



CITY OF PORTLAND ENVIRONMENTAL SERVICES



1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ■ Dan Saltzman, Commissioner ■ Dean Marriott, Director

TECHNICAL MEMORANDUM No. OF22B-4

Outfall Basin 22B Inline Solids Investigation

TO: Karen Tarnow, Oregon Department of Environmental Quality (DEQ)
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DATE: August 7, 2009
SUBJECT: Portland Harbor Source Investigation

Introduction

This technical memorandum summarizes the results of the City of Portland BES source investigation of inline solids in the Outfall Basin 22B shared stormwater conveyance system. The City deployed inline sediment traps in late 2007 to collect stormwater solids from two locations within Basin 22B. The purpose of the City sampling was to investigate the presence of contaminant sources in the upper portion of the basin in response to an evaluation of Lower Willamette Group (LWG) solids and stormwater data collected in Basin 22B (Anchor and Integral, 2008). The LWG data indicated that upland sources are discharging contaminants to the Basin 22B stormwater conveyance system.

Due to limited sediment volume in the City traps, the samples were not analyzed for all target constituents proposed in the Sampling and Analysis Plan (SAP) (BES, 2007). However, the resulting data set indicates that the adjacent Air Liquide site and the Metro Central Transfer Station site (Metro site) may be significant uncontrolled sources of PCBs, pesticides and metals to the Basin 22B stormwater conveyance system.

This inline solids investigation is part of the City's ongoing Remedial Investigation associated with the Portland Harbor City of Portland Outfalls Project being conducted pursuant to the August 13, 2003, Intergovernmental Agreement (IGA) between DEQ and the City. This investigation addresses the following joint City/DEQ objectives for Basin 22B under the IGA:

- Identify significant sources of contaminants to the outfall; and
- Collect and evaluate sufficient data to determine if source control measures are needed.

The data collected under this investigation support ongoing work by DEQ and the City to characterize and control discharges to the stormwater pathway from the Air Liquide and Metro sites.

Basin 22B Configuration and Background

Outfall 22B discharges to the west side of the Willamette River at approximately river mile 6.8. Basin 22B is a 32-acre stormwater basin (see Figure 1), which is zoned entirely industrial. The system consists of one main branch that runs from southeast to northwest along NW Front Avenue. At the Guilds Lake wastewater pump station, the 60-inch-diameter storm line branches into two 48-inch-diameter lines before reconnecting upstream of the 48-inch-diameter outfall.

The Basin 22B conveyance system receives stormwater discharges from the following industrial properties, all of which are DEQ environmental cleanup sites (ECSI): Arkema (ECSI No. 398), Air Liquide/Schnitzer – Doane Lake (ECSI No. 395), and Metro Central Transfer Station (ECSI No. 1398). The system also receives stormwater runoff from the vegetated cap at the Gould Battery site (ECSI No. 49), which has been remediated under EPA oversight, and catch basins along NW Front Avenue. The Metro Central Transfer Station and Air Liquide facilities have National Pollution Discharge Elimination System (NPDES) stormwater permits for industrial stormwater discharges to the Basin 22B conveyance system. The locations of the ECSI and NPDES sites are shown on Figure 1.

Groundwater contaminants from the adjacent Rhone Poulenc site (ECSI No. 155) infiltrate into the Basin 22B stormwater conveyance system. This site is working with DEQ to implement an Interim Remedial Action Measure, in the summer of 2009, to control groundwater infiltration by lining both private stormwater conveyance systems on the Air Liquide and Metro properties and the City's shared conveyance line in Basin 22B.

Sampling Activities

City Sampling Activities. The City sampling activities were completed in accordance with the SAP submitted to DEQ in December 2007.¹ The sediment trap locations were selected to characterize discharges from the Air Liquide and Metro sites. The City installed two sediment traps at each of the following locations on December 13, 2007 (locations are shown in Figure 1):

- "ST1" – Manhole AAM060: This sampling location was selected to represent contaminant contributions from a stormwater lateral connection serving the Metro site and a portion of the Air Liquide site. Traps were installed 1 foot downstream of the manhole in the 24-inch-diameter City stormwater conveyance line. This manhole is the manhole furthest upstream from Outfall 22B.
- "ST2" – Manhole AAL961: This sampling location was selected to represent contaminant contributions to the Basin 22B conveyance system from both the Metro and Air Liquide sites. The primary stormwater lateral from Air Liquide has been confirmed to connect between manholes AAL961 and AAM060. The traps were installed approximately 1.5 feet upstream of the manhole in the 24-inch line. This location is downstream of location "ST1".

The sediment traps in both locations were inspected monthly. Based on inspections conducted on March 19 and April 16, 2008, the sediment trap bottles at both locations were removed to archive collected solids. These bottles were replaced with new bottles for further solids

¹ Sediment trap station names ("ST1" and "ST2") assigned by the field crew reversed the names assigned in the SAP. This report and all field and lab data reflect this change.

collection. The second sets of sediment trap bottles were removed on May 28, 2008. A total of approximately 6 inches and 3.3 inches of solids had accumulated in the two sets of sediment trap bottles from ST1 and ST2, respectively. Photographs of the sediment traps in their installed locations are provided in Attachment A. Field notes taken during sediment trap installation, monitoring and removal activities are provided in Attachment B.

In accordance with BES's Standard Operating Procedure (SOP) 5.01b, "Sampling Stormwater Solids Using Inline Sediment Traps", field personnel attempted to filter the bottle contents to generate solids samples for laboratory analysis. However, the sample material clogged the filters and prevented solids from passing through. As a result, samples were centrifuged at the City's Water Pollution Control Laboratory (WPCL) to obtain sufficient volume for analyses. The filtering attempts and the centrifuge procedures are described in detail in the field notes (Attachment B).

Because of the consistency of the material in the sediment traps, the actual volume of sediments generated during the centrifuge process was limited. The SAP established a priority order for chemical analysis based on potential risk drivers within Portland Harbor. Specifically, where Basin 22B sediment volumes were insufficient to conduct all proposed analyses, analyses were to be conducted as feasible in the following order of priority: PCB congeners, total solids, total organic carbon (TOC), organochlorine pesticides, semivolatile organic compounds (full scan), low-level polycyclic aromatic hydrocarbons (PAHs) and phthalates, metals, chlorinated herbicides, PCB Aroclors, and grain size. For the Basin 22B samples, sample volume only was sufficient to conduct analyses for PCB congeners, total solids, TOC, pesticides, and metals.

LWG Sampling Activities. During the summer of 2007, the LWG collected a sediment trap solids sample from Basin 22B, at manhole AAJ650, located downstream of all upland site lateral connections to the basin (see Figure 1). The sample was analyzed for PCB congeners, total solids and TOC, and the resulting data are incorporated into this technical memorandum for comparison with the City data.

Summary of Results and Evaluation

Tables 1 and 2 summarize the laboratory analytical results for the City and LWG sediment trap samples relative to the Portland Harbor Joint Source Control Strategy (JSCS) screening level values (SLVs) for bioaccumulation and toxicity (DEQ/EPA, 2005, as amended 2007). The laboratory report and data review memorandum for the City samples are provided in Attachment C.

The analytical results for the two City sample locations are generally comparable, except for metals, and exceed concentrations in the downstream LWG sample, where data are available for comparison. The results are summarized as follows:

- **PCBs:** Concentrations of total PCBs in the ST1 and ST2 samples (1,280 and 1,250 $\mu\text{g/Kg}$, respectively; see Table 2) indicate significant PCB sources are present at the Air Liquide and/or the Metro sites. Total PCBs, in the LWG sediment trap sample (271 $\mu\text{g/Kg}$) were significantly lower, but were elevated above the JSCS Bioaccumulation SLV. The lower concentration in the LWG sample could be attributed to the different deployment period, dilution effects from contributions of the larger drainage basin, or the adsorption of PCBs to organic matter in the samples with higher TOC content.

- **Organochlorine Pesticides:** Pesticides were detected at elevated concentrations relative to the JSCS SLVs in both City samples (see Table 1). These data indicate the presence of DDx, chlordane, and dieldrin sources discharging to the system. The LWG sample was not analyzed for pesticides.
- **Metals:** The results for the City samples indicate that sources of cadmium, chromium, copper, lead, mercury and zinc are discharging to the system at location ST1. Metal concentrations in the ST1 sample, which receives discharges from the Metro site and a portion of the Air Liquide site, are much higher than in the ST2 sample (see Table 1). The LWG sample was not analyzed for metals.

Conclusions

The analytical data for the sediment trap samples collected by the City in Basin 22B indicate the presence of uncontrolled sources of PCBs, pesticides, and metals in the upper portion of Basin 22B. Metro and Air Liquide are the only upland sites discharging stormwater to this portion of the system. DEQ's Environmental Cleanup Site Information (ECSI) database states that the results of an initial site investigation indicate groundwater at the Metro site is contaminated with pesticides, herbicides, volatile organic compounds and metals, likely migrating from the adjacent Rhone Poulenc site (DEQ, 1995a). The ECSI database also indicates that a broad range of chemicals have been used or detected at the Air Liquide site including PCBs, arsenic, lead, calcium hydroxide, petroleum hydrocarbons, acetone, and chlorinated solvents (DEQ, 1995b).

Under DEQ oversight, work is underway to control observed infiltration of contaminated groundwater from the Rhone Poulenc site to the Metro and Air Liquide stormwater conveyance systems and to Basin 22B. Pesticides detected in the City sediment traps may represent contributions via these pathways.

City sediment trap data collected under this investigation confirm the presence of PCBs, pesticides, and metals sources in the upper portion of Basin 22B and support the need to evaluate offsite migration of contaminants from the Air Liquide and Metro sites.

Next Steps

Additional work is necessary to identify and control the sources of contamination in the upper portion of Basin 22B. The City understands that source control evaluations are pending for both the Air Liquide and Metro sites (Air Liquide's draft work plan has been submitted, and Metro's work plan is in progress). Robust evaluations of potential contaminant sources and pathways at these sites are needed to ensure that source controls are identified and implemented in advance of inriver cleanup. In addition, Rhone Poulenc has been coordinating with DEQ and the City on a work plan for lining the Outfall 22B conveyance system and most connecting laterals/systems. Once these sources are identified and controlled, the City will determine if further source investigation is warranted in the Basin 22B conveyance system.

References

- Anchor and Integral. 2008. Portland Harbor RI/FS Round 3A and 3B Stormwater Data Report. Prepared for the Lower Willamette Group by Anchor Environmental, L.L.C. and Integral Consulting Inc. September 2008.
- BES. 2007. City of Portland Outfalls Project, Winter 2008 Inline Sediment Trap Sampling and Analysis Plan. Letter to Karen Tarnow (DEQ) from Linda Scheffler (BES), December 20, 2007. City of Portland, Bureau of Environmental Services.
- DEQ. 1995a. DEQ Site Summary Report – Details for ECSI Site No. 1398. DEQ Environmental Cleanup Site Database (ECSI). Accessed June 2009; last apparent update February 1995. <http://www.deq.state.or.us/lq/ecsi/ecsidetail.asp?seqnbr=1398>
- DEQ. 1995b. DEQ Site Summary Report – Details for ECSI Site No. 395. DEQ Environmental Cleanup Site Database (ECSI). Accessed June 2009; last apparent update August 1995. <http://www.deq.state.or.us/lq/ecsi/ecsidetail.asp?seqnbr=395>
- DEQ/EPA. 2005. Portland Harbor Joint Source Control Strategy, Final, dated December 2005 (updated July 2007).

Tables

- Table 1 – *Summary of Chemical Analytical Results, Sediment Trap Solids Samples, Outfall Basin 22B*
- Table 2 – *Summary of PCB Congener Analytical Results, Sediment Trap Solids Samples, Outfall Basin 22B*

Figure

- Figure 1 – *Basin 22B - Sediment Trap Sampling Locations*

Attachments

- Attachment A – *Field Photographs*
- Attachment B – *Field Notes*
- Attachment C – *Laboratory Results*

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Tables

Table 1
Summary of Chemical Analytical Results
Sediment Trap Solids Samples
Outfall Basin 22B

		Upstream -----Downstream					
		City 2008 Sediment Trap Samples		LWG 2007 Sediment Trap Sample			
		ST1 Manhole AAM060 Downstream of Manhole in 24" line FO080754 6/9/2008	ST2 Manhole AAL961 Upstream of Manhole in 24" line FO080755 6/3/2008	Manhole AAJ650 Upstream of Manhole in 60" line LW3-STW-S10-OF22B 7/2/2007	JSCS ⁽¹⁾ Screening Level Value		
Class	Analyte	Units			Toxicity	Bioaccumulation	
Total Organic Carbon (EPA 9060 MOD)							
	TOC	mg/kg	246000	240000	73600	--	--
Total Solids (SM 2540 G)							
	TS	%	21.8	19.9	38.3	--	--
Metals (EPA 6020)							
	Aluminum	mg/kg	16200	425	NA	--	--
	Antimony	mg/kg	13.2	0.11	NA	64	--
	Arsenic	mg/kg	13.3	4.98	NA	33	7
	Cadmium	mg/kg	13.8	3.15	NA	4.98	1
	Chromium	mg/kg	207	2.36	NA	111	--
	Copper	mg/kg	316	6.8	NA	149	--
	Lead	mg/kg	651	68.4	NA	128	17
	Manganese	mg/kg	535	150	NA	1100	--
	Mercury	mg/kg	5.21	0.054	NA	1.06	0.07
	Nickel	mg/kg	91.8	11.8	NA	48.6	--
	Silver	mg/kg	2.17	0.1 U	NA	5	--
	Zinc	mg/kg	2290	960	NA	459	--
Organochlorine Pesticides (EPA 8081A)							
	4,4'-DDD	ug/Kg	180 P	130 P	NA	28	0.33
	4,4'-DDE	ug/Kg	48 P	39 P	NA	31.3	0.33
	4,4'-DDT	ug/Kg	110 U	120 U	NA	62.9	0.33
	Estimated Total DDT ⁽²⁾	ug/Kg	228	169	NA	--	0.33
	Aldrin	ug/Kg	19 P	13 U	NA	40	--
	alpha-BHC (α-BHC)	ug/Kg	8.9 JP	8.2 JP	NA	--	--
	beta-BHC (β-BHC)	ug/Kg	44 U	35 U	NA	--	--
	delta-BHC (δ-BHC)	ug/Kg	32 U	81 P	NA	--	--
	gamma-BHC (γ-BHC, Lindane)	ug/Kg	12 U	13 U	NA	4.99	--
	alpha-Chlordane ⁽³⁾	ug/Kg	150	94	NA	--	--
	beta-Chlordane ⁽³⁾	ug/Kg	230	110	NA	--	--
	Total Chlordane ⁽⁴⁾	ug/Kg	380	204	NA	17.6	0.37
	Dieldrin	ug/Kg	910	1200	NA	61.8	0.0081
	Endosulfan I	ug/Kg	14 U	13 U	NA	--	--

Table 1
Summary of Chemical Analytical Results
Sediment Trap Solids Samples
Outfall Basin 22B

			Upstream -----Downstream				
			City 2008 Sediment Trap Samples		LWG 2007 Sediment Trap Sample	JSCS ⁽¹⁾ Screening Level Value	
			ST1 Manhole AAM060 Downstream of Manhole in 24" line FO080754 6/9/2008	ST2 Manhole AAL961 Upstream of Manhole in 24" line FO080755 6/3/2008	Manhole AAJ650 Upstream of Manhole in 60" line LW3-STW-S10-OF22B 7/2/2007		
Class	Analyte	Units				Toxicity	Bioaccumulation
	Endosulfan II	ug/Kg	12 U	13 U	NA	--	--
	Endosulfan sulfate	ug/Kg	82 U	56 U	NA	--	--
	Endrin	ug/Kg	66	57	NA	207	--
	Endrin aldehyde	ug/Kg	12 U	13 U	NA	--	--
	Endrin ketone	ug/Kg	12 U	13 U	NA	--	--
	Heptachlor	ug/Kg	21 P	13 U	NA	10	--
	Heptachlor epoxide	ug/Kg	22	19	NA	16	--
	Methoxychlor	ug/Kg	35 U	35 U	NA	--	--
	Toxaphene	ug/Kg	800 U	830 U	NA	--	--

Notes:

J = This result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

P = The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides). WPCL reports these data as estimated.

U = The analyte was not detected above the reported method detection limit.

NA = Not analyzed.

-- No JSCS screening level available.

ug/kg = Micrograms per kilogram.

mg/kg = Milligrams per kilogram.

⁽¹⁾JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007).

⁽²⁾ Estimated Total DDT is the sum of DDE, DDD and DDT.

⁽³⁾ Alpha-chlordane is also known as cis-Chlordane. Beta-Chlordane is also known as trans-chlordane and gamma-chlordane.

⁽⁴⁾ Total Chlordane is sum of alpha-Chlordane and beta-Chlordane.

 = concentration exceeds JSCS Toxicity Screening Level Value

bold = concentration exceeds JSCS Bioaccumulation Screening Level Value

Table 2
Summary of Polychlorinated Biphenyl Congener Analytical Results
Sediment Trap Solids Samples
Outfall Basin 22B

IUPAC Number ⁽¹⁾ Chemical NameUnits			Upstream -----Downstream			JSCS ⁽²⁾ Screening Level Value	
			City 2008 Sediment Trap Samples		LWG 2007 Sediment Trap Sample		
			ST1 Manhole AAM060 Downstream of Manhole in 24" line FO080754	ST2 Manhole AAL961 Upstream of Manhole in 24" line FO080755	Manhole AAJ650 Upstream of Manhole in 60" line LW3-STW-S10-OF22B		
			6/9/2008	6/3/2008	7/2/2007		
Chlorinated Biphenyl Congeners (EPA 1668A)							
PCB 1	2-MoCB	ug/Kg	1.25	1.3	0.0767	--	--
PCB 2	3-MoCB	ug/Kg	0.632	0.612	0.0566 J	--	--
PCB 3	4-MoCB	ug/Kg	1.51	1.43	0.1	--	--
PCB 4	2,2'-DiCB	ug/Kg	13.1	12	NA	--	--
PCB 4/10			NA	NA	0.594		
PCB 5	2,3-DiCB	ug/Kg	0.63 EMPC	0.594	NA	--	--
PCB 5/8			NA	NA	3.26		
PCB 6	2,3'-DiCB	ug/Kg	9.86	8.96	0.641	--	--
PCB 7	2,4-DiCB	ug/Kg	2.09	1.84	NA	--	--
PCB 7/9			NA	NA	0.267		
PCB 8	2,4'-DiCB	ug/Kg	46.6	42.7	NA	--	--
PCB 9	2,5-DiCB	ug/Kg	3.11	2.89	NA	--	--
PCB 10	2,6-DiCB	ug/Kg	0.462	0.368	NA	--	--
PCB 11	3,3'-DiCB	ug/Kg	15.8	16	3.85	--	--
PCB 12/13	3,4-DiCB + 3,4'-DiCB	ug/Kg	2.81	3.17	0.246	--	--
PCB 14	3,5-DiCB	ug/Kg	0.0978 U	0.118 U	0.115 U	--	--
PCB 15	4,4'-DiCB	ug/Kg	13.6	14	1.66	--	--
PCB 16	2,2',3-TriCB	ug/Kg	19.9	20.8	NA	--	--
PCB 16/32			NA	NA	4.35		
PCB 17	2,2',4-TriCB	ug/Kg	23.2	23.9	2.63	--	--
PCB 18			NA	NA	6.7		
PCB 18/30	2,2',5-TriCB + 2,4,6-TriCB	ug/Kg	47.7	48.1	NA	--	--
PCB 19	2,2',6-TriCB	ug/Kg	4.78	5.11	0.503	--	--
PCB 20/28	2,3,3'-TriCB + 2,4,4'-TriCB	ug/Kg	57.4	63.1	NA	--	--
PCB 20/21/33			NA	NA	5.53		
PCB 21/33	2,3,4-TriCB + 2',3,4'-TriCB	ug/Kg	36.1	40.2	NA	--	--
PCB 22	2,3,4'-TriCB	ug/Kg	23.1	25	3.13 U	--	--
PCB 23	2,3,5-TriCB	ug/Kg	0.103	0.123	0.0573	--	--
PCB 24	2,3,6-TriCB	ug/Kg	0.0978 U	0.118 U	NA	--	--
PCB 24/27			NA	NA	0.462		
PCB 25	2,3',4-TriCB	ug/Kg	4.26	4.82	0.633	--	--
PCB 26			NA	NA	1.25		
PCB 26/29	2,3',5-TriCB + 2,4,5-TriCB	ug/Kg	10.5	12	NA	--	--
PCB 27	2,3',6-TriCB	ug/Kg	3.4	3.58	NA		
PCB 28			NA	NA	7.67		
PCB 29			NA	NA	0.136 UJ		
PCB 30			NA	NA	0.0573 U		
PCB 31	2,4',5-TriCB	ug/Kg	48.4	54.1	6.47	--	--
PCB 32	2,4',6-TriCB	ug/Kg	13.4	15.2	NA	--	--
PCB 34	2',3,5-TriCB	ug/Kg	0.204	0.23	0.0573 U	--	--
PCB 35	3,3',4-TriCB	ug/Kg	0.97	1.06	0.0573 U	--	--
PCB 36	3,3',5-TriCB	ug/Kg	0.543	0.483	0.0573 U	--	--
PCB 37	3,4,4'-TriCB	ug/Kg	11	11.8	2.46	--	--
PCB 38	3,4,5-TriCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 39	3,4',5-TriCB	ug/Kg	0.229	0.211	0.0573 U	--	--
PCB 40			NA	NA	1.31		
PCB 40/41/71	2,2',3,3'-TeCB + 2,2',3,4-TeCB + 2,3',4',6-TeCB	ug/Kg	27.2	27.3	NA	--	--
PCB 41/64/71/72			NA	NA	5.86		
PCB 42	2,2',3,4'-TeCB	ug/Kg	11.3	11.4	NA	--	--
PCB 42/59			NA	NA	2.35		
PCB 43	2,2',3,5-TeCB	ug/Kg	1.64	1.81	NA	--	--
PCB 43/49			NA	NA	5.09		
PCB 44			NA	NA	8.19		
PCB 44/47/65	2,2',3,5'-TeCB + 2,2',4,4'-TeCB + 2,3,5,6-TeCB	ug/Kg	37.2	37.9	NA	--	--
PCB 45			NA	NA	1.38		
PCB 45/51	2,2',3,6-TeCB + 2,2',4,6'-TeCB	ug/Kg	10.3	10.9	NA	--	--

