	ug/l
Dibromomethane		5U	ug/l	Tetrachloroethene		5U	ug/l
Bromochloromethane		5U	ug/l	Sec-Butylbenzene		5U	ug/l
Chloroethane		10U	ug/l	1,3-Dichloropropane		5U	ug/l
Vinyl Chloride		10U	ug/l	Cis-1,2-Dichloroethene		5U	ug/l
Methylene Chloride		5U	ug/l	trans-1,2-Dichloroethene		5U	ug/l
Carbon Disulfide		5U	ug/l	1,3-Dichlorobenzene		5U	ug/l
Bromoform		5U	ug/l	1,1-Dichloropropene		5U	ug/l
Bromodichloromethane		5U	ug/l	2,2-Dichloropropane		5U	ug/l
1,1-Dichloroethane		5U	ug/l	2-Hexanone		10U	ug/l
1,1-Dichloroethene		5U	ug/l	Ethane, 1,1,1,2-Tetrachloro-		5U	ug/l
Trichlorofluoromethane		5U	ug/l	cis-1,3-Dichloropropane		5U	ug/l
Methane, Dichlorodifluoro-		10U	ug/l	trans-1,3-Dichloropropane		5U	ug/l
1,2-Dichloropropane		5U	ug/l	Surrog: D4-1,2-Dichloroethene		96	% Recov
2-Butanone		10U	ug/l	Surrog: 1,4-Bromofluorobenzene		98	% Recov
1,1,2-Trichloroethane		5U	ug/l	Surrog: D8-Toluene		101	% Recov
Trichloroethene		5U	ug/l				
ETHANE, 1,1,2,2-TETRACHLORO-		5U	ug/l				
1,2,3-Trichlorobenzene		5U	ug/l				
Hexachlorobutadiene		5U	ug/l				
Naphthalene		5U	ug/l				
Total Xylenes		5U	ug/l				
2-Chlorotoluene		5U	ug/l				
1,2-Dichlorobenzene		5U	ug/l				
1,2,4-Trimethylbenzene		5U	ug/l				
DBCP		5U	ug/l				
1,2,3-Trichloropropane		5U	ug/l				
Tert-Butylbenzene		5U	ug/l				
Isopropylbenzene (Cumene)		5U	ug/l				
p-Isopropyltoluene		5U	ug/l				
BENZENE, ETHYL-		5U	ug/l				
BENZENE, ETHENYL-		5U	ug/l				
BENZENE, PROPYL-		5U	ug/l				
Butylbenzene		5U	ug/l				
4-Chlorotoluene		5U	ug/l				
1,4-Dichlorobenzene		5U	ug/l				
1,2-Dibromoethane (EDB)		10U	ug/l				
1,2-Dichloroethane		5U	ug/l				
Vinyl Acetate		10U	ug/l				

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Laboratory: Ecology, Manchester

Sample No: 89 378137

Description: TRNSPTBK

Source: Ambient Stream/River

Begin Date: 89/09/12 :