IUPAC Number ⁽¹⁾ Chemical NameUnits			Upstream -----Downstream			JSCS ⁽²⁾ Screening Level Value	
			City 2008 Sediment Trap Samples		LWG 2007 Sediment Trap Sample		
			ST1 Manhole AAM060 Downstream of Manhole in 24" line FO080754	ST2 Manhole AAL961 Upstream of Manhole in 24" line FO080755	Manhole AAJ650 Upstream of Manhole in 60" line LW3-STW-S10-OF22B		
			6/9/2008	6/3/2008	7/2/2007	Toxicity	Bioaccumulation
Chlorinated Biphenyl Congeners (EPA 1668A)							
PCB 46	2,2',3,6'-TeCB	ug/Kg	3.43	3.64	0.608	--	--
PCB 47			NA	NA	1.77	--	--
PCB 48	2,2',4,5'-TeCB	ug/Kg	11.1	11.5	NA	--	--
PCB 48/75					1.57	--	--
PCB 49/69	2,2',4,5'-TeCB + 2,3',4,6'-TeCB	ug/Kg	24.6	25.3	NA	--	--
PCB 50			NA	NA	0.0281 J	--	--
PCB 50/53	2,2',4,6'-TeCB + 2,2',5,6'-TeCB	ug/Kg	6.95	7.38	NA	--	--
PCB 51			NA	NA	0.364	--	--
PCB 52	2,2',5,5'-TeCB	ug/Kg	44.3	45.5	NA	--	--
PCB 52/69			NA	NA	7.75	--	--
PCB 53			NA	NA	1.13	--	--
PCB 54	2,2',6,6'-TeCB	ug/Kg	0.113	0.118 U	0.0202 J	--	--
PCB 55	2,3,3',4'-TeCB	ug/Kg	0.0978 U	0.118 U	0.133	--	--
PCB 56	2,3,3',4'-TeCB	ug/Kg	8.35	8.18	NA	--	--
PCB 56/60			NA	NA	3.47	--	--
PCB 57	2,3,3',5'-TeCB	ug/Kg	0.913	0.202	0.0429 J	--	--
PCB 58	2,3,3',5'-TeCB	ug/Kg	0.0978 U	0.77	0.0573 U	--	--
PCB 59/62/75	2,3,3',6'-TeCB + 2,3,4,6'-TeCB + 2,4,4',6'-TeCB	ug/Kg	4.07	4.17	NA	--	--
PCB 60	2,3,4,4'-TeCB	ug/Kg	4.86	4.66	NA	--	--
PCB 61/70			NA	NA	7.36	--	--
PCB 61/70/74/76	2,3,4,5'-TeCB + 2,3',4',5'-TeCB + 2,4,4',5'-TeCB + 2',3,4,5'-TeCB	ug/Kg	40	40.8	NA	--	--
PCB 62					0.0573 U	--	--
PCB 63	2,3,4',5'-TeCB	ug/Kg	1	0.945	0.233	--	--
PCB 64	2,3,4',6'-TeCB	ug/Kg	18.5	18.3	NA	--	--
PCB 65			NA	NA	0.0573 U	--	--
PCB 66	2,3',4,4'-TeCB	ug/Kg	18.1	17.9	NA	--	--
PCB 66/76			NA	NA	4.98	--	--
PCB 67	2,3',4,5'-TeCB	ug/Kg	1.03	0.997	0.276	--	--
PCB 68	2,3',4,5'-TeCB	ug/Kg	0.106	0.118 U	0.0573 U	--	--
PCB 72	2,3',5,5'-TeCB	ug/Kg	0.18	0.168	NA	--	--
PCB 73	2,3',5',6'-TeCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 74			NA	NA	2.79	--	--
PCB 77	3,3',4,4'-TeCB	ug/Kg	1.87	2.04	0.623	--	0.052
PCB 78	3,3',4,5'-TeCB	ug/Kg	0.104 EMPC	0.142	0.0241 J	--	--
PCB 79	3,3',4,5'-TeCB	ug/Kg	0.612	0.613	0.0718	--	--
PCB 80	3,3',5,5'-TeCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 81	3,4,4',5'-TeCB	ug/Kg	0.0978 U	0.118 U	0.15	--	0.017
PCB 82	2,2',3,3',4'-PeCB	ug/Kg	5.16	4.91	1.58	--	--
PCB 83	2,2',3,3',5'-PeCB	ug/Kg	1.96	2.57	0.0573 U	--	--
PCB 84	2,2',3,3',6'-PeCB	ug/Kg	10.7	11.2	NA	--	--
PCB 84/92			NA	NA	3.94	--	--
PCB 85/116/117	2,2',3,4,4'-PeCB + 2,3,4,5,6'-PeCB + 2,3,4',5,6'-PeCB	ug/Kg	6.16	5.62	NA	--	--
PCB 85/116			NA	NA	1.44	--	--
PCB 86			NA	NA	0.0573 U	--	--
PCB 86/87/97/108/119/125	2,2',3,4,5'-PeCB + 2,2',3,4,5'-PeCB + 2,2',3',4,5'-PeCB + 2,3,3',4,5'-PeCB + 2,3',4,4',6'-PeCB + 2',3,4,5,6'-PeCB	ug/Kg	28	28.8	NA	--	--
PCB 87/117/125			NA	NA	3.75	--	--
PCB 88/91	2,2',3,4,6'-PeCB + 2,2',3,4',6'-PeCB	ug/Kg	6.09	6.04	1.23	--	--
PCB 89	2,2',3,4,6'-PeCB	ug/Kg	0.565	0.566	0.0988	--	--
PCB 90/101/113	2,2',3,4',5'-PeCB + 2,2',4,5,5'-PeCB + 2,3,3',5',6'-PeCB	ug/Kg	39.4	39.6	NA	--	--
PCB 90/101			NA	NA	9.41	--	--
PCB 92	2,2',3,5,5'-PeCB	ug/Kg	6.3	6.43	NA	--	--
PCB 93			NA	NA	0.0573 U	--	--
PCB 93/98/100/102	2,2',3,5,6'-PeCB + 2,2',3',4,6'-PeCB + 2,2',4,4',6'-PeCB + 2,2',4,5,6'-PeCB	ug/Kg	1.94	1.92	NA	--	--
PCB 94	2,2',3,5,6'-PeCB	ug/Kg	0.274	0.317	0.051 J	--	--
PCB 95	2,2',3,5',6'-PeCB	ug/Kg	33.1	33.1	NA	--	--
PCB 95/98/102			NA	NA	7.5	--	--
PCB 96	2,2',3,6,6'-PeCB	ug/Kg	0.482	0.48	0.0826	--	--
PCB 97			NA	NA	2.85	--	--
PCB 99	2,2',4,4',5'-PeCB	ug/Kg	18.5	18.1	3.72	--	--

IUPAC Number ⁽¹⁾ Chemical NameUnits			Upstream -----Downstream			JSCS ⁽²⁾ Screening Level Value	
			City 2008 Sediment Trap Samples		LWG 2007 Sediment Trap Sample		
			ST1 Manhole AAM060 Downstream of Manhole in 24" line FO080754	ST2 Manhole AAL961 Upstream of Manhole in 24" line FO080755	Manhole AAJ650 Upstream of Manhole in 60" line LW3-STW-S10-OF22B		
			6/9/2008	6/3/2008	7/2/2007	Toxicity	Bioaccumulation
Chlorinated Biphenyl Congeners (EPA 1668A)							
PCB 100			NA	NA	0.0232 J		
PCB 103	2,2',4,5',6-PeCB	ug/Kg	0.207	0.224	0.0867 UJ	--	--
PCB 104	2,2',4,6,6'-PeCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 105	2,3,3',4,4'-PeCB	ug/Kg	13.4	13.4	4	--	0.17
PCB 106	2,3,3',4,5-PeCB	ug/Kg	0.0978 U	0.118 U	NA	--	--
PCB 106/118			NA	NA	9.06		
PCB 107/124	2,3,3',4',5-PeCB + 2',3,4,5,5'-PeCB	ug/Kg	1.12	1.21	NA	--	--
PCB 107/109			NA	NA	0.557		
PCB 108/112			NA	NA	0.419		
PCB 109	2,3,3',4,6-PeCB	ug/Kg	1.86	1.89	NA	--	--
PCB 110			NA	NA	11.4		
PCB 110/115	2,3,3',4',6-PeCB + 2,3,4,4',6-PeCB	ug/Kg	45.9	45.8	NA	--	--
PCB 111	2,3,3',5,5'-PeCB	ug/Kg	0.399	0.118 U	NA	--	--
PCB 111/115			NA	NA	0.203		
PCB 112	2,3,3',5,6-PeCB	ug/Kg	0.0978 U	0.118 U	NA	--	--
PCB 113			NA	NA	0.0573 U		
PCB 114	2,3,4,4',5-PeCB	ug/Kg	0.723	0.768	0.201	--	0.17
PCB 118	2,3',4,4',5-PeCB	ug/Kg	29	30.3	NA	--	0.12
PCB 119			NA	NA	0.11		
PCB 120	2,3',4,5,5'-PeCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 121	2,3',4,5',6-PeCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 122	2',3,3',4,5-PeCB	ug/Kg	0.31 EMPC	0.364	0.139	--	--
PCB 123	2',3,4,4',5-PeCB	ug/Kg	0.443	0.53	0.184	--	0.21
PCB 124			NA	NA	0.442		
PCB 126	3,3',4,4',5-PeCB	ug/Kg	0.5	0.435	0.112	--	0.00005
PCB 127	3,3',4,5,5'-PeCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 128/166	2,2',3,3',4,4'-HxCB + 2,3,4,4',5,6-HxCB	ug/Kg	6.31	5.81	NA	--	--
PCB 128/162			NA	NA	1.9		
PCB 129			NA	NA	0.569		
PCB 129/138/163	2,2',3,3',4,5-HxCB + 2,2',3,4,4',5'-HxCB + 2,3,3',4',5,6-HxCB	ug/Kg	41.9	35.7	NA	--	--
PCB 130	2,2',3,3',4,5'-HxCB	ug/Kg	2.23	2.12	0.744	--	--
PCB 131	2,2',3,3',4,6-HxCB	ug/Kg	0.635	0.512	0.0573 U	--	--
PCB 132	2,2',3,3',4,6'-HxCB	ug/Kg	16	13.3	NA	--	--
PCB 132/161			NA	NA	3.17		
PCB 133	2,2',3,3',5,5'-HxCB	ug/Kg	0.459	0.339 EMPC	NA	--	--
PCB 133/142			NA	NA	0.301		
PCB 134/143	2,2',3,3',5,6-HxCB + 2,2',3,4,5,6'-HxCB	ug/Kg	2.1	1.81	0.586	--	--
PCB 135			NA	NA	1.33		
PCB 135/151	2,2',3,3',5,6'-HxCB + 2,2',3,5,5',6-HxCB	ug/Kg	15.9	12.2	NA	--	--
PCB 136	2,2',3,3',6,6'-HxCB	ug/Kg	6.73	5.44	1.35	--	--
PCB 137	2,2',3,4,4',5-HxCB	ug/Kg	2.16	2.53	0.574	--	--
PCB 138/163/164			NA	NA	10.6		
PCB 139/140	2,2',3,4,4',6-HxCB + 2,2',3,4,4',6'-HxCB	ug/Kg	0.704	0.669	NA	--	--
PCB 139/149			NA	NA	7.61		
PCB 140			NA	NA	0.0473 J		
PCB 141	2,2',3,4,5,5'-HxCB	ug/Kg	7.38	5.34	2.63	--	--
PCB 142	2,2',3,4,5,6-HxCB	ug/Kg	0.0978 U	0.118 U	NA	--	--
PCB 144	2,2',3,4,5',6-HxCB	ug/Kg	2.47	1.71	0.496	--	--
PCB 145	2,2',3,4,6,6'-HxCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 146	2,2',3,4',5,5'-HxCB	ug/Kg	4.87	4.09	NA	--	--
PCB 146/165			NA	NA	1.33		
PCB 147			NA	NA	0.167		
PCB 147/149	2,2',3,4',5,6-HxCB + 2,2',3,4',5',6-HxCB	ug/Kg	38.2	30.4	NA	--	--
PCB 148	2,2',3,4',5,6'-HxCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 150	2,2',3,4',6,6'-HxCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 151			NA	NA	2.39		
PCB 152	2,2',3,5,6,6'-HxCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--
PCB 153/168	2,2',4,4',5,5'-HxCB + 2,3',4,4',5',6-HxCB	ug/Kg	32.5	27	NA	--	--
PCB 153			NA	NA	10.6		
PCB 154	2,2',4,4',5,6'-HxCB	ug/Kg	0.356	0.29	0.086	--	--
PCB 155	2,2',4,4',6,6'-HxCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--

IUPAC Number ⁽¹⁾ Chemical NameUnits			Upstream		Downstream		JSCS ⁽²⁾ Screening Level Value	
			City 2008 Sediment Trap Samples		LWG 2007 Sediment Trap Sample			
			ST1 Manhole AAM060 Downstream of Manhole in 24" line FO080754	ST2 Manhole AAL961 Upstream of Manhole in 24" line FO080755	Manhole AAJ650 Upstream of Manhole in 60" line LW3-STW-S10-OF22B			
			6/9/2008	6/3/2008	7/2/2007	Toxicity		
Chlorinated Biphenyl Congeners (EPA 1668A)								
PCB 156			NA	NA	1.21			
PCB 156/157	2,3,3',4,4',5-HxCB + 2,3,3',4,4',5'-HxCB	ug/Kg	5.52	5.14	NA	--	--	
PCB 157			NA	NA	0.265			
PCB 158	2,3,3',4,4',6-HxCB	ug/Kg	3.81	3.42	NA	--	--	
PCB 158/160			NA	NA	1.26			
PCB 159	2,3,3',4,5,5'-HxCB	ug/Kg	0.44	0.347	0.122	--	--	
PCB 160	2,3,3',4,5,6-HxCB	ug/Kg	0.0978 U	0.118 U	NA	--	--	
PCB 161	2,3,3',4,5',6-HxCB	ug/Kg	0.0978 U	0.118 U	NA	--	--	
PCB 162	2,3,3',4',5,5'-HxCB	ug/Kg	0.324	0.246	NA	--	--	
PCB 164	2,3,3',4',5',6-HxCB	ug/Kg	2.3	1.7	NA	--	--	
PCB 165			0.0978 U	0.118 U	NA			
PCB 166	2,3,3',5,5',6-HxCB	ug/Kg	NA	NA	0.0573 U	--	--	
PCB 167	2,3',4,4',5,5'-HxCB	ug/Kg	1.3	1.33	0.465	--	0.21	
PCB 168			NA	NA	0.0573 U			
PCB 169	3,3',4,4',5,5'-HxCB	ug/Kg	0.0978 U	0.118 U	0.0499 U	--	0.00021	
PCB 170	2,2',3,3',4,4',5-HpCB	ug/Kg	7.66	7.29	3.14	--	--	
PCB 171			NA	NA	0.841			
PCB 171/173	2,2',3,3',4,4',6-HpCB + 2,2',3,3',4,5,6-HpCB	ug/Kg	2.78	2.4	NA	--	--	
PCB 172	2,2',3,3',4,5,5'-HpCB	ug/Kg	1.47	1.19	0.532	--	--	
PCB 173			NA	NA	0.0573 U			
PCB 174	2,2',3,3',4,5,6'-HpCB	ug/Kg	11.4	8.68	3.44	--	--	
PCB 175	2,2',3,3',4,5',6-HpCB	ug/Kg	0.577	0.478	0.0573 U	--	--	
PCB 176	2,2',3,3',4,6,6'-HpCB	ug/Kg	1.74	1.3	0.435	--	--	
PCB 177	2,2',3,3',4',5,6-HpCB	ug/Kg	5.01	4.09	2.2	--	--	
PCB 178	2,2',3,3',5,5',6-HpCB	ug/Kg	2.66	2.07	0.758	--	--	
PCB 179	2,2',3,3',5,6,6'-HpCB	ug/Kg	6.49	4.52	1.8	--	--	
PCB 180			NA	NA	8.42			
PCB 180/193	2,2',3,4,4',5,5'-HpCB + 2,3,3',4',5,5',6-HpCB	ug/Kg	21.1	18.8	NA	--	--	
PCB 181	2,2',3,4,4',5,6-HpCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--	
PCB 182	2,2',3,4,4',5,6'-HpCB	ug/Kg	0.0978 U	0.118 U	NA	--	--	
PCB 182/187			NA	NA	5.1			
PCB 183			NA	NA	2.23			
PCB 183/185	2,2',3,4,4',5',6-HpCB + 2,2',3,4,5,5',6-HpCB	ug/Kg	8.05	6.43	NA	--	--	
PCB 184	2,2',3,4,4',6,6'-HpCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--	
PCB 185			NA	NA	0.499			
PCB 186	2,2',3,4,5,6,6'-HpCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--	
PCB 187	2,2',3,4',5,5',6-HpCB	ug/Kg	17.3	13.9	NA	--	--	
PCB 188	2,2',3,4',5,6,6'-HpCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--	
PCB 189	2,3,3',4,4',5,5'-HpCB	ug/Kg	0.414	0.379	0.116	--	1.2	
PCB 190	2,3,3',4,4',5,6-HpCB	ug/Kg	1.58	1.48	0.601	--	--	
PCB 191	2,3,3',4,4',5',6-HpCB	ug/Kg	0.33	0.318	0.122	--	--	
PCB 192	2,3,3',4,5,5',6-HpCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--	
PCB 193			NA	NA	0.342			
PCB 194	2,2',3,3',4,4',5,5'-OxCB	ug/Kg	6.25	4.96	2.58	--	--	
PCB 195	2,2',3,3',4,4',5,6-OxCB	ug/Kg	2.49	1.98	1.03	--	--	
PCB 196	2,2',3,3',4,4',5,6'-OxCB	ug/Kg	4.94	3.97	NA	--	--	
PCB 196/203			NA	NA	2.98			
PCB 197			NA	NA	0.0891			
PCB 197/200	2,2',3,3',4,4',6,6'-OxCB + 2,2',3,3',4,5,6,6'-OxCB	ug/Kg	1.88	1.51	NA	--	--	
PCB 198			NA	NA	0.357			
PCB 198/199	2,2',3,3',4,5,5',6-OxCB + 2,2',3,3',4,5,5',6'-OxCB	ug/Kg	12	10	NA	--	--	
PCB 199			NA	NA	3.4			
PCB 200			NA	NA	0.377			
PCB 201	2,2',3,3',4,5',6,6'-OxCB	ug/Kg	1.76	1.29	0.448	--	--	
PCB 202	2,2',3,3',5,5',6,6'-OxCB	ug/Kg	2.15	1.73	0.774	--	--	
PCB 203	2,2',3,4,4',5,5',6-OxCB	ug/Kg	7.28	5.91	NA	--	--	
PCB 204	2,2',3,4,4',5,6,6'-OxCB	ug/Kg	0.0978 U	0.118 U	0.0573 U	--	--	
PCB 205	2,3,3',4,4',5,5',6-OxCB	ug/Kg	0.358 EMPC	0.293	0.0675	--	--	
PCB 206	2,2',3,3',4,4',5,5',6-NoCB	ug/Kg	6.11	5.55	3.3	--	--	
PCB 207	2,2',3,3',4,4',5,6,6'-NoCB	ug/Kg	0.801	0.726	0.336	--	--	
PCB 208	2,2',3,3',4,5,5',6,6'-NoCB	ug/Kg	2.13	1.85	0.958	--	--	
PCB 209	Decachlorobiphenyl	ug/Kg	4.82	4.09	1.44	--	--	

IUPAC Number ⁽¹⁾	Chemical Name	Units	Upstream -----Downstream			JSCS ⁽²⁾ Screening Level Value	
			City 2008 Sediment Trap Samples		LWG 2007 Sediment Trap Sample		
			ST1 Manhole AAM060 Downstream of Manhole in 24" line FO080754	ST2 Manhole AAL961 Upstream of Manhole in 24" line FO080755	Manhole AAJ650 Upstream of Manhole in 60" line LW3-STW-S10-OF22B		
			6/9/2008	6/3/2008	7/2/2007	Toxicity	Bioaccumulation
Chlorinated Biphenyl Congeners (EPA 1668A)							
	Total Monochlorobiphenyls	ug/Kg	3.38	3.35	0.233	--	--
	Total Dichlorobiphenyls	ug/Kg	107	102	10.5	--	--
	Total Trichlorobiphenyls	ug/Kg	305	330	41.8	--	--
	Total Tetrachlorobiphenyls	ug/Kg	278	282	57.6	--	--
	Total Pentachlorobiphenyls	ug/Kg	252	255	62.3	--	--
	Total Hexachlorobiphenyls	ug/Kg	195	161	49.8	--	--
	Total Heptachlorobiphenyls	ug/Kg	88.5	73.3	30.6	--	--
	Total Octachlorobiphenyls	ug/Kg	38.7	31.6	12.1	--	--
	Total Nonachlorobiphenyls	ug/Kg	9.05	8.13	4.59	--	--
	Total Decachlorobiphenyls	ug/Kg	4.82	4.09	1.44	--	--
	Total PCBs	ug/Kg	1280	1250	271	676	0.39

Notes:

MoCB = Monochlorobiphenyl

DiCB = Dichlorobiphenyl

TriCB = Trichlorobiphenyl

TeCB = Tetrachlorobiphenyl

PeCB = Pentachlorobiphenyl

HeCB = Hexachlorobiphenyl

HpCB = Heptachlorobiphenyl

OcCB = Octachlorobiphenyl

NoCB = Nonachlorobiphenyl

U = The analyte was not detected above the reported method detection limit.

EMPC = Estimated maximum possible concentration.

-- No JSCS screening level available.

ug/Kg = Micrograms per kilogram.

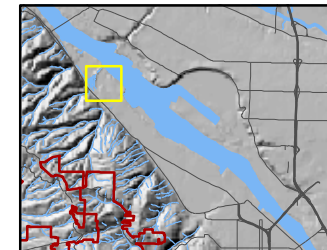
⁽¹⁾IUPAC - International Union of Pure and Applied Chemistry

⁽²⁾JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Final December 2005, Amended July 2007).

bold = concentration exceeds JSCS Bioaccumulation Screening Level Value

NA = Not analyzed

Figure



Legend

- T Storm Inlets
- Storm Pipe
- (Manhole
- Taxlots
- 22B Basin Boundary
- ^ DEQ/EPA Environmental Cleanup Site
- O Industrial Stormwater Permits
- City Sample Point
- LWG Sample Point

0 100 200 400 Feet

Figure 1
Basin 22B
Sediment Trap Sampling
Locations

Source: City of Portland BES
 Aerial photo 2008

ENVIRONMENTAL SERVICES
 CITY OF PORTLAND
 1120 SW Fifth Avenue, Room 1000
 Portland, Oregon, 97204-3912

File Name:
 s:\gis\outfalls\outfalls_22b\
 of22b_071509.mxd

Program Manager:
Linda Scheffler
Portland Harbor Superfund

Sheet No:
 1 OF 1

Date Printed:
 07/15/2009
 Prepared by:
 Sara Gardner

Attachment A

Field Photographs



Photo 1 (December 13, 2007). Sample location ST1 (Manhole AAM060). Traffic control and tripod setup during installation of sediment traps.



Photo 2 (May 28, 2008). Sediment trap bottles in 24-in-diameter line just downstream from manhole AAM060, sampling location ST1.



Photo 3 (December 13, 2007). Sample location ST2 (Manhole AAL961). Traffic control and tripod setup during installation of sediment traps.



Photo 4 (December 13, 2007). View of sediment traps installed in 24-inch-diameter line just upstream of manhole AAL961, sample location ST2.



Photo 5 (May 30, 2008). Filtered sediment from sample location ST1.



Photo 6 (June 30, 2008). Filtered sediment sample from location ST2, with visible indications of high organic content.

Attachment B

Field Notes



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

Field Operations
6543 N. Burlington Ave.
Portland, OR 97203-5452



INLINE SEDIMENT TRAP FIELD DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP	Project No.: 1020.005	Date: 12/13/07	By: MJS, AJA
Site Address: 6529 NW Front Ave, approx 200' NE of NW 61st JXB - O.S. IN 24" LINE	Pt Code: 22B-ST1	Basin: 22B	Hansen ID: AAM060

SECTION 1 - INSTALLATION INFORMATION

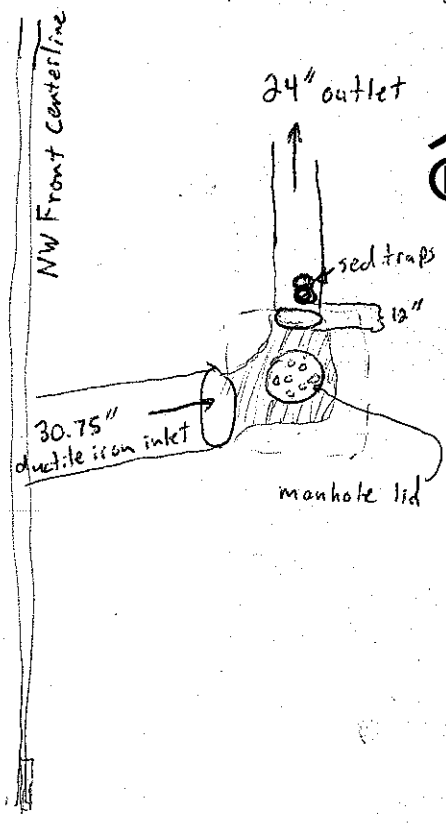
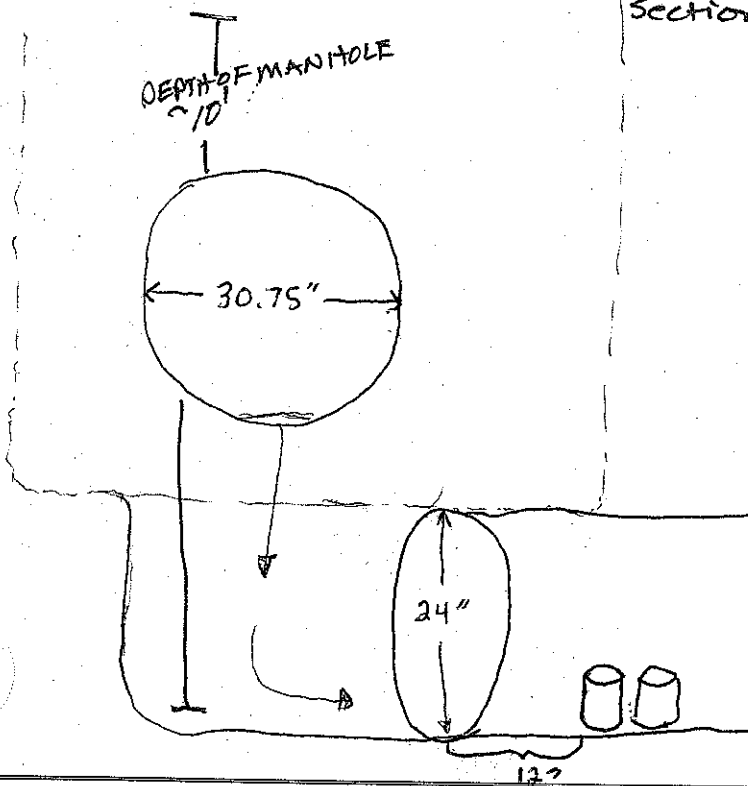
Traffic control and/or site access concerns: Site requires eastern half of NW Front to be closed. Direct the Northbound traffic around site and restrict the southbound traffic to the western half of their lane	Describe flow conditions and depth and/or any standing water at time of install (does river appear to back up into this line intermittently?): currently 2" of base flow in pipe w/ ~ ? no evidence of river back-up
--	--

Describe sediments in pipe if present (depth, sampleable quantities, lateral extent, etc.): ~ 1/4" of bio-film and very fine black colored sed.	Sed trap bottles installed on: 12/13/07
Sediment trap location(s) (pipe size, distance from center of node, proximity to laterals, etc.): Sed. traps installed 4' down stream of manhole, 1' down stream into the invert of 24" outlet pipe	Pipe diameter (inches): 24" Distance from MH node (feet): 12'

SED TRAP SITE DIAGRAM

(Sketch map of the lateral(s) and layout of manhole, showing approx sed. trap location, manhole elevation and inline sediment if present. Orient drawing using the top of the page as north):

JXB - AAM060 Cross-Section





CITY OF PORTLAND
ENVIRONMENTAL SERVICES

Field Operations
6543 N. Burlington Ave
Portland, OR 97203-5452



INLINE SEDIMENT TRAP FIELD DATA SHEET

Project Name: PORTLAND HARBOR STORMWATER SAMP	Project No.: 1020.005	Date: 12/13/07	By: MJS/AJA
Site Address: 6529 NW FRONT AVE ^{51B} - US in 24" line (~400' NW of NW 61 Ave)	Pt Code: 22B-ST2	Basin: 22B	Hansen ID: AAL961

SECTION 1 - INSTALLATION INFORMATION

Traffic control and/or site access concerns:
M.H. is located in the middle of the street so a cone island around the truck & M.H. is sufficient. Right Arrows (→) on each front cone help to avoid driver confusion.

Describe flow conditions and depth and/or any standing water at time of install (does river appear to back up into this line intermittently?):

Base flow was present @ a depth of 1.0 inch (~0.3-0.5 cfs). The preceeding week had no rainfall. The river does not appear to back up to site.

Describe sediments in pipe if present (depth, sampleable quantities, lateral extent, etc.):

Very fine layer of silty sediment present w/ biofilm - bacterial mat

Sed trap bottles installed on:

12/13/07

Sediment trap location(s) (pipe size, distance from center of node, proximity to laterals, etc.):

Sed traps installed ~1.5 ft upstream of 24" pipe opening.

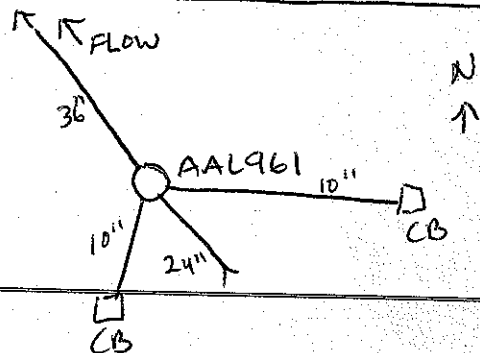
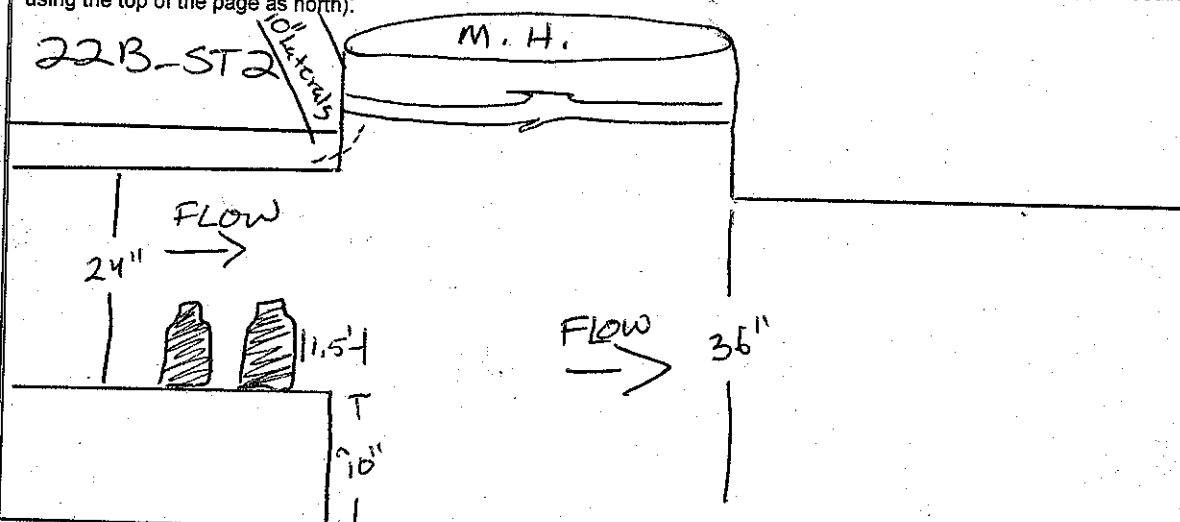
Pipe diameter (inches) 24"

Installed in line w/ one another. Nearest laterals are two 10" pipes coming into the vault immediately downstream & above the 24" pipe. Noted that 24" pipe inlet is ~10" above M.H. invert & is flush w/ vault side wall. Outlet pipe is ~36" & is @ the same elevation as the M.H. invert.

Distance from MH node (feet) 1.5' upstream

SEDIMENT TRAP SITE DIAGRAM

(Sketch map of the lateral(s) and layout of manhole, showing approx sed. trap location, manhole elevation and inline sediment if present. Orient drawing using the top of the page as north):





Page 1 of 3

PORTLAND HARBOR STORMWATER SAMP.

Project Inline Sed Trap installs

Location Basin 22B

Subject SEDIMENT TRAP INSTALLATIONS JXB

Project No. 1020.005

Date 12/13/07

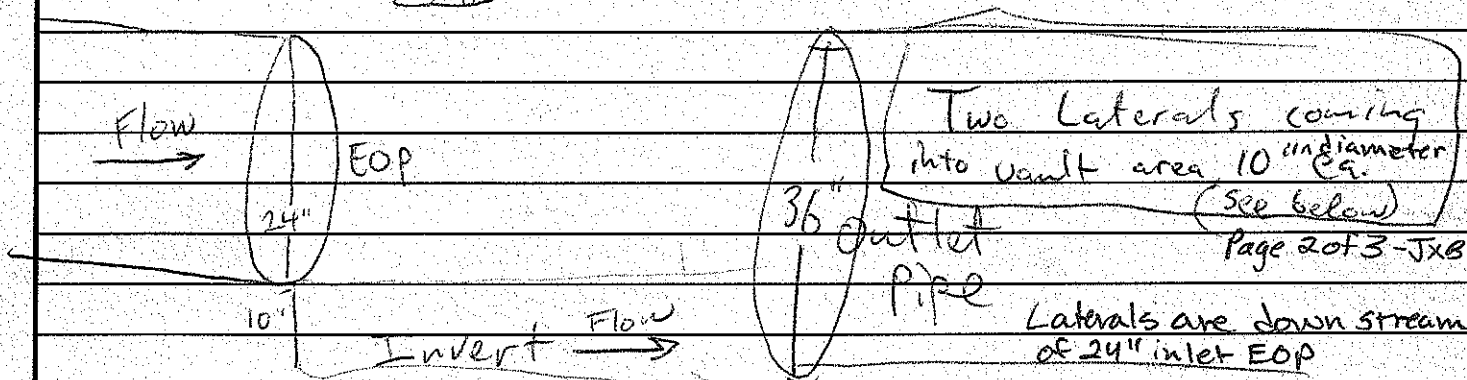
By ATA/MJS

1105 on site at node AAL 961, basin 22B
on NW Front ave at ~G2nd to install Sed Traps @ JXB
22B-ST2

From the topside, target pipe drops off into
invert with approx 9-12" drop. Base flow is
substantial, maybe 0.3-0.5 cfs.

Confirmed with Pete and Linda that u/s is
the preferred trap placement. Placement chosen
to isolate samples from other laterals flowing
into invert.

Target pipe confirmed at 24"
Drop from target EOP 10" to bottom of
invert at (44) in MH Vault Target
EOP is flush with invert wall JXB
~~CMH~~



SE Lateral is HDPE SW Lateral is Concrete

Attachments



Page 2 of 3

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

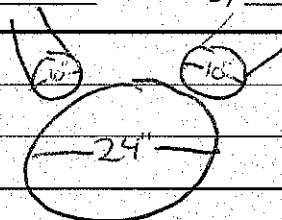
Location BASIN 22B

Date 12/13/07 JXB

Subject Sed trap installs

By MJS/AJA

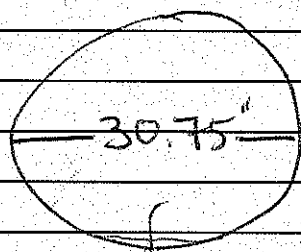
Looking up pipe at
10" laterals. Laterals
Coming from catch
basins.



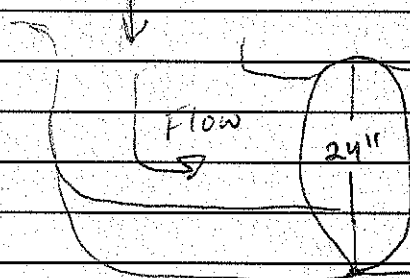
1" of baseflow in pipe. There is a mat of
biofilm under the baseflow-wetted areas. There is
some very fine sediment intertwined with this
biofilm mat. Lots of snails everywhere.

6 Photo taken → 2 up top
2 before install
2 after install

1315 on site at node AAM060 to install
Sed Traps @ 22B-ST1



Flow comes from the west,
falls into invert into 24"
line flowing North.



Confined pipe size → outlet
is 24" concrete
inlet pipe
is 30.75"
steel.

Attachments

1.5" of baseflow, no real sediment accumulation



Page 3 of 3

Project ^{JAB} PORTLAND HARBOR STORMWATER SAMP.
Location BASIN 22B
Subject Sed trap installs

Project No. 1020.005
Date 12/13/07
By MJS/ASA

Same type of biofilm and snails as found
at previous install (AAL 961)

Traps were installed about 1 foot
down the line.

Attachments



Page 3 of 5

Project Portland Harbor Stormwater Mon
Location OF 16, 19, 22B
Subject Monthly In-Line Sed Trap Checks

Project No. 1020.005
Date 1/9/08
By RCB/JXB

All times PST

1200: Arrive @ 6529 NW Front, OF 22B-ST2. Setup TC. JXB to enter. Elevated 1#1 entering through MH seams and lateral. Upstream bottle covered w/ organic debris and ~ 3/4" of sludgy sediment, ^{along trap housing} which was removed. ~~Downstream~~ ^{RCB} ~~bot~~ This bottle is full of stormwater. Downstream bottle full of stormwater - no debris covering mouth. Organic particles floating on surface of water in each bottle. Two photos taken of sed traps/bottles in-situ. Approx. 2" of base flow in pipe. Measured elevated pipe for potential installation of a flow restricting weir. Weir length cannot ~~not~~ exceed 28" to fit in MH. Capped bottles and removed them for inspection.

1224: Upstream 22B-ST2-B1 photographed. Approx 0.2" (2% by volume) of sediment in bottle.

1227: Downstream 22B-ST2-B2 photographed. Approx 0.5" (5% by volume) of sediment in bottle.

Good sediment accumulation for both traps. Flow restricting weir most likely not needed at this location. Bottles placed back in sed traps and caps removed.

1240: Off-site.

1249: Arrive @ 22B-ST1, approx. 200 yards SW of previous location. Setup TC. JXB to enter. Approx 1.6" of flow entering MH from elevated lateral to the south. Both sed trap bottles free of debris over bottle mouth. Plastic debris on housing of downstream trap. Leaf stuck on side of downstream bottle.

Attachments

Continued →



Page 4 of 5

Project Portland Harbor Stormwater Mon
Location OF 16, 19, 22B
Subject Monthly In-Line Sed Trap Checks

Project No. 1020.005
Date 1/9/08
By RCB/JXB

22B-ST1 continued...

Bottles capped and removed. No sheen on either bottle. Both bottles full of stormwater and both exhibit a slight sulfurous or PAH odor and are slightly turbid and light gray in color.

1315: ~~Bottle~~ Bottle 22B-ST1-B2 photographed. Approx. 0.75" of ^{Downstream} sediment in bottle (~7% by volume), though sediment was not completely out of suspension. Also, there are trace amounts of sediment visible on interior bottle walls.

1317: Bottle 22B-ST1-B1 photographed. Approx. 1" of ^{Upstream} sediment in bottle (~10% by volume), though sediment was not completely out of suspension. Also trace amounts of sediment visible on interior bottle walls. Bottles placed back in traps. Caps removed.