Metals - Total Recov		Water-Total Result Units		VOA - PP Scan (GCMS)		Water-Total Result Units	
				*** Continued ***			
Cadmium	Tot-Rec	0.20U	ug/l				
Mercury	Tot-Rec	.06U	ug/l				
-----				-----			
Metals - Total Recov				VOA - PP Scan (GCMS)			
		Water-Total Result Units				Water-Total Result Units	
-----				-----			
Iron	Tot-Rec	5.0U	ug/l	DBCP		5U	ug/l
Manganese	Tot-Rec	2.0 *	ug/l	1,2,3-Trichloropropane		5U	ug/l
-----				-----			
Metals - Total Recov				Tert-Butylbenzene			
		Water-Total Result Units		Isopropylbenzene (Cume+		5U ug/l	
-----				p-Isopropyltoluene			
-----				BENZENE, ETHYL-			
-----				BENZENE, ETHENYL-			
-----				BENZENE, PROPYL-			
-----				Butylbenzene			
-----				4-Chlorotoluene			
-----				1,4-Dichlorobenzene			
-----				1,2-Dibromoethane (EDB)			
-----				1,2-Dichloroethane			
-----				Vinyl Acetate			
-----				4-Methyl-2-Pentanone			
-----				1,3,5-Trimethylbenzene			
-----				Bromobenzene			
-----				Toluene			
-----				Chlorobenzene			
-----				1,2,4-Trichlorobenzene			
-----				Dibromochloromethane			
-----				Tetrachloroethene			
-----				Sec-Butylbenzene			
-----				1,3-Dichloropropane			
-----				Cis-1,2-Dichloroethene			
-----				trans-1,2-Dichloroethe+			
-----				1,3-Dichlorobenzene			
-----				1,1-Dichloropropene			
-----				2,2-Dichloropropane			
-----				2-Hexanone			
-----				Ethane, 1,1,1,2-Tetrac+			
-----				cis-1,3-Dichloropropene			
-----				trans-1,3-Dichloroprop+			
-----				Surrog: D4-1,2-Dichlor+			
-----				Surrog: 1,4-Bromofluor+			
-----				Surrog: D8-Toluene			
-----				-----			
Carbon Tetrachloride		5U	ug/l				
Acetone		10U	ug/l				
Chloroform		5U	ug/l				
Benzene		5U	ug/l				
1,1,1-Trichloroethane		5U	ug/l				
Bromomethane		10U	ug/l				
Chloromethane		10U	ug/l				
Dibromomethane		5U	ug/l				
Bromochloromethane		5U	ug/l				
Chloroethane		10U	ug/l				
Vinyl Chloride		10U	ug/l				
Methylene Chloride		5U	ug/l				
Carbon Disulfide		5U	ug/l				
Bromoform		5U	ug/l				
Bromodichloromethane		5U	ug/l				
1,1-Dichloroethane		5U	ug/l				
1,1-Dichloroethene		5U	ug/l				
Trichlorofluoromethane		5U	ug/l				
Methane, Dichlorodiflu+		10U	ug/l				
1,2-Dichloropropane		5U	ug/l				
2-Butanone		10U	ug/l				
1,1,2-Trichloroethane		5U	ug/l				
Trichloroethene		5U	ug/l				
ETHANE, 1,1,2,2-TETRAC+		5U	ug/l				
1,2,3-Trichlorobenzene		5U	ug/l				
Hexachlorobutadiene		5U	ug/l				
Naphthalene		5U	ug/l				
Total Xylenes		5U	ug/l				
2-Chlorotoluene		5U	ug/l				
1,2-Dichlorobenzene		5U	ug/l				
1,2,4-Trimethylbenzene		5U	ug/l				