1333 Off site

1356 - Arrive on site @ 19-ST1 (4927 NW Front Ave.). RCB enters private Calbag node. No debris (plastic or organic) accumulated around sed trap housing. However, RCB notes presence of broken piece of 2x2 wood w/ nail wedged against downstream sed trap housing.

Took photo of sed. traps w/ 2x2 wood debris in-situ.

Little-to-no flow in pipe. Capped & removed sed trap bottles for inspection.

Continued →



Page 4 of 5

Project Portland Harbor Stormwater Sump

Project No. 1020.005

Location ^{JXB} ST2 + ST1 OF22B-ST2

Date 2/13/08

Subject ^{MONTHLY} OF22B IN LINE SED TRAP CHECKS

By PCB/JXB

1052: Arrive at OF22B-ST2. Set up TC

1101: JXB enters pmt. Downstream sed trap has organic & plastic debris around housing, but not on bottle. Upstream bottle housing is covered w/ organic sludge, as is the bottle side walls just below the bottle neck. Leaf stuck to bottle neck, but does not impact bottle opening. Base flow is 4.5" @ 2.0 fps. JXB clears debris from upstream bottle neck. Sludge extends as far as can be seen upstream.

1109: PCB rinses bottle caps, send them down to JXB. JXB caps bottles using clean gloves. Bottle 2 is downstream, Bottle 1 is upstream. JXB cleans outside of bottles w/ paper towels, then takes sediment accumulation measurements.

NO storm water
PCB
Bottle 1: 1.1" of sediment w/ abundant sediment on bottle inside wall. Sediment is not compacted. Bottle is ~95% full of stormwater. Large particle of sediment visible in bottle neck.
Bottle 2: 0.8" of sediment w/ abundant sediment on bottle inside wall. Sediment is not compacted. Bottle is completely full of stormwater. Small organic particles floating in stormwater.

1124: JXB places bottles back into housing, secures them, and removes caps using clean gloves.

1127: Off-site.



Page 5 of 5

Project Portland Harbor Stormwater Sump

Project No. 1020.005

Location OF22B-ST1

Date 2/13/08

Subject In Line Sed Trap Check

By JXB/PCB

1131: Arrive @ 22B-ST1 and set up TC.

1150: JXB enters site, observes both bottles full of stormwater. Base flow is 2.1" @ 1.0 Gps. Base plates are covered w/ a thin layer of sludge, but sed trap housing is otherwise free of debris. Small organic particles observed on surface of stormwater in bottles. JXB dons clean gloves and ~~removes~~ PCB places caps on bottles, then removes them for inspection.

1202 Bottle 1 was upstream. Sediment depth in bottle is 1.7" w/ abundant sediment adhered to sidewalls inside bottle. Sediment in bottle was not compacted w/ some visibly in suspension. No sheen on stormwater in bottle, but appears to have a small piece of plastic floating on surface.

Bottle 2 was downstream. Sediment depth in bottle is 1.4" w/ abundant sediment adhered to sidewalls inside bottle. Sediment in bottle was not compacted w/ some visibly in suspension. No sheen on stormwater.

Bottles placed back in sed traps, JXB dons clean gloves. Caps removed, JXB exits MH.

1220 Offsite.



Page 1 of 2

Project Portland Harbor Stormwater
Location OF 22B
Subject ^{JXB} Monthly Sed Trap Checks

Project No. 1020.005
Date 3-19-08
By LAP, JIM

Times in PST

1055: Arrive OF22B ST2 (6529 NW Front Ave).

1059: Entrant notes: 1.5" baseflow

Approx. 0.1" depth biofilm & fine
seeds on sediment trap housing &
in-line. Organic debris is caught on

(upstream
bottle) trap housing & is causing a backup
behind accumulated debris ($\approx 2\frac{1}{2}$ " depth).

photo documented [Upstream bottle (B1) had organic
debris covering $\approx 25\%$ of bottle opening.
Entrant carefully removed debris in such
a manner as to ensure no debris getting
in sample bottle. B1 had ≈ 1.1 "
accumulated sediment & is full of
turbid stormwater. B1 had an organic
smell to it; a sheen was present also.

Downstream bottle (B2) had approx 0.6"
accumulated sediment & was full of
turbid stormwater. B2 had an organic
(wetland-muck-like) smell to it; a
sheen was observed.

1126: Depart OF22B ST2; Routine check.

Attachments



Page 2 of 2

Project Portland Harbor Stormwater
Location OF 22 B
Subject SAB monthly Sed Trap Checks

Project No. 1020.005
Date 3-19-08
By LAP, JJM

1131: Arrive @ OF 22B-ST1 (6529 NW Front Ave).

1134: In-trant notes 2.5" baseflow (≈ 2 ft/sec)
& some biofilm on bottles & pipe ^{base @ 22B-ST2} ~~other~~ ^{Jr3}
wise no organic debris or sediments
observed.

Bottle B1 (upstream) had approx. 2.3" accumulated sediment and is full of turbid stormwater. B1 had an organic (wetland/muck like) smell to it & a sheen was observed.

Bottle B2 (downstream) had approx. 1.8" accumulated sediment & was full of turbid stormwater. B2 had an organic (wetland/muck like) smell to it & a sheen was observed.

1151: Depart OF 22B-ST1. Routine check.

* Potential to remove bottle(s) due to depth of accumulated sediments on the next round of sed. trap checks.



Page 1 of 2

Project Portland Harbor Stormwater Samp.

Project No. 1020.005

Location NWPD

Date 3/31/08

Subject sed. trap bottle swaps 16-ST2, 22B-ST2

By JTM, MTS

0909 PST Arrive @ 16-ST2 to swap bottles due to net loss of sed. accumulation from 2/13/08 - 3/19/08. Entrant confirms bottle necks and opening are free and clear of debris. Entrant capped and removed bottles B1 : B2.

- B1 bottle is full with moderately turbid stormwater. Sed. depth is 0.25" which is the same depth recorded 3/19/08. Trace fine sediment and biological growth adhering to inner bottle surfaces. No noticeable odor.
- B2 bottle sed. depth ~ 0.4". All other descriptions and characteristics the same as noted for B1

Entrant secured B3 downstream and B4 upstream in traps and placed caps in labeled bag.

B1 : B2 were photographed adjacent to sample description board and archived in double bagged storage in staging area cooler.

0942 PST Departed site.

1001 PST Arrive @ 22B-ST2 to swap bottles due to loss of sediment from 2/13/08 - 3/19/08. Entrant notes bottle necks and openings are free of debris. Entrant also notes a debris dam of organic material accumulated on/around traps damming US flow. Entrant capped and removed B1 : B2

- B1 bottle is full with turbid stormwater. Sed. depth is 1.3". Trace fine sed. : organic/biological growth adhering to inner bottle surfaces. Bottle has an organic smell/odor.
- B2 bottle also full w/ turbid stormwater. Sed. depth 0.75". Bottle description and characteristics same as noted for B1

Entrant secured B3 B4 according to labeling on bottles by JXB. Caps placed in bag labeled 22B-ST2 B3: B4.

Attachments



Page 2 of 2

Project Portland Harbor Stormwater Samp.
Location NWPDY
Subject sed. trap bottle swaps

Project No. 1020.005
Date 3/31/08
By WM, MJS

22B-STZ

Bottles B1 & B2 were photographed adjacent to sample description board and archived in double zip bagged storage in NPCL Staging area cooler.

1040 Departed site.

Attachments



Page 1 of 4

Project PORTLAND HARBOR STORMWATER MON.

Project No. 1020.005

Location BASINS 22B, 16 & 19

Date 4/16/08

Subject MONTHLY INLINE SED. TRAP CHECKS

By JXB/JJM

Background Weather Discussion: Scattered showers during the last 48 hours. Current weather - overcast w/ intermittent showers.

0820 PST - Left WPCL for Basin 22B

^{JXB} ~~Back~~ Background:

0838 - Arrive @ 22B-ST2. Sed trap bottles @ this site were removed & archived ^{JXB} last month due to net loss of sed. accumulation between ~~3~~ 2/13/08 - 3/19/08. Entrant notes partial debris dam around/on sed trap housings & bottle necks. Debris is partially damming flow upstream (US) of traps. Entrant notes organic debris partially covering US sed. trap bottle mouth. Entrant carefully removed debris. Two photos of organic debris/partial dam taken by entrant @ EOP & sed traps in-situ. Entrant capped & removed bottles B3 & B4.

- Upstream bottle (B4) had approx. 0.35" (<4% by volume) of accumulated sed. Bottle is full of turbid stormwater.
- Downstream bottle (B3) had approx. 0.3" (<3% by volume) of accumulated sed. All other descriptions & characteristics for B3 are the same as noted for B4.

Sed. Trap bottles B4 & B3:

Trace fine sed. & biological growth adhering to inner bottle surfaces. Sheen on surface of captured stormwater within sed. trap bottles; decomposing organic odor present.

Entrant secured sed. trap bottles and removed caps.

0907 - Left 22B-ST2 for 22B-ST1.

Attachments

JXB
4/16/08

NOTE: The determination to remove & archive sed. trap bottles from 22B-ST1 was also based on sed accumulation & stormwater capture during the last month @ the downstream 22B-ST2 site following last month's bottle swap.



Page 2 of 4

Project PORTLAND HARBOR STORMWATER MON.

Project No. 1020.005

Location BASINS 22B, 16 & 19

Date 4/16/08

Subject MONTHLY INLINE SED. TRAP CHECKS

By JXB/JJM

0924 PST - Arrive @ 22B-ST1, after setting up TC, to perform monthly inline sed. trap inspection. Entrant notes build up of iron ^{JXB} ~~per~~ precipitate around US side of sed. trap housing. Entrant confirms that bottle necks and mouths are free & clear of debris. Entrant capped & removed bottles B1 & B2.

- Upstream bottle (B1) had approx. 2.8"-3.2" ($\leq 32\%$ by volume) of accumulated sediment. Trace fine sed. & organic/biological growth adhering to inner bottle surface. Bottle is full of turbid stormwater w/ no odor or noticeable sheen.
- Downstream bottle (B2) had between 2.0"-2.5" ($< 25\%$ by volume) of accumulated sed. All other descriptions & characteristics the same as noted for B1.

0955 - Due to the large quantity of accumulated sed. captured @ this site over the last month; the determination was made by the field crew to remove the sed. trap bottles, ^{JXB} ~~to be~~ archived until the completion of this Project's deployment period. Sed. trap bottles were archived according to Field Operations SOP 5.01b.

Two photos were taken of archived sed. trap bottles. Entrant secured two new sed. trap bottles. Bottles were ^{JXB} ~~labeled~~ labeled as 22B-ST1-B3 UPSTREAM & 22B-ST1-B4 DOWNSTREAM. Entrant removed bottle caps & placed them into pre-labeled bag (22B-ST1 B3 & B4).

1011 - Left Basin 22B for Basin 19.

Attachments



Page 1 of 3

Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location BASINS 19, 22B & 16

Date 5/28/08

Subject SEDIMENT TRAP REMOVALS

By JXB/DJH

BACKGROUND: Current weather - overcast w/ slight chance of showers ^{called} for later today, while conducting sed. trap removals in Basins 19, 22B & 16. End of wet weather deployment period. Last measurable precip was < 72 hours ago.

19-ST1 - 0815PST On site for last monthly check & to remove & archive sed. traps. Sediment trap bottles & housing are free of debris & obstructions. Entrant secured bottle caps & removed bottles from traps to conduct visual observations, photo documentation, & archive samples for subsequent processing.

0835- Little-to-no change in sed. accumulation @ 19-ST1 since last month's check. Both sed. trap bottles are full of slightly turbid stormwater w/a stagnant, decomposing odor. NO observable sheen present.

Upstream bottle (B2) - Had approx. $\leq 0.6"$ of sed. captured.
Downstream bottle (B1) - Had approx $\leq 0.3"$ of sed. captured.

0845- Left 19-ST1 for Basin 22B after removing sed. trap housing.

22B-ST2 - 0855 Arrived on site. Entrant noted organic debris adhered to upstream sides of sed. trap housing w/a small piece of plastic partially covering upstream sed. trap bottle mouth (obstructed approx. 15%).

Attachments



3/24/08
Page 2 of 3

Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location BASINS 19, 22B & 16

Date 5/23/08

Subject SEDIMENT TRAP REMOVALS

By JXB/DJT

22B-ST2 - 0855 PST (cont.) Entrant notes organic biofilm around sed. trap housing and upstream, along invert of pipe. Both sediment trap bottles are full of slightly turbid stormwater. Captured stormwater has no observable sheen, but the downstream bottle has small plastic type particulates^{floating} on surface of captured stormwater. Noticeable stagnant, decomposing odor present. Entrant carefully removed plastic piece covering upstream bottle.

Entrant secured bottle caps on sed. trap bottles & removed bottles. Performed visual observations of sed. accumulation, photo documentation & archived sed traps for subsequent processing.

Upstream bottle (B4) - Approx. < 0.6" of accumulated sed.

Downstream bottle (B3) - Approx. < 0.6" of accumulated sed.

0931 - Removed sed trap housing & left to 22B-ST1.

22B-ST1 - 0943 Sed. traps are free of organic debris & sed trap bottle mouths are free of obstructions. Trace amount of organic biofilm on sed. trap housing. Both sed. trap bottles are full of slightly turbid stormwater. No discernable ~~odor~~ ^{sheen}, stagnant, decomposing odor present.

JXB bottles

0950 - Entrant capped sed. trap bottles securely & removed^{for} visual observation, photo documentation, and archived samples for processing. Removed sed. trap housing.

Upstream Bottle (B3) - Had approx. ^{0.5"} ~~2 6.6"~~ of accumulated sed.

Downstream Bottle (B4) - Had approx. < 0.7" of accumulated sed.

Attachments

1015 - Left Basin 22B for Basin 16.

Matrix: SEDIMENT

Requested Analyses

Outfall 22B Sediment Traps

Sediment traps installed: 12/13/07; removed: 5/28/08

Total Solids to be done at WPC_L, care should be taken to use the smallest aliquot possible to retain sample volume for additional follow-up analyses.

[illegible]

*Strong chemical odor open in head

Comments

Relinquished By: 1	1405	Relinquished By: 2	Relinquished By: 3	Relinquished By: 4
--------------------	------	--------------------	--------------------	--------------------

[illegible]

Received By:	1.	2.	3.	4.
Received By:	1.	2.	3.	4.

	Signature:
Time: 1:05	Time:
	Signature:
Time:	Time:
	Signature:
Time:	Time:

	Printed Name:	MENIS
	Date:	6/9/08
	Printed Name:	KATS MENIS
	Date:	UAE 6/9/08

S:\EID\1000\1020.005 - Portland Harbor Stormwater Sample\FY 2007_2008 Sediment Trap Sampling\Portland Harbor Of Sed Trap Completed COC (FY 2007-08).xls



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory
6543 N. Burlington Ave
Portland, OR 97203-5452



INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: **PORTLAND HARBOR STORMWATER SAMP**

Project Number: **1020.005**

Sample Processing Conducted By:

JXB

Sample Pt. Code:

22B-ST1

Removal Date:

4/16/08

Processing Date:

JXB
5/30/08 **6/9/08**

Basin: **22B**

Hansen ID: **AA-M060**

Subbasin: **N/A**

Sediment Trap Location Description/Address: **6529 NW Front Ave. / Sed. traps were installed downstream of manhole AA-M060 - approx. 1' downstream from the end of pipe (EOP) along the invert in the 24" outlet pipe.**

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method:

Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system [Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration Equipment for Phthalates Technical Memorandum - September 18, 2007].

Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper):

Fischer Scientific, qualitative cellulose filter paper - P2 1-5 µm P8 20-25 µm

Sediment Trap Bottle ID: **22B-ST1-B1-**

Sediment Trap Bottle ID: **22B-ST2-B2-**

Total Est. Depth of Accumulated Sed in Bottle (inches): **~2.8"**

Total Est. Depth of Accumulated Sed in Bottle (inches): **~2.0"**

Sample Processing Start Time:

0950 PST

Sample Processing End Time:

1200 PST

Sample Processing Start Time:

1200 PST

Sample Processing End Time:

1229 PST

Number of Filters Used: **2x P2 1-5 µm 3x P8 20-25 µm**

Number of Filters Used: **3x P8 20-25 µm**

Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):

N/A

Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL):

N/A

Tare Weight [empty jar in grams (g)]:

N/A

Tare Weight [jar and filtered sed. from Bottle 1 in grams (g)]:

N/A

Dewatered/Filtered Sed. Weight (g): **SEE NOTES**

Dewatered/Filtered Sed. Weight (g): **SEE NOTES**

Non-existent flow-through rates & continued clogging. Sample Processing Notes/Comments: one hindering filtration process. As a result, deviated from filtering process SOP 5.01b. Poured off ~350 mL (~35% of sample bottle) through filtration assembly. Remaining sample was poured off into a 1x gallon glass stormwater composite jar. High organic content & clogging filters. Black organic sludge w/oily sheen & strong decomposing organic odor present.

Sample Processing Notes/Comments: Poured off ~550 mL of supernatant (~55% of sample) through filtration assembly. Remaining portion of sample was poured into glass composite jar w/22B-ST1-B1. Black organic sludge w/oily sheen & strong decomposing organic odor.

Visual Description of Final Composite Sample: All four sed. trap bottles were composited into a 1x gallon glass composite jar after filtering off supernatant. Composite had a high water & organic content. Composite was black in color w/ visible sheen & strong decomposing organic odor (chemical odor).

COC Time (time composite jar is capped): **1317**

1403 PST

6/9/08

Total Dewatered/Filtered Sed. Weight in grams (g):

N/A - composite may need to be centrifuged.

Sample Jars Collected (number, size, full or partial):

1x partially full gallon composite

FO 080754

centrifuge

Composite was centrifuged on 6/9/08

Total wet weight = 364.4g

Duplicate sample collected? Y/N

DUPLICATE ID

Duplicate Sample ID on COC:

affix FO number sticker

Any deviations from standard operating procedures? **Y**

Describe: **SEE SAMPLE PROCESSING NOTES**



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory
6543 N. Burlington Ave
Portland, OR 97203-5452



INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: **PORTLAND HARBOR STORMWATER SAMP**

Project Number: **1020.005**

Sample Processing Conducted By:

Sample Pt. Code:

Removal Date:

Processing Date:

22B-ST1

5/28/08

5/30/08

Basin: **22B**

Hansen ID: **AAM060**

Subbasin: **N/A**

Sediment Trap Location Description/Address:

SEE NOTES FROM PAGE #1

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method:

Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system
[Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration
Equipment for Phthalates Technical Memorandum – September 18, 2007].

Filter brand, grade, porosity in micrometers (μ m) and material (e.g., Fisher Scientific, qualitative P2, 1-5 μ m cellulose filter paper):

SEE NOTES FROM PAGE #1

Sediment Trap Bottle ID: **22B-ST1-B3-**

Sediment Trap Bottle ID: **22B-ST1-B4-**

Total Est. Depth of Accumulated Sed in Bottle (inches): **0.5"**

Total Est. Depth of Accumulated Sed in Bottle (inches): **0.7"**

Sample Processing Start
Time: **1230 PST**

Sample Processing End
Time: **1252 PST**

Sample Processing Start
Time: **1255 PST**

Sample Processing End
Time: **1315 PST**

Number of Filters Used: **3 x P8 20-25um**

Number of Filters Used: **2 x P8 20-25um**

Est. total volume of Ultra Pure
DI used to remobilize adhered
stormwater solids within bottle in
milliliters (mL):

N/A

SEE NOTES

Est. total volume of Ultra Pure
DI used to remobilize adhered
stormwater solids within bottle in
milliliters (mL):

N/A

SEE NOTES

Tare Weight [empty jar in grams (g)]: **N/A**

Tare Weight [jar and filtered sed. from Bottle1 in grams (g)]:

N/A

Dewatered/Filtered Sed. Weight (g): **SEE NOTES**

Dewatered/Filtered Sed. Weight (g): **SEE NOTES**

SEE SAMPLE PROCESSING NOTES PAGE #1

SEE SAMPLE PROCESSING NOTES PAGE #1

Sample Processing Notes/Comments:

**Poured off ~ 700 mL of supernatant &
suspended sed. through filtration assembly.
Remaining portion of sample was poured
directly into glass composite jar.**

**Strong decomposing organic odor present
& chemical odor**

Sample Processing Notes/Comments:

**Poured off ~ 750 mL of supernatant
& suspended sed. through filtration
system.**

Strong decomposing organic odor present

Visual Description of Final Composite Sample:

COC Time (time composite jar is
capped):

Total Dewatered/Filtered Sed. Weight in
grams (g):

Sample Jars Collected (number, size, full or
partial):

Sample ID:

Duplicate sample collected? Y/N **DUPLICATE ID**

affix FO number sticker

Duplicate Sample ID on COC:

Any deviations from standard operating procedures? **Y/N**

affix FO number sticker

Describe: **SEE PROCESSING NOTES**



Page 1 of 2

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL FIELD LAB/22B-ST1

Date 5/30/08

Subject Basin 22B Sep. Trap Processing

By JXB

0922 PST- Setup second Portland Harbor, 90-millimeter (mm) stainless steel filter support w/ conical glass microfiltration system on a Lab cart covered w/ clean Versi-Dry Lab sealer paper. Connected MasterFlex peristaltic tubing to side-arm Erlenmeyer flask component in microfiltration system & peristaltic pump. MasterFlex tubing was flushed w/ DI & UPDI. ^{Equipped} ~~Equipped~~ filtration system w/ a Fisher Scientific qualitative P2 1-5um cellulose filter.

0950- Primed apparatus w/ UPDI & began to process 22B-ST1-B1. Slow, almost non-existent flow-through rates & continued clogging.

Switched to a qualitative P4 4-8um filter. Filters continue to clog.

^{Equipped} ~~Equipped~~ filtration system w/ a P8 20-25um filter. Non-existent flow-through rates & continued clogging are hindering filtration process.

22B-ST1 B1 has a high suspended sediment content & extremely high ^{volume of} decomposing organic material. As a result, there was a deviation from Field Operations (FO) SOP 5.01b. In order to process 22B-ST1 B1, supernatant was poured through filtration system w/ the remaining supernatant & sediment poured directly into a second 1xgallon glass stormwater composite jar. Filtrate (~350mL) slightly turbid & yellow.

1200-1304 JXB 1006 PST- Attempted to filter 22B-ST1-B2. Filters continued to clog. Filtered off portion of supernatant ^{through filtration system} & poured remaining slurry of supernatant & sediment into glass composite jar w/ 22B-ST1-B1. This deviation was ^{also} applied to 22B-ST1 B3 & B4. All trace sed. on filters from filtration ^{process} of supernatant portions was scrapped off of filters and added to ^{glass} composite jar using a second stainless steel spatula. Filtrate in filtration system ~~Attachments~~ (~550 mL) was turbid & gray in color.



Page 2 of 2

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL FIELD LAB/ 22B-ST1

Date 5/30/08

Subject BASIN 22B SED. TRAP PROCESSING

By JXB

1315- completed filtration deviation process for 22B-ST1

1317- Capped glass composite jar, thoroughly mixed contents of jar (high water content & organic/sediment material), and placed 22B-ST1 composite into ^{sample storage} Lab fridge. Composite sample will most likely need to be run through a centrifuge for subsequent analysis.

NOTE: Deviation from filtering SOP resulted in all 4x1L sed. trap bottles being composited directly in a 1xgallon glass composite stormwater jar after filtering a portion of supernatant from each sed. trap bottle. Remaining portion of sed material in bottles was poured directly into composite jar. Composite sample was high in water & organic content. Composite was black in color w/visible sheen & strong decomposing organic odor & chemical odor.



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory
6543 N. Burlington Ave
Portland, OR 97203-5452



INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: **PORTLAND HARBOR STORMWATER SAMP**

Project Number: **1020.005**

Sample Processing Conducted By:

JXB

Sample Pt. Code:

22B-ST2

Removal Date:

3/31/08

Processing Date:

6/2/08 - 6/3/08

Basin: **22B**

Hansen ID: **AAL961**

Subbasin: **N/A**

Sediment Trap Location Description/Address: **6952 NW Front Ave.**
Sed. traps were installed ~1.5 ft upstream of 24" inlet pipe along the invert.
24" pipe inlet is ~10" above manhole invert.

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method:

Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system
[Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration
Equipment for Phthalates Technical Memorandum - September 18, 2007].

Filter brand, grade, porosity in micrometers (µm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 µm cellulose filter paper):

Fisher Scientific, qualitative cellulose filter paper (P2, 1-5 µm and P4, 4-8 µm)

Sediment Trap Bottle ID: **22B-ST2-B1**

Sediment Trap Bottle ID: **22B-ST2-B2**
22B-ST2-B3

Total Est. Depth of Accumulated Sed in Bottle (inches): **~1.3"**

Total Est. Depth of Accumulated Sed in Bottle (inches): **~10.75"**

Sample Processing Start

Time: **1038 PST 6/2/08**

Sample Processing End

Time: **1450 PST 6/2/08**

Sample Processing Start

Time: **1045 PST 6/3/08**

Sample Processing End

Time: **1242 PST 6/3/08**

Number of Filters Used: **1x P2, 1-5 µm**
9x P4, 4-8 µm **2x P5, 5-10 µm**

Number of Filters Used: **8x P5, 5-10 µm**

Est. total volume of Ultra Pure
DI used to remobilize adhered
stormwater solids within bottle in
milliliters (mL):

~200 mL - 250 mL

Est. total volume of Ultra Pure
DI used to remobilize adhered
stormwater solids within bottle in
milliliters (mL):

~200 mL

Tare Weight [empty jar in grams (g)]:

134.4g

Tare Weight [jar and filtered sed. from Bottle 1 in grams (g)]: **226.8g**

Dewatered/Filtered Sed. Weight (g):

92.4g

Dewatered/Filtered Sed. Weight (g): **55.2 g**

Sample Processing Notes/Comments:

Long filter/processing time! Filtered sed. is
primarily dark sludge (high organic content).
Green present in sample w/ a high water content.
Strong decomposing organic odor present w/
slight PAH odor.

Sample Processing Notes/Comments:

Filtered sed. is primarily dark sludge
(high organic content).
Oily sheen on surface of filtered sed.
Strong decomposing organic odor present.

Visual Description of Final Composite Sample: **Dark black sludge (high organic content) w/ a visible**
sheen & strong decomposing organic odor.

COC Time (time composite jar is
capped): **1512**

Total Dewatered/Filtered Sed. Weight in
grams (g): **After Compositing = 189.7g**

Sample Jars Collected (number, size, full or
partial): **1x full 8 oz & 1x half-full 8 oz jar**

Sample ID:

FO 080755

Duplicate sample collected? Y/N

DUPLICATE ID

affix FO number

Duplicate Sample ID on COC:

Any deviations from standard operating procedures? **Y[Ⓝ]**

Describe:



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

Water Pollution Control Laboratory
6543 N. Burlington Ave
Portland, OR 97203-5452



INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: **PORTLAND HARBOR STORMWATER SAMP**

Project Number: **1020.005**

Sample Processing Conducted By:

Sample Pt. Code:

Removal Date:

Processing Date:

22B-ST2

5/28/08

6/2/08 - 6/3/08

Basin: **22B**

Hansen ID: **AAL961**

Subbasin: **N/A**

Sediment Trap Location Description/Address:

SEE PAGE No. 1

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

Filter Equipment/Method:

Portland Harbor, 90-millimeter (mm) stainless steel filter support w/conical glass microfiltration system
[Field Operations (FO) Standard Operating Procedure (SOP) 5.01b & Evaluation of Microfiltration
Equipment for Phthalates Technical Memorandum - September 18, 2007].

Filter brand, grade, porosity in micrometers (μm) and material (e.g., Fisher Scientific, qualitative P2, 1-5 μm cellulose filter paper):

SEE PAGE No. 1

Sediment Trap Bottle ID: **22B-ST2-B3 -**

Sediment Trap Bottle ID: **22B-ST2-B4 -**

Total Est. Depth of Accumulated Sed in Bottle (inches): **~0.6"**

Total Est. Depth of Accumulated Sed in Bottle (inches): **~0.6"**

Sample Processing Start

Sample Processing End

Time: **1255 PST 6/3/08**

Time: **1356**

Sample Processing Start

Sample Processing End

Time: **1404**

Time: **1440 PST**

Number of Filters Used: **7x P5 5-10 μm**

Number of Filters Used: **8x P5 5-10 μm**

Est. total volume of Ultra Pure
DI used to remobilize adhered
stormwater solids within bottle in
milliliters (mL):

~100 mL

Est. total volume of Ultra Pure
DI used to remobilize adhered
stormwater solids within bottle in
milliliters (mL):

~125 mL

Tare Weight [empty jar in grams (g)]: **134.5g**

Tare Weight [jar and filtered sed. from Bottle1 in grams (g)]: **158.7g**

Dewatered/Filtered Sed. Weight (g): **24.2g**

Dewatered/Filtered Sed. Weight (g): **27.2**

Sample Processing Notes/Comments:

**Filtered sed. is primarily fine silts & sands
& decomposing organic matter.**

strong organic decomposing odor present

Sample Processing Notes/Comments:

**Filtered sed. is primarily fine silts &
sands & decomposing organic matter**

strong organic decomposing odor present

Visual Description of Final Composite Sample:

COC Time (time composite jar is
capped):

Total Dewatered/Filtered Sed. Weight in
grams (g):

Sample Jars Collected (number, size, full or
partial):

Sample ID:

affix FO number sticker

Duplicate sample collected? Y/N **DUPLICATE ID**

Duplicate Sample ID on COC:

affix FO number sticker

Any deviations from standard operating procedures? Y/N

Describe:



Page 1 of 1

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location 22B-ST2/WPLL FIELD LAB

Date 6/2/08

Subject BASIN 22B SED. TRAP PROCESSING

By JXB/JJM

1038 PST - Setup ^{second} ~~decont~~ Portland Harbor, 90-millimeter (mm) stainless steel filter support w/ conical glass microfiltration system on lab cart covered w/ clean Versi-Dry lab soaker paper. Flushed Master Flex peristaltic tubing (Flushed w/ DI & UPDI). Attached peristaltic tubing to side-arm of Erlenmeyer flask in microfiltration system & to peristaltic pump. Equipped filter w/ P2 1-5um filter.

1038 - Began to ^{JXB 6/2/08} ~~pres~~-process/filter sediment from 22B-ST2-B1. Took photos of 22B-ST2-B1. Switched from a P2, 1-5um cellulose filter to a P4, 4-8um filter due to slow flow-through rates & filter clogging. Subsequently switched to a ^{P5} ~~P2~~ 5-10um filter during the last 200-300 mL of supernatant & sed. filtration. Filtered sed. was dark, ^{w/a} high water content, sludge (decomposing organics) w/a pungent decomposing organic & PAH odor ~~w/a~~ visible sheen present.

121414 - Began to filter last of sed. adhered to inside surface of 22B-ST2-B1. Used approx. 200-250 mL of UPDI to remobilize stormwater solids. Total dewatered/filtered sed from 22B-ST2-B1 = approx. 92.4 g wet weight.

Photos taken of 22B-ST2-B1 included:

1016 PST - 22B-ST2-B1 adjacent to dry erase board.

1314 & 1343 PST - Filtered sed on filter stand x 2

1352 PST - Spent filters from 22B-ST2-B1 processing

1450 - Completed processing of 22B-ST2-B1

Attachments



Page 1 of 3

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL FIELD LAB/22B-ST2

Date 6/3/08

Subject BASIN 22B SED. TRAP PROCESSING

By JXB

1014 PST - Took a photo of 22B-ST2-B2 sed. trap bottle, prior to processing adjacent to dry erase board.

1021 - Continued to process/filter samples from Basin 22B following the initial processing on 6/2/08. Began to process archived sed. trap bottle 22B-ST2-B2 using Portland Harbor microfiltration system. Microfiltration system was closed off to the Lab atmosphere overnight using aluminum foil & Lab Parafilm to create a closed system. Due to fine, high organic content observed in 22B-ST2-B1 on 6/2/08, a ^{JXB} ~~PS~~ ^{PS} 5-10um qualitative Cellulose filter was selected during initial filtration of 22B-ST2-B2 (to mitigate clogging of filter). Primed microfiltration system w/ UPDI. 1045 PST - First aliquot from 22B-ST2-B2 poured into system.

1135 - Took a photo of filtered sed from 22B-ST2-B2. Primed microfiltration system ^{W/ UPDI}. Scrapped filtered sed off filter & placed into composite jar.

1157 - Captured a photo of filtered sed (^{bio-}cake) processed from 22B-ST2-B2. Primed filter system. Scrapped filtered sed off filter & placed into composite jar.

1228 - Noticable sheen on surface of filtered sed during last ~200 mL of sed. & supernatant. Used approx. 200 mL ^{1 of UPDI} to resuspend solids adhered to inside wall of sed trap bottle. Captured a ~~picture~~ picture of oily sheen on ~~surface~~ ^{surface} of filtered sed.

¹²⁴² 1243 - Finished processing 22B-ST2-B2. Took photos of spent filters.

Attachments



Page 2 of 3

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL FIELD LAB/22B-ST2

Date 6/3/08

Subject BASIN 22B SED. TRAP PROCESSING

By JXB

1249 PST - Took a photo of 22B-ST2-B3 archived sed. trap bottle prior to processing.

1255 PST - Began to process 22B-ST2-B3. Due to high organic content observed in 22B-ST2-B1 & B2 on 6/2-6/3, microfiltration system was equipped w/ a PS, 5-10um qualitative cellulose filter, to mitigate continued filter clogging. Primed filtration system w/ UPDI.

1315 - Filtered sed from 22B-ST2-B3 is different than 22B-ST2-B1 & B2, primarily ^{JXB}primarily consisting of fine silts & sands ^{w/ organic material}. Took a photo of filtered sed. 1356 PST - Finished processing 22B-ST2-B3

1357 - Captured photo of spent filters from 22B-ST2-B3 processing.

1404 - Began to process 22B-ST2-B4 archived sed. trap bottle using a PS, 5-10um qualitative cellulose filter.

1404-1419 - Took picture of filtered sed on top of filter paper. Filtered sed. primarily consists of fine silts & sands w/ decomposing organic matter. No visible sheen present on surface of filtered sed. Scrapped all filtered sed from filters and placed into composite jar using a decontaminated stainless steel spatula. Processed sed. may exceed 8-oz?

1421 - Filtered sediment exceeded 1 x ^{4 JXB} 8-oz jar. (^{4 JXB} 1 3/4 x 8-oz jars were filled w/ filtered sed @ completion of filtering process).

Attachments 1440 PST - Completed filtration processing of 22B-ST2-B4.



Page 3 of 3

Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location WPCL FIELD LAB/22B-ST2

Date 6/3/08

Subject BASIN 22B SED. TRAP PROCESSING

By JXB

1443 - Due to excess volume of filtered sed^{the} & additional ¹/₂ oz sediment sample jar, All contents from both jars were ^{JXB} emptied into a decont stainless steel bowl for subsequent compositing following the filtration process. Took a photo of all spent filters.

1505 - Thor Thoroughly mixed all filtered sed from archived Sed. trap bottles from 22B-ST2 in a ^{decont} stainless steel bowl w/ a ^{decont} stainless steel spatula. Homogenized composite was transferred directly into 2 x ^{JXB} 8-oz amber, wide mouth sediment sample jars.

1512 - Placed composite sample into lab ^{JXB} cooler after capping jars. Total composite weight after filtration & compositing = ~189.7g.



Page 1 of 3

Project PORTLAND HARBOR STORMWATER STMP.

Project No. 1020.005

Location WPCL FIELD LAB / 22B-ST1

Date 6/9/08

Subject BASIN 22B CENTRIFUGE PROCESSING.

By JXB/DTT

BACKGROUND: Due to a high decomposing organic content/sediment slow flow-through rates, and continued filter clogging during the initial 22B-ST1 sed trap processing (5/30/08), Field Operations filtered a portion of supernatant from all ~~4x1L~~^{4x3} 4x1L sed. trap bottles through the PDX Harbor Filtration assembly (~2400 mL). The remaining organic material & solids were poured directly into a 1xgallon glass stormwater composite jar & composited. This deviation ^{from} Field Operations (FO) SOP S.01b was thoroughly documented. ^{JXB}

ALL TIMES IN PST

1047 - Filled two 50-mL Polypropylene (PPE) conical centrifuge tubes w/ 22B-ST1 composite as a test to see ^{whether} ~~whether~~ organic material & solids could be separated/spun out of supernate. Ran the two test tubes in the WPCL Metals Department centrifuge for ~10 minutes. Centrifuge process successfully removed solids & suspended solids from supernate.

Tared a 4-oz amber sediment jar. Removed solids from test tubes after decanting ~~spat~~ spun supernate into a decand 1xgallon, glass stormwater composite jar, using a decand stainless scoopula. Placed spun solids into 4-oz jar.

1100 - Repeated the same process as in the test phase. Filled 12x50mL PPE conical centrifuge tubes w/ 22B-ST1 composite. ^{using a decand stainless funnel} Captured photos of centrifuge & 50 mL centrifuge tubes. Due to strong organic decomposing odor & a caustic strong chemical odor present in 22B-ST1 composite, this procedure & all subsequent processing was conducted in a fume hood.

Attachments →

Ran centrifuge for ~10 minutes.



Page 2 of 3

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL FIELD LAB/22B-ST1

Date 6/9/08

Subject 13ASIN 22B CENTRIFUGE PROCESSING

By JXB/DTT

1111 - Removed 50 mL PPF conical centrifuge tubes from centrifuge. Captured photos of centrifuge tubes w/ spun out solids in the bottom of the sample tubes & a layer of supernate above the solids. Poured supernate, into 1xgallon "supernate jar", from all 12-50mL centrifuge tubes. Removed spun out solids from sample tubes using a deconid stainless scoopula & placed solids directly into 4oz sample jar.

1140-continued to process 22B-ST1 composite using centrifuge. Re-filled 50 mL centrifuge tubes w/ 22B-ST1 composite & ran for 10 minutes.

1210^{The} - Supernate in the centrifuge tubes from the second run of the centrifuge ^{JXB} were very turbid & gray in color. Observed large volumes of solids in the bottom of the centrifuge tubes. Poured off supernate into 1xgallon "supernate jar" & removed solids w/ a stainless scoopula. Filled first 4-oz amber jar w/ solids from second centrifuge run. Captured photos of supernate & solids.

First 4-oz amber jar $\Rightarrow$ Tare weight of jar w/ lid on = 131.7g

Total wet weight of centrifuged solids = 126.7g

1258 - Continued to process 22B-ST1 using centrifuge, emptying remaining composite into 50 mL PPF centrifuge tubes. Ran centrifuge for ~10 minutes.

1312- Poured off supernate from 3rd run of centrifuge back into original 22B-ST1 composite jar to remobilize ^{remaining} solids adhered to inside wall.

Attachments - Of composite jar. Removed solids from centrifuge tubes & placed solids into 2nd 4-oz amber jar.



Page 3 of 3

Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020.005

Location WPCL FIELD LAB/ 22B-ST1

Date 6/9/08

Subject BASIN 22B CENTRIFUGE PROCESSING-

By JXB/DTH

~~1342-1312~~ - (cont.) Filled 2nd 4-oz amber jar w/ solids from third centrifuge run.

Second 4-oz amber jar w/ lid on $\Rightarrow$ tare weight = 135.0g

Total wet weight of centrifuged solids = 119.8g

1344 - Continued to process 22B-ST1 composite using centrifuge. Filled 50 mL ^{PPE} centrifuge tubes w/ supernate used to remobilize solids adhered to inside walls of composite jar. Ran centrifuge for ~10 minutes. Poured off the last of the supernate from the centrifuge tubes & removed centrifuged solids using a stainless scoopula. Partially filling third 4-oz amber jar.

Third 4-oz amber jar w/ lid on $\Rightarrow$ tare weight = 134.5g

Total wet weight of centrifuged solids = 17.9g

1403 - Captured photo of 22B-ST1 final composite after centrifuge processing.

22B-ST1 - Total wet weight of solids = 264.4g (3-4oz amber jars)

Placed composite sample in Staging Lab Fridge for subsequent analysis.

Date: 5/13/08
Page: 1 of 1
Collected By: JXB

[illegible]



Page 1 of 1

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPCL FIELD LAB

Date 5/13/08

Subject EQUIPMENT BLANK

By JXB

1504 PDT- Placed decontaminated Portland Harbor 90mm, conical glass microfiltration system w/ stainless steel filter support onto lab cart ^{which was} covered w/ clean vers-i-dry paper. Assembled microfiltration system. ^{All} Glass components for microfiltration system were deconed w/ lab-grade detergent, tap water, nitric acid, DI water, Acetone, DI water & UPDI water. Components were allowed to air-dry. All metal microfiltration components ^{received} ~~received~~ the full decon procedure minus a nitric dip. ^{this} ~~the~~ deviation ^{JXB} ~~is~~ from Field Operations SOP 7.01a (use of acetone solvent) has been previously documented ^{is} based on analyte priority lists & PCB analysis.

Connected deconed Masterflex peristaltic tubing (rinsed w/ UPDI water) ^{attached tubing to} to microfiltration system side-arm beaker & peristaltic pump. Turned on peristaltic pump to generate negative air pressure vacuum.

1531- Filled 2x 1200 mL deconed stainless steel beakers w/ UPDI water from WPCL Field Lab ^{UPDI} station. Began EQBLANK. Poured UPDI water through microfiltration system w/ 90mm stainless steel filter support & 90mm cellulose, Grade P2, 1-5um filter paper, installed in microfiltration system.