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Blank ID: BW9268

VOA - PP Scan (GCMS) Blank #1	Water-Total Result	Units	VOA - PP Scan (GCMS) *** Continued *** Blank #1	Water-Total Result	Units
Carbon Tetrachloride	5U	ug/l	4-Methyl-2-Pentanone	10U	ug/l
Acetone	10U	ug/l	1,3,5-Trimethylbenzene	5U	ug/l
Chloroform	5U	ug/l	Bromobenzene	5U	ug/l
Benzene	5U	ug/l	Toluene	5U	ug/l
1,1,1-Trichloroethane	5U	ug/l	Chlorobenzene	5U	ug/l
Bromomethane	10U	ug/l	1,2,4-Trichlorobenzene	5U	ug/l
Chloromethane	10U	ug/l	Dibromochloromethane	5U	ug/l
Dibromomethane	5U	ug/l	Tetrachloroethene	5U	ug/l
Bromochloromethane	5U	ug/l	Sec-Butylbenzene	5U	ug/l
Chloroethane	10U	ug/l	1,3-Dichloropropane	5U	ug/l
Vinyl Chloride	10U	ug/l	Cis-1,2-Dichloroethene	5U	ug/l
Methylene Chloride	2J*	ug/l	trans-1,2-Dichloroethe+	5U	ug/l
Carbon Disulfide	5U	ug/l	1,3-Dichlorobenzene	5U	ug/l
Bromoform	5U	ug/l	1,1-Dichloropropene	5U	ug/l
Bromodichloromethane	5U	ug/l	2,2-Dichloropropene	5U	ug/l
1,1-Dichloroethane	5U	ug/l	2-Hexanone	10U	ug/l
1,1-Dichloroethene	5U	ug/l	Ethane, 1,1,1,2-Tetrac+	5U	ug/l
Trichlorofluoromethane	5U	ug/l	cis-1,3-Dichloropropene	5U	ug/l
Methane, Dichlorodiflu+	10U	ug/l	trans-1,3-Dichloroprop+	5U	ug/l
1,2-Dichloropropane	5U	ug/l	Surrog: D4-1,2-Dichlor+	89	% Recov
2-Butanone	10U	ug/l	Surrog: 1,4-Bromofluor+	98	% Recov
1,1,2-Trichloroethane	5U	ug/l	Surrog: D8-Toluene	104	% Recov
Trichloroethene	5U	ug/l			
ETHANE, 1,1,2,2-TETRAC+	5U	ug/l			
1,2,3-Trichlorobenzene	5U	ug/l			
Hexachlorobutadiene	5U	ug/l			
Naphthalene	5U	ug/l			
Total Xylenes	5U	ug/l			
2-Chlorotoluene	5U	ug/l			
1,2-Dichlorobenzene	5U	ug/l			
1,2,4-Trimethylbenzene	5U	ug/l			
DBCP	5U	ug/l			
1,2,3 Trichloropropane	5U	ug/l			
Tert-Butylbenzene	5U	ug/l			
Isopropylbenzene (Cume+	5U	ug/l			
p-Isopropyltoluene	5U	ug/l			
BENZENE, ETHYL-	5U	ug/l			
BENZENE, ETHENYL-	5U	ug/l			
BENZENE, PROPYL-	5U	ug/l			
Butylbenzene	5U	ug/l			
4-Chlorotoluene	5U	ug/l			
1,4-Dichlorobenzene	5U	ug/l			
1,2-Dibromoethane (EDB)	10U	ug/l			
1,2-Dichloroethane	5U	ug/l			
Vinyl Acetate	10U	ug/l			

(Sample Complete)

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Washington State Department of Ecology
Sample/Project Analysis Results

Page 13

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Blank ID: PB 41.72

Metals - Total Recov		Water-Total	
Blank #1		Result	Units
Cadmium	Tot-Rec	0.37 *	ug/l

Metals - Total Recov		Water-Total	
Blank #2		Result	Units
Calcium	Tot-Rec	.0010U	mg/l
Mgnsium	Tot-Rec	.0010U	mg/l
Sodium	Tot-Rec	.046 *	mg/l
Potssium	Tot-Rec	.50U	mg/l
Iron	Tot-Rec	5.0U	ug/l
Mangnese	Tot-Rec	1.0U	ug/l

(Sample Complete)

Project: DOE-077F LITTLE SPOKANE RIVER (WASH. LAKES)

Officer: AFJ

Account: D3400

Blank ID: PB 44.73

Metals - Total Recov		Water-Total	
Blank #2		Result	Units
Cadmium	Tot-Rec	0.20U	ug/l

Metals - Total Recov		Water-Total	
Blank #1		Result	Units
Calcium	Tot-Rec	.0010U	mg/l
Mgnsium	Tot-Rec	.0010U	mg/l
Sodium	Tot-Rec	.044 *	mg/l
Potssium	Tot-Rec	.50U	mg/l
Iron	Tot-Rec	5.0U	ug/l
Manqnese	Tot-Rec	1.0U	ug/l

{Sample Complete}