1541- Filled 1x 1L amber glass bottle & 1x pre-cleaved Nalgene metals bottle w/ UPDI water filtrate for EQBLANK analysis ^(Total metals) ^(PAH + Pthalates)

Attachments

FO 080655

1554- Relinquished EQBLANK sample.

JXB

TABLE 1
STEPWISE DECONTAMINATION PROCEDURE
SOP 7.01A – DECONTAMINATION OF SAMPLING EQUIPMENT

Use the following steps to determine the correct equipment decontamination process. First determine the equipment to be decontaminated. Then, starting at Step 1, answer the questions proceeding to Step 9. Check the boxes in the right column. The resulting checked boxes indicate the appropriate decontamination process.

Project Name: PORTLAND HARBOR STORMWATER SAMP.

Project Number: 1020.005

Date: 5/7/08

Description of item to be decontaminated: 90mm, Conical glass micro filtration assembly

Step Number	Decontamination Process	Check boxes below as necessary
Step 1	Wash with non-phosphate detergent solution, proceed to Step 2	☒ 1% Non-phosphate wash
Step 2	Rinse with tap water, proceed to Step 3	☒ Tap water rinse
Step 3	Is sample to be analyzed for metals or nutrients? ☒ Yes – Does equipment have metal parts? Yes – Skip this step. Proceed to Step 5 ☒ No – Wash with 10% nitric acid solution, Proceed to Step 4 No – Proceed to Step 5	☒ 10% nitric acid wash
Step 4	Rinse with DI water, proceed to step 5	☒ DI water rinse
Step 5	Is sample to be analyzed for organics? No – Proceed to Step 7 ☒ Yes – Does analyte list include TOC, DOC, SOC analytes? — <u>see work order JXB5/7/08</u> ☒ Yes – Omit this step, proceed to Step 7 ☒ No – Does analyte list include PCBs? ☒ Yes – Wash with acetone, proceed to Step 6 ☒ No – Wash with 10% methanol/isopropyl alcohol solution, proceed to Step 6	

TABLE 1
STEPWISE DECONTAMINATION PROCEDURE
SOP 7.01A – DECONTAMINATION OF SAMPLING EQUIPMENT

Use the following steps to determine the correct equipment decontamination process. First determine the equipment to be decontaminated. Then, starting at Step 1, answer the questions proceeding to Step 9. Check the boxes in the right column. The resulting checked boxes indicate the appropriate decontamination process.

Project Name: PORTLAND HARBOR STORMWATER SAMP.

Project Number: 1020,005

Date: 5/7/08

Description of item to be decontaminated: Stainless steel sediment sampling equipment, spatulas, 90mm conical glass stainless steel filter support.

Step Number	Decontamination Process	Check boxes below as necessary
Step 1	Wash with non-phosphate detergent solution, proceed to Step 2	☒ 1% Non-phosphate wash
Step 2	Rinse with tap water, proceed to Step 3	☒ Tap water rinse
Step 3	Is sample to be analyzed for metals or nutrients? <u>Yes</u> - Does equipment have metal parts? <u>Yes</u> - Skip this step. Proceed to Step 5 No - Wash with 10% nitric acid solution, Proceed to Step 4 No - Proceed to Step 5	☐ 10% nitric acid wash
Step 4	Rinse with DI water, proceed to step 5	☐ DI water rinse
Step 5	Is sample to be analyzed for organics? No - Proceed to Step 7 <u>Yes</u> - Does analyte list include TOC, DOC, SOC analytes? <u>Yes</u> - Omit this step, proceed to Step 7 No - Does analyte list include PCBs? <u>Yes</u> - Wash with acetone, proceed to Step 6 No - Wash with 10% methanol/isopropyl alcohol solution, proceed to Step 6	<u>see work order JXB 5/7/08</u> ☒ Acetone Wash ☐ 10% methanol wash
Step 6	Rinse with DI water, proceed to Step 7	☒ DI water rinse
Step 7	Rinse with ultrapure DI water, proceed to Step 8.	☒ Ultrapure DI water rinse
Step 8	Collect quality control blank samples per SOP 7.01c	
Step 9	Is sample to be used to collect metals samples?	☐ Wrap equipment in clean plastic bag.
	Is equipment to be used to collect organics samples?	☐ Wrap equipment in clean aluminum foil.

Matrix: SEDIMENT

Requested Analyses

General

Metals

Comments

Field Comment: blank performed on Nalgene 32-oz., certified "EPA Clean," HDPE round narrow-mouth bottle purchased from Numborg, October 2007. No FO cleaning or rinsing performed. Bottles were filled with ultra-pure deionized water (UPDI), capped, and allowed to sit for ~8-days. Blank water was poured off into analyte-specific containers

WPCL Sample I.D.**Location**

Point Code	Sample Date	Sample Time	Sample Type
------------	-------------	-------------	-------------

PAH + Phthalates (Low-level)

**Total Metals (Al, Sb, As, Cd Cr
Cu, Pb, Mn, Ni, Ag, Zn) + Hg**

FO 071283

BLANK OF NALGENE
BOTTLE

EQBLANK

10/23/07	1207
----------	------

5

Relinquished By: 1

Time:

Relinquished By: 2

Time:

Relinquished By: 3

Relinquished By: 4

Time

Printed Name:

10

Printed Name:

1

Printed Name:

Printed Name:

1

Signature: _____

1

Signature:

1

Signature: _____

Signature:

Printed Name: Ross

Hi-Hari

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OF

September 2007).xls

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Page 1 of 1

Project PORTLAND HARBOR STORMWATER SAMP.

Project No. 1020.005

Location WPC FIELD LAB

Date 10/23/07

Subject DES3A SED TRAP BOTTLE BLANK

By JXB

BACKGROUND - 2x Nalgene 32-oz., certified "EPA clean," HDPE round narrow-mouth bottles were filled w/UPDI on 10/15/07 @ ≈ 1357 PDT, capped, and allowed to sit for ≈ 8 -days. Bottles were purchased from Nurnberg, October 2007. Bottles were not cleaned or rinsed by FO prior to bottle blank. JXB

10/23/07 @ 1207 PDT - Blank water from EPA clean bottles was poured off into analyte-specific containers/bottles after sitting for ≈ 8 -days.



Scientific Products LLC

Where clean is critical

QC-B-003

Rev. 3

9/21/05

200 B.J. Tunnell Blvd.

Miami OK. 74354

Certificate of Analysis

BOTTLE TYPE Plastic QA LEVEL 1 LOT NO 027996
DESCRIPTION 150-01W/N; 1 Liter Narrow Mouth Nalgene Bottle

INORGANIC QUALITY ASSURANCE

EP Scientific products have been tested and found to comply with or to be lower than the EPA detection limits as stated in OSWER Directive # 9240.0-05A "Specifications And Guidance For Contaminant-Free Sample Containers 12/92".

Compound	Quantitation Limit ($\mu\text{g/L}$)	Compound	Quantitation Limit ($\mu\text{g/L}$)
Aluminum	< 80	Manganese	< 10
Antimony	< 5	Mercury	< 0.2
Arsenic	< 2	Nickel	< 20
Barium	< 20	Nitrate	< 20
Beryllium	< 0.5	Nitrite	< 20
Cadmium	< 1	Paraquat (amber only)	< 0.4
Calcium	< 500	Potassium	< 750
Calcium (all HDPE)	< 100	Potassium (all HDPE)	< 100
Chloride	< 100	Selenium	< 2
Chromium	< 10	Silver	< 5
Cobalt	< 10	Sodium	< 500
Copper	< 10	Sodium (all HDPE)	< 100
Cyanide	< 10	Sulfate	< 100
Diquat	< 1.0	Sulfide	< 30
Fluoride	< 20	Sulfite	< 1000
Iron	< 50	Thallium	< 5
Lead	< 2	Vanadium	< 10
Magnesium	< 100	Zinc	< 10

IF EP SCIENTIFIC PRODUCTS CAN BE OF ANY FURTHER ASSISTANCE, PLEASE CALL (800) 331-7425 AND ASK FOR OUR TECHNICAL SERVICE DEPARTMENT.

BOTTLES RECD 10/12/07
FOR DOX HARBOR STORMWATER SAMP
SED TRAPS.

Approved By:

James L. Riner

James L. Riner
Quality Assurance

EP Scientific Products
200 B.J. Tunnell Blvd.
Miami, Ok 74354

NOTE - "EPA CLEAN" BOTTLES USED FOR OFS3A
SED TRAP INSTALLATIONS ON 10/15/07 for wet weather
(07/08) season

Attachment C
Laboratory Results

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55 SW Yamhill Street, Suite 400 Portland, OR 97204
P: 503.239.8799 F: 503.239.8940
info@gsiwatersolutions.com www.gsiwatersolutions.com

Laboratory Data QA/QC Review Upland Source Control Investigation Outfall Basin 22B

To: File
From: Erin Carroll, GSI
Date: February 20, 2009

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during source control sampling and analyses conducted by the City of Portland (City) in June 2008 in Outfall Basin 22B. The results of the sampling and analysis are presented in the Technical Memorandum No. OF22B-4.

The laboratory analysis of the OF-22B solids samples was conducted by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and subcontracted laboratories. The following laboratories conducted the analyses listed:

- BES WPCL
 - o Metals – EPA 6020
 - o Total Solids – SM 2540 G
- Test America (TA)
 - o Total Organic Carbon (TOC) – EPA 9060 MOD
- Columbia Analytical Services (CAS)
 - o Organochlorine Pesticides – EPA 8081A
- Pace Analytical Services (Pace)
 - o Polychlorinated Biphenyl (PCB) Congeners – EPA 1668A

The WPCL summary report for all analyses associated with this sediment trap sampling event and the subcontracted laboratory's data reports are included along with this QA/QC review in Attachment C to Technical Memorandum No. OF22B-4. The WPCL summary report comments that unless otherwise noted, all analytical QA/QC criteria were met for these samples including

holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

The following QA/QC review of the analytical data, based upon the available documentation supplied from each subcontracted laboratory and on exceptions noted in the WPCL summary report. The QA/QC review of the analytical data consisted of reviewing the following for each laboratory report, if available:

- Chain-of-custody for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate recoveries within laboratory control limits
- Internal standard recoveries within laboratory control limits
- Matrix spike and matrix spike duplicate results within laboratory control limits
- Laboratory control sample and duplicate laboratory control sample recoveries within laboratory control limits

The results of the QA/QC review of the subcontracted laboratory reports are presented below.

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures were adequate and sample integrity was maintained through the sample collection and delivery process.

Analysis Holding Times

The samples were extracted and analyzed within the required method-specific holding times.

Method Blanks

Method blanks were processed during the subcontracted laboratory analyses of organochlorine pesticides, PCB congeners and TOC. PCB congeners were detected in the laboratory method blank. However, as reported by Pace, the detections in the sediment trap samples were greater than 10 times the detections in the method blank and therefore are not considered statistically different from background levels. No detections occurred in the method blanks for the other analyses.

Surrogate Recoveries

Surrogate recoveries were completed during the subcontracted laboratory analysis of organochlorine pesticides. All surrogate recoveries were within laboratory control limits.

Internal Standard Recoveries

Internal standard recoveries were processed during the laboratory analysis of PCB congeners. All except three of the labeled internal standard recoveries were within the target ranges specified in the method. These exceptions are flagged “P” in the Pace laboratory report. Analyte

levels exhibiting isotope ratios outside of the acceptance ranges were flagged “I” by Pace, and the results are reported as estimated maximum possible concentrations (EMPC). Pace states that the data were automatically corrected for variation in recovery and accurate values were obtained.

Matrix Spike/Matrix Spike Duplicates

CAS performed matrix spike/matrix spike duplicate (MS/MSD) analyses for organochlorine pesticides. The matrix spike recoveries of alpha-BHC, delta-BHC, and endosulfan I were outside of control criteria, which suggests a potential low bias for this sample. However, the LCS recovery was acceptable indicating that the batch was in control.

Laboratory Control / Duplicate Laboratory Control Samples

Laboratory control/duplicate laboratory control samples (LCS/DLCS) were processed during the laboratory analysis of PCB Congeners. A LCS sample was processed during the laboratory analysis of organochlorine pesticides and TOC. All laboratory control sample recoveries and/or relative percent differences (RPD) were within laboratory control limits.

Other

Some organochlorine pesticide compounds are reported as estimated (“P” or “EST”) because the results from the primary and verification gas chromatography columns varied by more than 40 percent RPD. The method detection limits for beta-BHC and delta-BHC were elevated due to sample matrix effects. The reporting limits for all organochlorine pesticides are elevated due to sample dilution.

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
(503) 823-5696



City of Portland
Chain-of-Custody
Bureau of Environmental Services



Date: 6/9/08
Page: 1 of 1
Collected By: JXB

Project Name: PORTLAND HARBOR STORMWATER SAMP

File Number: 1020.005

Matrix: SEDIMENT

Requested Analyses

Outfall 22B Sediment Traps

Sediment traps installed: 12/13/07; removed: 5/28/08
Total Solids to be done at WPCI, care should be taken to use the smallest aliquot possible to retain sample volume for additional follow-up analyses.

WPCI Sample I.D.

FO 080754

FO 080755

Location	Point Code	Sample Date	Sample Time	Sample Type
ST-22B-AAL050-0608 6529 NW FRONT - DRIVEWAY	22B-ST1	6/9/08	1403	C
ST-22B-AAL961-0608 6529 NW FRONT - NW OF DRIVEWAY	22B-ST2	6/3/08	1512	C

PCB Congeners (All 209)	X
PCB Aroclors	X
TOC	X
TS*	X
Organo-chlorine Pesticides	X
PAH + Phthalates (Low-level)	X
Herbicides	X
Total Metals (Al, Sb, As, Cd Cr Cu, Pb, Mn, Ni, Ag, Zn) + Hg	X

*Strong chemical odor open in hood
% Solids = 21.8 264.4 g Total Wet Weight
% Solids = 19.9 189.7 g Total Wet Weight

Added by
JXB
6/19/08

Relinquished By: 1	Signature: [Signature]	Time: 1605	Relinquished By: 2	Signature: [Signature]	Time: [Blank]	Relinquished By: 3	Signature: [Signature]	Time: [Blank]	Relinquished By: 4	Signature: [Signature]	Time: [Blank]
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Printed Name: Jeremiah Banden	Date: 6/9/08	Received By: 1	Signature: [Signature]	Time: 1605	Printed Name: [Blank]	Date: [Blank]	Received By: 2	Signature: [Signature]	Time: [Blank]	Printed Name: [Blank]	Date: [Blank]	Received By: 3	Signature: [Signature]	Time: [Blank]	Printed Name: [Blank]	Date: [Blank]	Received By: 4	Signature: [Signature]	Time: [Blank]	Printed Name: [Blank]	Date: [Blank]
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Printed Name: KATS MENNIS	Date: 6/9/08	Signature: [Signature]	Time: [Blank]	Printed Name: [Blank]	Date: [Blank]	Signature: [Signature]	Time: [Blank]	Printed Name: [Blank]	Date: [Blank]	Signature: [Signature]	Time: [Blank]	Printed Name: [Blank]	Date: [Blank]	Signature: [Signature]	Time: [Blank]	Printed Name: [Blank]	Date: [Blank]	Signature: [Signature]	Time: [Blank]	Printed Name: [Blank]	Date: [Blank]
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City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO080754

Sample Collected: 06/09/08 14:03
Sample Received: 06/09/08

Sample Status: COMPLETE AND VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-22B-AAM060-0608
6529 NW FRONT AVE 200FT NE OF NW 61ST DS
Sample Point Code: 22B_ST1
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 2

System ID: AM05572
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB

Comments:

QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Pesticide results reported as estimates exhibited variability >40% on the confirmation column; raised reporting limits for Pesticides are due to matrix interferences which were still present after extract clean-up procedures were applied.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	21.8	% W/W	0.01	SM 2540 G	06/10/08
METALS					
ALUMINUM	16200	mg/Kg dry wt	10	EPA 6020	06/18/08
ANTIMONY	13.2	mg/Kg dry wt	0.10	EPA 6020	06/18/08
ARSENIC	13.3	mg/Kg dry wt	0.50	EPA 6020	06/18/08
CADMIUM	13.8	mg/Kg dry wt	0.10	EPA 6020	06/18/08
CHROMIUM	207	mg/Kg dry wt	0.50	EPA 6020	06/18/08
COPPER	316	mg/Kg dry wt	0.25	EPA 6020	06/18/08
LEAD	651	mg/Kg dry wt	0.10	EPA 6020	06/18/08
MANGANESE	535	mg/Kg dry wt	1.0	EPA 6020	06/18/08
MERCURY	5.21	mg/Kg dry wt	0.010	EPA 6020	06/18/08
NICKEL	91.8	mg/Kg dry wt	0.25	EPA 6020	06/18/08
SILVER	2.17	mg/Kg dry wt	0.10	EPA 6020	06/18/08
ZINC	2290	mg/Kg dry wt	0.50	EPA 6020	06/18/08
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	246000	mg/Kg dry wt	100	EPA 9060 MOD	06/24/08
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	EST 180	µg/Kg dry wt	12	EPA 8081A	06/17/08
4,4'-DDE	EST 48	µg/Kg dry wt	12	EPA 8081A	06/17/08
4,4'-DDT	<110	µg/Kg dry wt	110	EPA 8081A	06/17/08
Aldrin	EST 19	µg/Kg dry wt	12	EPA 8081A	06/17/08
Alpha-BHC	<12	µg/Kg dry wt	12	EPA 8081A	06/17/08
Alpha-Chlordane	150	µg/Kg dry wt	12	EPA 8081A	06/17/08
Beta-BHC	<44	µg/Kg dry wt	44	EPA 8081A	06/17/08
Delta-BHC	<32	µg/Kg dry wt	32	EPA 8081A	06/17/08
Dieldrin	910	µg/Kg dry wt	120	EPA 8081A	06/17/08
Endosulfan I	<14	µg/Kg dry wt	14	EPA 8081A	06/17/08
Endosulfan II	<12	µg/Kg dry wt	12	EPA 8081A	06/17/08
Endosulfan Sulfate	<82	µg/Kg dry wt	82	EPA 8081A	06/17/08
Endrin	66	µg/Kg dry wt	12	EPA 8081A	06/17/08
Endrin Aldehyde	<12	µg/Kg dry wt	12	EPA 8081A	06/17/08
Endrin Ketone	<12	µg/Kg dry wt	12	EPA 8081A	06/17/08
Gamma-BHC(Lindane)	<12	µg/Kg dry wt	12	EPA 8081A	06/17/08

Report Date: 08/21/08

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: FO080754

Sample Collected: 06/09/08 14:03
Sample Received: 06/09/08

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-22B-AAM060-0608
6529 NW FRONT AVE 200FT NE OF NW 61ST DS
Sample Point Code: 22B_ST1
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 2 of 2

System ID: AM05572
EID File # : 1020.005
LocCode: PORTHASW
Collected By: JXB

Comments:

QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Pesticide results reported as estimates exhibited variability >40% on the confirmation column; raised reporting limits for Pesticides are due to matrix interferences which were still present after extract clean-up procedures were applied.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Gamma-Chlordane	230	µg/Kg dry wt	12	EPA 8081A	06/17/08
Heptachlor	EST 21	µg/Kg dry wt	12	EPA 8081A	06/17/08
Heptachlor Epoxide	22	µg/Kg dry wt	12	EPA 8081A	06/17/08
Methoxychlor	<35	µg/Kg dry wt	35	EPA 8081A	06/17/08
Toxaphene	<800	µg/Kg dry wt	800	EPA 8081A	06/17/08
POLYCHLORINATED BIPHENYL CONGENERS -PACE					
Refer to Contract Report	Completed	ng/Kg dry wt		EPA 1668 MOD	07/28/08

End of Report for Sample ID: FO080754

Report Date: 08/21/08

Validated By:



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO080755**

Sample Collected: 06/03/08 15:12
Sample Received: 06/09/08

Sample Status: **COMPLETE AND
VALIDATED**

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-22B-AAL961-0608
6529 NW FRONT AVE 400FT NE OF NW 61ST US
Sample Point Code: 22B_ST2
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 2

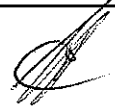
System ID: AM05573
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB

Comments:

QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Pesticide results reported as estimates exhibited variability >40% on the confirmation column; raised reporting limits for Pesticides are due to matrix interferences which were still present after extract clean-up procedures were applied.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	19.9	% W/W	0.01	SM 2540 G	06/10/08
METALS					
ALUMINUM	425	mg/Kg dry wt	10	EPA 6020	06/18/08
ANTIMONY	0.11	mg/Kg dry wt	0.10	EPA 6020	06/18/08
ARSENIC	4.98	mg/Kg dry wt	0.50	EPA 6020	06/18/08
CADMIUM	3.15	mg/Kg dry wt	0.10	EPA 6020	06/18/08
CHROMIUM	2.36	mg/Kg dry wt	0.50	EPA 6020	06/18/08
COPPER	6.80	mg/Kg dry wt	0.25	EPA 6020	06/18/08
LEAD	68.4	mg/Kg dry wt	0.10	EPA 6020	06/18/08
MANGANESE	150	mg/Kg dry wt	1.0	EPA 6020	06/18/08
MERCURY	0.054	mg/Kg dry wt	0.010	EPA 6020	06/18/08
NICKEL	11.8	mg/Kg dry wt	0.25	EPA 6020	06/18/08
SILVER	<0.10	mg/Kg dry wt	0.10	EPA 6020	06/18/08
ZINC	960	mg/Kg dry wt	0.50	EPA 6020	06/18/08
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	240000	mg/Kg dry wt	100	EPA 9060 MOD	06/24/08
PESTICIDES BY EPA 8081 - CAS					
4,4'-DDD	EST 130	µg/Kg dry wt	13	EPA 8081A	06/17/08
4,4'-DDE	EST 39	µg/Kg dry wt	13	EPA 8081A	06/17/08
4,4'-DDT	<120	µg/Kg dry wt	120	EPA 8081A	06/17/08
Aldrin	<13	µg/Kg dry wt	13	EPA 8081A	06/17/08
Alpha-BHC	<13	µg/Kg dry wt	13	EPA 8081A	06/17/08
Alpha-Chlordane	94	µg/Kg dry wt	13	EPA 8081A	06/17/08
Beta-BHC	<35	µg/Kg dry wt	35	EPA 8081A	06/17/08
Delta-BHC	EST 81	µg/Kg dry wt	13	EPA 8081A	06/17/08
Dieldrin	1200	µg/Kg dry wt	130	EPA 8081A	06/17/08
Endosulfan I	<13	µg/Kg dry wt	13	EPA 8081A	06/17/08
Endosulfan II	<13	µg/Kg dry wt	13	EPA 8081A	06/17/08
Endosulfan Sulfate	<56	µg/Kg dry wt	56	EPA 8081A	06/17/08
Endrin	57	µg/Kg dry wt	13	EPA 8081A	06/17/08
Endrin Aldehyde	<13	µg/Kg dry wt	13	EPA 8081A	06/17/08
Endrin Ketone	<13	µg/Kg dry wt	13	EPA 8081A	06/17/08
Gamma-BHC(Lindane)	<13	µg/Kg dry wt	13	EPA 8081A	06/17/08

Report Date: 08/21/08

Validated By: 



City of Portland
Water Pollution Control Laboratory
6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656



LABORATORY ANALYSIS REPORT

Sample ID: **FO080755**

Sample Collected: 06/03/08 15:12
Sample Received: 06/09/08

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-22B-AAL961-0608
6529 NW FRONT AVE 400FT NE OF NW 61ST US
Sample Point Code: 22B_ST2
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 2 of 2

System ID: AM05573
EID File #: 1020.005
LocCode: PORTHASW
Collected By: JXB

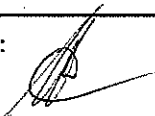
Comments:

QA/QC: Unless otherwise noted, all analytical QA/QC criteria were met for this sample including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable. Pesticide results reported as estimates exhibited variability >40% on the confirmation column; raised reporting limits for Pesticides are due to matrix interferences which were still present after extract clean-up procedures were applied.

Test Parameter	Result	Units	MRL	Method	Analysis Date
Gamma-Chlordane	110	µg/Kg dry wt	13	EPA 8081A	06/17/08
Heptachlor	<13	µg/Kg dry wt	13	EPA 8081A	06/17/08
Heptachlor Epoxide	19	µg/Kg dry wt	13	EPA 8081A	06/17/08
Methoxychlor	<35	µg/Kg dry wt	35	EPA 8081A	06/17/08
Toxaphene	<830	µg/Kg dry wt	830	EPA 8081A	06/17/08
POLYCHLORINATED BIPHENYL CONGENERS -PACE					
Refer to Contract Report	Completed	ng/Kg dry wt		EPA 1668 MOD	07/28/08

End of Report for Sample ID: FO080755

Report Date: 08/21/08

Validated By: 

June 26, 2008

Analytical Report for Service Request No: K0805285

Jennifer Shackelford
Portland, City of
1120 SW Fifth Avenue # 1000
Portland, OR 97204

RE: Portland Harbor Stormwtr samp-outfall 22B sed trap

Dear Jennifer:

Enclosed are the results of the samples submitted to our laboratory on June 13, 2008. For your reference, these analyses have been assigned our service request number K0805285.

All analyses were performed according to our laboratory's quality assurance program. Where applicable, the methods cited conform to the Methods Update Rule (effective 4/11/2007), which relates to the use of analytical methods for the drinking water and waste water programs. The test results meet requirements of the NELAC standards. Exceptions are noted in the case narrative report where applicable. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3281. You may also contact me via Email at LVo@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Loan Vo, Ph.D.
Project Chemist

LV/lb

Page 1 of 17

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- B The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.
- * The duplicate analysis not within control limits. See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a chromatographic interference.
- X See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-

Case Narrative

COLUMBIA ANALYTICAL SERVICES, INC.

Client: City of Portland
Project: Portland Harbor Sormwater
Sample Matrix: Sediment

Service Request No.: K0805285
Date Received: 6/13/2008

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Control Sample (LCS).

Sample Receipt

Two sediment samples were received for analysis at Columbia Analytical Services on 6/13/2008. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Organochlorine Pesticides by EPA Method 8081A

Matrix Spike Recovery Exceptions:

The matrix spike recoveries of alpha-BHC, delta-BHC, and Endosulfan I for the Batch QC sample was outside control criteria. Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicates the analytical batch was in control. The matrix spike outlier suggests a potential low bias in this matrix. No further corrective action was appropriate.

The control criteria for the matrix spike recoveries of gamma-Chlordane, Endrin Ketone, Methoxychlor, and Toxaphene for sample Batch QC were not applicable. The chromatogram indicates non-target matrix background components are contributing to the reported matrix spike concentrations. Thus, the reported recoveries contain a high bias. Based on the magnitude of background contribution, the interference appears to be minimal. Also note the Method Reporting Limit (MRL) for the associated unspiked sample is elevated above the background level.

Sample Confirmation Notes:

The confirmation comparison criterion of 40% difference for a few analytes in both field samples. The higher of the two values was reported when both peaks were within the expected retention time window for this analysis and Gaussian in shape. The lower of the two values was reported when there was an apparent interference on the alternate column that produced the higher value.

Elevated Reporting Limits:

The MDL is elevated for beta-BHC and delta-BHC in Method Blank KWG0805653-8. The chromatogram indicated the presence of non-target background components, which were apparently introduced as laboratory artifacts. The contamination prevented adequate resolution of the target compounds at the MDL. Note the level of background was relatively low compared to the MDL, so the affect on the results was minimal. The results are flagged to indicate the problem.

The reporting limit is elevated for all analytes in both samples. The sample extract was diluted prior to instrumental analysis due to relatively high levels of non-target background components. The extract was highly colored and viscous, which indicated the need to perform a dilution prior to injection into the instrument. Clean-up of the extract was performed within the scope of the method, but did not eliminate enough of the background components to prevent dilution. The results are flagged to indicate the matrix interference.

Samples FO 080754 and FO 080755 required further dilution due to the presence of elevated levels of target analyte Dieldrin. The reporting limits are adjusted to reflect the dilution.

Approved by WST Date 6/30/08

Chain of Custody Documentation



60805285

PAGE () OF () COC # ()

PCOC: #1 06/03

Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form

PC LVO

Client / Project: City of Portland Service Request K08 5285
Received: 6/13/08 Opened: 6/13/08 By: du

1. Samples were received via? ☐ US Mail ☐ Fed Ex ☐ UPS ☐ DHL ☒ GH ☐ GS ☐ PDX ☒ Courier ☐ Hand Delivered
2. Samples were received in: (circle) ☒ Cooler ☐ Box ☐ Envelope ☒ Other ☐ NA
3. Were custody seals on coolers? ☒ NA ☐ Y ☐ N If yes, how many and where? _____
If present, were custody seals intact? ☐ Y ☐ N If present, were they signed and dated? ☐ Y ☐ N
4. Is shipper's air-bill filed? If not, record air-bill number: _____ NA ☐ Y ☐ N
5. Temperature of cooler(s) upon receipt (°C): _____
Temperature Blank (°C): _____
6. If applicable, list Chain of Custody Numbers: _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA ☒ Y ☐ N
8. Packing material used. ☐ Inserts ☐ Baggies ☐ Bubble Wrap ☐ Gel Packs ☐ Wet Ice ☐ Sleeves ☐ Other _____
9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA ☒ Y ☐ N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? ☒ Y ☐ N
11. Did all sample labels and tags agree with custody papers? Indicate in the table below ☒ Y ☐ N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA ☒ Y ☐ N
13. Were the pH-preserved bottles tested* received at the appropriate pH? Indicate in the table below ☒ NA ☐ Y ☐ N
14. Were VOA vials and 1631 Mercury bottles received without headspace? Indicate in the table below. ☒ NA ☐ Y ☐ N
15. Are CWA Microbiology samples received with >1/2 the 24hr. hold time remaining from collection? ☒ NA ☐ Y ☐ N
16. Was C12/Res negative? ☒ NA ☐ Y ☐ N

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broken	pH	Reagent	Volume added	Reagent Lot Number	Initials

*Does not include all pH preserved sample aliquots received. See sample receiving SOP (SMO-GEN).

Additional Notes, Discrepancies, & Resolutions: _____

Organochlorine Pesticides
EPA Method 8081

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwtr samp-outfall 22B sed trap
Sample Matrix: Sediment

Service Request: K0805285
Date Collected: 06/09/2008
Date Received: 06/13/2008

Organochlorine Pesticides

Sample Name: FO 080754
Lab Code: K0805285-001
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	8.9	JPD	12	3.0	5	06/17/08	06/21/08	KWG0805653	
beta-BHC	ND	Ui	44	44	5	06/17/08	06/21/08	KWG0805653	
gamma-BHC (Lindane)	ND	U	12	1.8	5	06/17/08	06/21/08	KWG0805653	
delta-BHC	ND	Ui	32	32	5	06/17/08	06/21/08	KWG0805653	
Heptachlor	21	PD	12	0.92	5	06/17/08	06/21/08	KWG0805653	
Aldrin	19	PD	12	1.8	5	06/17/08	06/21/08	KWG0805653	
Heptachlor Epoxide	22	D	12	1.5	5	06/17/08	06/21/08	KWG0805653	
gamma-Chlordane†	230	D	12	0.74	5	06/17/08	06/21/08	KWG0805653	
Endosulfan I	ND	Ui	14	14	5	06/17/08	06/21/08	KWG0805653	
alpha-Chlordane	150	D	12	2.7	5	06/17/08	06/21/08	KWG0805653	
Dieldrin	910	D	120	34	50	06/17/08	06/23/08	KWG0805653	
4,4'-DDE	48	PD	12	1.2	5	06/17/08	06/21/08	KWG0805653	
Endrin	66	D	12	2.3	5	06/17/08	06/21/08	KWG0805653	
Endosulfan II	ND	U	12	2.2	5	06/17/08	06/21/08	KWG0805653	
4,4'-DDD	180	PD	12	1.4	5	06/17/08	06/21/08	KWG0805653	
Endrin Aldehyde	ND	Ui	12	6.0	5	06/17/08	06/21/08	KWG0805653	
Endosulfan Sulfate	ND	Ui	82	82	5	06/17/08	06/21/08	KWG0805653	
4,4'-DDT	ND	Ui	110	110	5	06/17/08	06/21/08	KWG0805653	
Endrin Ketone	ND	Ui	12	12	5	06/17/08	06/21/08	KWG0805653	
Methoxychlor	ND	Ui	35	35	5	06/17/08	06/21/08	KWG0805653	
Toxaphene	ND	Ui	800	800	5	06/17/08	06/21/08	KWG0805653	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	77	25-125	06/21/08	Acceptable
Decachlorobiphenyl	115	22-142	06/21/08	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
 Project: Portland Harbor Stormwtr samp-outfall 22B sed trap
 Sample Matrix: Sediment

Service Request: K0805285
 Date Collected: 06/03/2008
 Date Received: 06/13/2008

Organochlorine Pesticides

Sample Name: FO 080755
 Lab Code: K0805285-002
 Extraction Method: EPA 3540C
 Analysis Method: 8081A

Units: ug/Kg
 Basis: Dry
 Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	8.2	JPD	13	3.3	5	06/17/08	06/21/08	KWG0805653	
beta-BHC	ND	Ui	35	35	5	06/17/08	06/21/08	KWG0805653	
gamma-BHC (Lindane)	ND	U	13	1.9	5	06/17/08	06/21/08	KWG0805653	
delta-BHC	81	PD	13	0.69	5	06/17/08	06/21/08	KWG0805653	
Heptachlor	ND	Ui	13	12	5	06/17/08	06/21/08	KWG0805653	
Aldrin	ND	U	13	1.9	5	06/17/08	06/21/08	KWG0805653	
Heptachlor Epoxide	19	D	13	1.7	5	06/17/08	06/21/08	KWG0805653	
gamma-Chlordane†	110	D	13	0.81	5	06/17/08	06/21/08	KWG0805653	
Endosulfan I	ND	Ui	13	13	5	06/17/08	06/21/08	KWG0805653	
alpha-Chlordane	94	D	13	2.9	5	06/17/08	06/21/08	KWG0805653	
Dieldrin	1200	D	130	37	50	06/17/08	06/23/08	KWG0805653	
4,4'-DDE	39	PD	13	1.3	5	06/17/08	06/21/08	KWG0805653	
Endrin	57	D	13	2.6	5	06/17/08	06/21/08	KWG0805653	
Endosulfan II	ND	U	13	2.4	5	06/17/08	06/21/08	KWG0805653	
4,4'-DDD	130	PD	13	1.6	5	06/17/08	06/21/08	KWG0805653	
Endrin Aldehyde	ND	Ui	13	9.3	5	06/17/08	06/21/08	KWG0805653	
Endosulfan Sulfate	ND	Ui	56	56	5	06/17/08	06/21/08	KWG0805653	
4,4'-DDT	ND	Ui	120	120	5	06/17/08	06/21/08	KWG0805653	
Endrin Ketone	ND	Ui	13	13	5	06/17/08	06/21/08	KWG0805653	
Methoxychlor	ND	Ui	35	35	5	06/17/08	06/21/08	KWG0805653	
Toxaphene	ND	Ui	830	830	5	06/17/08	06/21/08	KWG0805653	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	72	25-125	06/21/08	Acceptable
Decachlorobiphenyl	108	22-142	06/21/08	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Portland, City of
Project: Portland Harbor Stormwtr samp-outfall 22B sed trap
Sample Matrix: Sediment

Service Request: K0805285
Date Collected: NA
Date Received: NA

Organochlorine Pesticides

Sample Name: Method Blank
Lab Code: KWG0805653-8
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.50	0.26	1	06/17/08	06/20/08	KWG0805653	
beta-BHC	ND	Ui	0.50	0.50	1	06/17/08	06/20/08	KWG0805653	
gamma-BHC (Lindane)	ND	U	0.50	0.15	1	06/17/08	06/20/08	KWG0805653	
delta-BHC	ND	Ui	0.50	0.34	1	06/17/08	06/20/08	KWG0805653	
Heptachlor	ND	U	0.50	0.080	1	06/17/08	06/20/08	KWG0805653	
Aldrin	ND	U	0.50	0.15	1	06/17/08	06/20/08	KWG0805653	
Heptachlor Epoxide	ND	U	0.50	0.13	1	06/17/08	06/20/08	KWG0805653	
gamma-Chlordane†	ND	U	0.50	0.064	1	06/17/08	06/20/08	KWG0805653	
Endosulfan I	ND	U	0.50	0.17	1	06/17/08	06/20/08	KWG0805653	
alpha-Chlordane	ND	U	0.50	0.23	1	06/17/08	06/20/08	KWG0805653	
Dieldrin	ND	U	0.50	0.29	1	06/17/08	06/20/08	KWG0805653	
4,4'-DDE	ND	U	0.50	0.10	1	06/17/08	06/20/08	KWG0805653	
Endrin	ND	U	0.50	0.20	1	06/17/08	06/20/08	KWG0805653	
Endosulfan II	ND	U	0.50	0.19	1	06/17/08	06/20/08	KWG0805653	
4,4'-DDD	ND	U	0.50	0.12	1	06/17/08	06/20/08	KWG0805653	
Endrin Aldehyde	ND	U	0.50	0.053	1	06/17/08	06/20/08	KWG0805653	
Endosulfan Sulfate	ND	U	0.50	0.079	1	06/17/08	06/20/08	KWG0805653	
4,4'-DDT	ND	U	0.50	0.064	1	06/17/08	06/20/08	KWG0805653	
Endrin Ketone	ND	U	0.50	0.082	1	06/17/08	06/20/08	KWG0805653	
Methoxychlor	ND	U	0.50	0.10	1	06/17/08	06/20/08	KWG0805653	
Toxaphene	ND	U	25	9.2	1	06/17/08	06/20/08	KWG0805653	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	82	25-125	06/20/08	Acceptable
Decachlorobiphenyl	96	22-142	06/20/08	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwtr samp-outfall 22B sed trap
Sample Matrix: Sediment

Service Request: K0805285

Surrogate Recovery Summary
Organochlorine Pesticides

Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: PERCENT
Level: Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
FO 080754	K0805285-001	77 D	115 D
FO 080755	K0805285-002	72 D	108 D
Method Blank	KWG0805653-8	82	96
Batch QC	K0805292-012	65	84
Batch QC	K0805292-013	65	97
Batch QCMS	KWG0805653-2	65	82
Batch QCDMS	KWG0805653-3	63	80
Batch QCMS	KWG0805653-5	67	93
Batch QCDMS	KWG0805653-6	66	88
Lab Control Sample	KWG0805653-4	83	99

Surrogate Recovery Control Limits (%)

Sur1 = Tetrachloro-m-xylene	25-125
Sur2 = Decachlorobiphenyl	22-142

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwtr samp-outfall 22B sed trap
Sample Matrix: Sediment

Service Request: K0805285
Date Extracted: 06/17/2008
Date Analyzed: 06/20/2008 -
 06/21/2008

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K0805292-012
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0805653

Analyte Name	Sample Result	Batch QCMS KWG0805653-2 Matrix Spike			Batch QCDMS KWG0805653-3 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
alpha-BHC	1.7	8.30	19.6	33 *	7.03	19.6	27 *	36-145	17	40
beta-BHC	ND	13.0	19.6	66	12.6	19.6	64	38-148	3	40
gamma-BHC (Lindane)	0.45	10.0	19.6	49	10.5	19.6	51	33-154	5	40
delta-BHC	ND	7.08	19.6	36 *	8.69	19.6	44	40-164	20	40
Heptachlor	ND	10.3	19.6	52	11.1	19.6	57	38-145	8	40
Aldrin	ND	12.1	19.6	62	11.7	19.6	60	37-143	3	40
Heptachlor Epoxide	3.0	13.9	19.6	56	13.4	19.6	53	29-150	3	40
gamma-Chlordane	ND	19.0	19.6	97 #	18.9	19.6	96 #	27-149	0	40
Endosulfan I	ND	1.74	19.6	9 *	1.68	19.6	9 *	18-133	3	40
alpha-Chlordane	ND	14.4	19.6	73	14.4	19.6	73	33-141	0	40
Dieldrin	ND	12.6	19.6	64	11.8	19.6	60	37-146	7	40
4,4'-DDE	24	37.0	19.6	65	37.5	19.6	68	32-156	2	40
Endrin	0.64	13.0	19.6	63	12.8	19.6	62	34-161	2	40
Endosulfan II	ND	4.06	19.6	21	4.09	19.6	21	19-147	1	40
4,4'-DDD	7.3	21.2	19.6	71	20.9	19.6	69	26-161	2	40
Endrin Aldehyde	ND	10.1	19.6	52	10.0	19.6	51	11-147	1	40
Endosulfan Sulfate	ND	10.9	19.6	55	10.3	19.6	52	28-149	6	40
4,4'-DDT	19	25.0	19.6	32	32.8	19.6	72	22-174	27	40
Endrin Ketone	ND	11.1	19.6	57 #	10.4	19.6	53 #	36-149	7	40
Methoxychlor	ND	14.9	19.6	76 #	13.8	19.6	71 #	37-162	8	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwtr samp-outfall 22B sed trap
Sample Matrix: Sediment

Service Request: K0805285
Date Extracted: 06/17/2008
Date Analyzed: 06/21/2008

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides

Sample Name: Batch QC
Lab Code: K0805292-013
Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0805653

Analyte Name	Sample Result	Batch QCMS KWG0805653-5 Matrix Spike			Batch QCDMS KWG0805653-6 Duplicate Matrix Spike			%Rec Limits	RPD	RPD Limit
		Result	Expected	%Rec	Result	Expected	%Rec			
Toxaphene	ND	149	201	74 #	137	201	68 #	10-184	9	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Portland, City of
Project: Portland Harbor Stormwtr samp-outfall 22B sed trap
Sample Matrix: Sediment

Service Request: K0805285
Date Extracted: 06/17/2008
Date Analyzed: 06/20/2008

Lab Control Spike Summary
Organochlorine Pesticides

Extraction Method: EPA 3540C
Analysis Method: 8081A

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0805653

Lab Control Sample
KWG0805653-4
Lab Control Spike

Analyte Name	Result	Expected	%Rec	%Rec Limits
alpha-BHC	18.4	20.0	92	45-150
beta-BHC	22.0	20.0	110	47-149
gamma-BHC (Lindane)	18.6	20.0	93	48-146
delta-BHC	20.8	20.0	104	59-162
Heptachlor	17.5	20.0	88	47-142
Aldrin	18.3	20.0	91	43-141
Heptachlor Epoxide	18.7	20.0	94	48-140
gamma-Chlordane	19.1	20.0	95	42-145
Endosulfan I	16.0	20.0	80	36-124
alpha-Chlordane	19.0	20.0	95	42-145
Dieldrin	20.2	20.0	101	50-142
4,4'-DDE	19.9	20.0	99	51-149
Endrin	19.9	20.0	100	54-155
Endosulfan II	18.4	20.0	92	42-130
4,4'-DDD	20.2	20.0	101	51-152
Endrin Aldehyde	19.0	20.0	95	31-139
Endosulfan Sulfate	20.1	20.0	100	48-143
4,4'-DDT	20.7	20.0	103	59-151
Endrin Ketone	20.6	20.0	103	41-158
Methoxychlor	19.7	20.0	98	55-153
Toxaphene	215	200	107	37-155

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Report Prepared for:

Howard Holmes
Test America
9405 SW Nimbus Avenue
Beaverton OR 97008

**REPORT OF
LABORATORY
ANALYSIS
FOR PCBs**

Report Prepared Date:

August 6, 2008

Report Information:

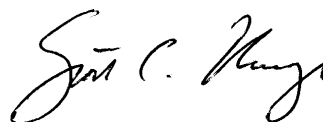
Pace Project #: 1075280
Sample Receipt Date: 06/17/2008
Client Project #: PFR0541
Client Sub PO #: N/A
State Cert #: MN200001-004

Invoicing & Reporting Options:

The report provided has been invoiced as a Level 2 PCB Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Scott Unze, your Pace Project Manager.

This report has been reviewed and prepared by:



Scott Unze, Project Manager
(612) 607-6383
(612) 607-6444 (fax)
scott.unze@pacelabs.com



Report of Laboratory Analysis

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The results relate only to the samples included in this report.

DISCUSSION

This report presents the results from the analyses performed on two samples submitted by a representative of Test America - Portland. The samples were analyzed for the presence or absence of polychlorinated biphenyl (PCB) congeners using USEPA Method 1668A. Reporting limits were set to approximately 100 parts per trillion and were adjusted for sample volume.

The isotopically-labeled PCB internal standards in the sample extracts were recovered at 9-154%. With three exceptions, the labeled internal standard recoveries obtained for this project were within the target ranges specified in the method. Since the quantification of the native PCB congeners was based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained. The samples were analyzed at a dilution due to matrix components that remained in the sample extract after sample processing. Analyte levels exhibiting isotope ratios outside of the acceptance ranges were flagged "I" on the results tables.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results show the blank to contain low levels of several PCB congeners. The samples contained these analytes at levels over ten times the levels present in the method blank. In general, levels less than ten times the background are not considered statistically different from the background. This indicates that the analytical process did not introduce significant levels of PCB congeners to the sample extracts.

Laboratory spike samples were also prepared with the sample batch using reference material that had been fortified with native standards. The results show that the spiked native compounds in the lab spike were recovered at 84-119% with relative percent differences of 0.0-16.4%. These results indicate high degrees of accuracy and precision for these determinations. Matrix spikes were not prepared with the sample set.

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

SUBCONTRACT ORDER

TestAmerica Portland

PRF0541

1075280

SENDING LABORATORY:

TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Phone: (503) 906-9200
Fax: (503) 906-9210
Project Manager: Howard Holmes

RECEIVING LABORATORY:

Pace Analytical Services, Inc - Minneapolis
1700 Elm Street Suite 200
Minneapolis, MN 55414
Phone: (612) 607-1700
Fax: (612) 607-6444
Project Location:
Receipt Temperature: °C Ice: Y / N

Analysis	Units	Due	Expires	Comments
Sample ID: PRF0541-01	Other wet		Sampled: 06/09/08 14:03	001
1668 Coplanar PCBs - SUB	ug/l	06/26/08	12/06/08 14:03	***209 Congeners*** to Pace
Containers Supplied:				
4 oz. jar (B)				F0 080754
Sample ID: PRF0541-02	Other wet		Sampled: 06/03/08 15:12	002
1668 Coplanar PCBs - SUB	ug/l	06/26/08	11/30/08 15:12	***209 Congeners*** to Pace
Containers Supplied:				
4 oz. jar (B)				F0 080755

Jamie Finkel
Released By

6/16/08 14:40
Date/Time

Pace
Received By

6/17/08 9:12
Date/Time

Temp
1.6°C

Released By

Date/Time

Received By
4 of 30

Date/Time

Page 1 of 1
Report No.....1075280_1668A



Sample Condition Upon Receipt

Client Name: Test AmericanProject # 1075280Courier: ☐ Fed Ex ☐ UPS ☒ USPS ☐ Client ☐ Commercial ☐ Pace Other _____Tracking #: 121AE 58764216 6642Custody Seal on Cooler/Box Present: ☒ Yes ☐ No Seals Intact: ☒ Yes ☐ NoPacking Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____Thermometer Used 230194010-72310129Type of Ice: Wet Blue None☐ Samples on ice, cooling process has begunCooler Temperature 1.6°C

Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 6/17/08

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☒ Yes ☐ No ☐ N/A	1.
Chain of Custody Filled Out:	☒ Yes ☐ No ☐ N/A	2.
Chain of Custody Relinquished:	☒ Yes ☐ No ☐ N/A	3.
Sampler Name & Signature on COC:	☐ Yes ☒ No ☐ N/A	4.
Samples Arrived within Hold Time:	☒ Yes ☐ No ☐ N/A	5.
Short Hold Time Analysis (<72hr):	☐ Yes ☒ No ☐ N/A	6.
Rush Turn Around Time Requested:	☐ Yes ☒ No ☐ N/A	7.
Sufficient Volume:	☒ Yes ☐ No ☐ N/A	8.
Correct Containers Used:	☒ Yes ☐ No ☐ N/A	9.
-Pace Containers Used:	☐ Yes ☒ No ☐ N/A	
Containers Intact:	☒ Yes ☐ No ☐ N/A	10.
Filtered volume received for Dissolved tests	☐ Yes ☐ No ☒ N/A	11. <u>16 (7-5)</u>
Sample Labels match COC:	☒ Yes ☐ No ☒ N/A	12.
-Includes date/time/ID/Analysis Matrix:	<u>50:1</u>	
All containers needing preservation have been checked.	☐ Yes ☐ No ☒ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐ Yes ☐ No ☒ N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐ Yes ☒ No	Initial when completed
		Lot # of added preservative
Samples checked for dechlorination:	☐ Yes ☐ No ☒ N/A	14.
Headspace in VOA Vials (>6mm):	☐ Yes ☐ No ☒ N/A	15.
Trip Blank Present:	☐ Yes ☐ No ☒ N/A	16.
Trip Blank Custody Seals Present	☐ Yes ☐ No ☒ N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: (Signature)Date: 06/17/08

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Appendix B

Sample Analysis Summary



Pace AnalyticalTM

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - Test America

Client's Sample ID	PRF0541-01;FO 080754		
Lab Sample ID	1075280001-R		
Filename	P80802A_12		
Injected By	BAL		
Total Amount Extracted	23.4 g	Matrix	Solid
% Moisture	78.2	Dilution	5
Dry Weight Extracted	5.11 g	Collected	06/09/2008
ICAL ID	P80802A08	Received	06/17/2008
CCal Filename(s)	P80802A_07	Extracted	07/28/2008
Method Blank ID	BLANK-17076	Analyzed	08/03/2008 03:23

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery	
Labeled Analytes							
13C-2-MoCB	1	7.912	2.03	2.0	0.225	13	IP
13C-4-MoCB	3	11.195	2.92	2.0	0.976	49	
13C-2,2'-DiCB	4	11.543	1.74	2.0	0.545	27	
13C-4,4'-DiCB	15	19.630	1.34	2.0	1.52	76	
13C-2,2',6-TrCB	19	15.916	1.13	2.0	1.04	52	
13C-3,4,4'-TrCB	37	27.993	1.08	2.0	1.54	77	
13C-2,2',6,6'-TeCB	54	19.927	0.78	2.0	1.29	65	
13C-3,4,4',5-TeCB	81	35.421	0.87	2.0	1.05	52	
13C-3,3',4,4'-TeCB	77	36.008	0.78	2.0	1.05	52	
13C-2,2',4,6,6'-PeCB	104	26.568	1.67	2.0	1.61	81	
13C-2,3,3',4,4'-PeCB	105	39.698	1.49	2.0	0.955	48	
13C-2,3,4,4',5-PeCB	114	39.027	1.42	2.0	0.946	47	
13C-2,3',4,4',5-PeCB	118	38.490	1.44	2.0	1.04	52	
13C-2,3',4,4',5'-PeCB	123	38.138	1.50	2.0	1.09	54	
13C-3,3',4,4',5-PeCB	126	42.934	1.45	2.0	0.825	41	
13C-2,2',4,4',6,6'-HxCB	155	32.923	1.36	2.0	2.30	115	
13C-HxCB (156/157)	156/157	46.036	1.08	4.0	2.03	51	
13C-2,3',4,4',5,5'-HxCB	167	44.879	1.23	2.0	1.17	58	
13C-3,3',4,4',5,5'-HxCB	169	49.390	1.32	2.0	0.996	50	
13C-2,2',3,4',5,6,6'-HpCB	188	38.993	1.17	2.0	3.08	154	P
13C-2,3,3',4,4',5,5'-HpCB	189	51.943	1.18	2.0	1.44	72	
13C-2,2',3,3',5,5',6,6'-OxCB	202	44.561	0.95	2.0	2.16	108	
13C-2,3,3',4,4',5,5',6-OxCB	205	54.508	0.96	2.0	1.40	70	
13C-2,2',3,3',4,4',5,5',6-NoCB	206	56.232	0.80	2.0	1.71	85	
13C-2,2',3,3',4,4',5,5',6-NoCB	208	51.383	0.78	2.0	1.76	88	
13C--DeCB	209	57.827	0.62	2.0	1.49	74	
Cleanup Standards							
13C-2,4,4'-TrCB	28	23.365	1.11	2.0	1.39	70	
13C-2,3,3',5,5'-PeCB	111	36.092	1.61	2.0	1.31	66	
13C-2,2',3,3',5,5',6-HpCB	178	42.179	1.12	2.0	1.75	87	
Recovery Standards							
13C-2,5-DiCB	9	14.418	1.58	2.0	NA	NA	
13C-2,2',5,5'-TeCB	52	25.511	0.82	2.0	NA	NA	
13C-2,2',4,5,5'-PeCB	101	33.175	1.62	2.0	NA	NA	
13C-2,2',3,4,4',5'-HxCB	138	41.710	1.17	2.0	NA	NA	
13C-2,2',3,3',4,4',5,5'-OxCB	194	54.034	1.10	2.0	NA	NA	I

Conc = Concentration
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P = Recovery outside of Method 1668A control limits
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Results reported on a dry weight basis

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
! = Outside QC Limits
RT = Retention Time
I = Interference
ng's = Nanograms

REPORT OF LABORATORY ANALYSIS

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Pace AnalyticalTM

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

**Method 1668A Polychlorobiphenyl
Sample Analysis Results**

Client Sample ID PRF0541-01;FO 080754
Lab Sample ID 1075280001-R
Filename P80802A_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		7.936	2.68	1250	---	97.8
2		10.956	2.69	632	---	97.8
3		11.219	2.89	1510	---	97.8
4		11.555	1.47	13100	---	97.8
5		15.377	1.27 I	---	630	97.8
6		14.994	1.49	9860	---	97.8
7		14.670	1.41	2090	---	97.8
8		15.581	1.44	46600	---	97.8
9		14.442	1.36	3110	---	97.8
10		11.818	1.19 I	---	462	97.8
11		18.876	1.45	15800	---	117
12	12/13	19.235	1.33	2810	---	97.8
13	12/13	19.235	1.33	(2810)	---	97.8
14		---	---	ND	---	97.8
15		19.642	1.45	13600	---	97.8
16		19.534	1.04	19900	---	97.8
17		18.983	1.04	23200	---	97.8
18	18/30	18.456	1.04	47700	---	97.8
19		15.940	1.03	4780	---	97.8
20	20/28	23.382	0.98	57400	---	117
21	21/33	23.650	1.00	36100	---	97.8
22		24.103	0.97	23100	---	97.8
23		22.007	1.18	103	---	97.8
24		---	---	ND	---	97.8
25		22.661	0.97	4260	---	97.8
26	26/29	22.376	0.99	10500	---	97.8
27		19.247	1.05	3400	---	97.8
28	20/28	23.382	0.98	(57400)	---	117
29	26/29	22.376	0.99	(10500)	---	97.8
30	18/30	18.456	1.04	(47700)	---	97.8
31		23.030	0.99	48400	---	97.8
32		20.229	0.99	13400	---	97.8
33	21/33	23.650	1.00	(36100)	---	97.8
34		21.839	0.95	204	---	97.8
35		27.574	1.04	970	---	97.8
36		26.115	0.93	543	---	97.8
37		28.027	1.00	11000	---	97.8
38		---	---	ND	---	97.8
39		26.417	0.91	229	---	97.8
40	40/41/71	27.792	0.77	27200	---	97.8
41	40/41/71	27.792	0.77	(27200)	---	97.8
42		27.255	0.76	11300	---	97.8
43		25.813	0.78	1640	---	97.8
44	44/47/65	26.668	0.77	37200	---	117
45	45/51	23.449	0.76	10300	---	97.8
46		23.801	0.75	3430	---	97.8
47	44/47/65	26.668	0.77	(37200)	---	117
48		26.417	0.77	11100	---	97.8

Conc = Concentration

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B = Less than 10 times higher than method blank level

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Pace AnalyticalTM

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl Sample Analysis Results

Client Sample ID PRF0541-01;FO 080754
Lab Sample ID 1075280001-R
Filename P80802A_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	26.115	0.76	24600	---	97.8
50	50/53	22.661	0.77	6950	---	97.8
51	45/51	23.449	0.76	(10300)	---	97.8
52		25.545	0.76	44300	---	97.8
53	50/53	22.661	0.77	(6950)	---	97.8
54		19.961	0.89	113	---	97.8
55		---	---	ND	---	97.8
56		32.017	0.74	8350	---	97.8
57		29.938	0.75	913	---	97.8
58		---	---	ND	---	97.8
59	59/62/75	27.037	0.81	4070	---	97.8
60		32.252	0.75	4860	---	97.8
61	61/70/74/76	30.961	0.75	40000	---	97.8
62	59/62/75	27.037	0.81	(4070)	---	97.8
63		30.592	0.75	1000	---	97.8
64		28.077	0.75	18500	---	97.8
65	44/47/65	26.668	0.77	(37200)	---	117
66		31.313	0.75	18100	---	97.8
67		30.307	0.77	1030	---	97.8
68		29.402	0.80	106	---	97.8
69	49/69	26.115	0.76	(24600)	---	97.8
70	61/70/74/76	30.961	0.75	(40000)	---	97.8
71	40/41/71	27.792	0.77	(27200)	---	97.8
72		29.083	0.76	180	---	97.8
73		---	---	ND	---	97.8
74	61/70/74/76	30.961	0.75	(40000)	---	97.8
75	59/62/75	27.037	0.81	(4070)	---	97.8
76	61/70/74/76	30.961	0.75	(40000)	---	97.8
77		36.025	0.77	1870	---	97.8
78		35.103	0.94 I	---	104	97.8
79		34.399	0.74	612	---	97.8
80		---	---	ND	---	97.8
81		---	---	ND	---	97.8
82		35.589	1.55	5160	---	97.8
83		33.661	1.68	1960	---	97.8
84		31.112	1.55	10700	---	97.8
85	85/116/117	35.103	1.54	6160	---	117
86	86/87/97/108/119/125	34.399	1.57	28000	---	196
87	86/87/97/108/119/125	34.399	1.57	(28000)	---	196
88	88/91	30.894	1.55	6090	---	97.8
89		31.649	1.50	565	---	97.8
90	90/101/113	33.208	1.57	39400	---	97.8
91	88/91	30.894	1.55	(6090)	---	97.8
92		32.571	1.55	6300	---	97.8
93	93/98/100/102	30.341	1.55	1940	---	147
94		29.452	1.36	274	---	97.8
95		29.938	1.57	33100	---	97.8
96		26.970	1.78	482	---	97.8

Conc = Concentration

EML =Method Specified Reporting Limit (1668A)

EMPC = Estimated Maximum Possible Concentration

A = Limit of Detection based on signal to noise

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P = Recovery outside of Method 1668A control limits

Nn = Value obtained from additional analyses

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ND = Not Detected

NA = Not Applicable

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1700 Elm Street - Suite 200
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Tel: 612-607-1700
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**Method 1668A Polychlorobiphenyl
Sample Analysis Results**

Client Sample ID PRF0541-01;FO 080754
Lab Sample ID 1075280001-R
Filename P80802A_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	34.399	1.57	(28000)	---	196
98	93/98/100/102	30.341	1.55	(1940)	---	147
99		33.828	1.55	18500	---	97.8
100	93/98/100/102	30.341	1.55	(1940)	---	147
101	90/101/113	33.208	1.57	(39400)	---	97.8
102	93/98/100/102	30.341	1.55	(1940)	---	147
103		29.251	1.48	207	---	97.8
104		---	---	ND	---	97.8
105		39.714	1.52	13400	---	97.8
106		---	---	ND	---	97.8
107	107/124	37.786	1.44	1120	---	97.8
108	86/87/97/108/119/125	34.399	1.57	(28000)	---	196
109		38.037	1.51	1860	---	97.8
110	110/115	35.287	1.56	45900	---	97.8
111		36.294	1.41	399	---	97.8
112		---	---	ND	---	97.8
113	90/101/113	33.208	1.57	(39400)	---	97.8
114		39.044	1.54	723	---	97.8
115	110/115	35.287	1.56	(45900)	---	97.8
116	85/116/117	35.103	1.54	(6160)	---	117
117	85/116/117	35.103	1.54	(6160)	---	117
118		38.507	1.51	29000	---	97.8
119	86/87/97/108/119/125	34.399	1.57	(28000)	---	196
120		---	---	ND	---	97.8
121		---	---	ND	---	97.8
122		38.842	1.13 I	---	310	97.8
123		38.172	1.48	443	---	97.8
124	107/124	37.786	1.44	(1120)	---	97.8
125	86/87/97/108/119/125	34.399	1.57	(28000)	---	196
126		43.001	1.32	500	---	97.8
127		---	---	ND	---	97.8
128	128/166	43.018	1.25	6310	---	196
129	129/138/163	41.743	1.22	41900	---	97.8
130		41.073	1.24	2230	---	97.8
131		38.088	1.25	635	---	97.8
132		38.541	1.23	16000	---	97.8
133		39.144	1.18	459	---	97.8
134	134/143	37.451	1.31	2100	---	97.8
135	135/151	36.277	1.25	15900	---	99.8
136		33.644	1.24	6730	---	97.8
137		41.307	1.22	2160	---	97.8
138	129/138/163	41.743	1.22	(41900)	---	97.8
139	139/140	37.887	1.27	704	---	97.8
140	139/140	37.887	1.27	(704)	---	97.8
141		40.653	1.31	7380	---	97.8
142		---	---	ND	---	97.8
143	134/143	37.451	1.31	(2100)	---	97.8
144		36.880	1.25	2470	---	97.8

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Pace AnalyticalTM

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
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**Method 1668A Polychlorobiphenyl
Sample Analysis Results**

Client Sample ID PRF0541-01;FO 080754
Lab Sample ID 1075280001-R
Filename P80802A_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	97.8
146		39.832	1.22	4870	---	97.8
147	147/149	37.249	1.22	38200	---	97.8
148		---	---	ND	---	97.8
149	147/149	37.249	1.22	(38200)	---	97.8
150		---	---	ND	---	97.8
151	135/151	36.277	1.25	(15900)	---	99.8
152		---	---	ND	---	97.8
153	153/168	40.469	1.19	32500	---	117
154		36.579	1.31	356	---	97.8
155		---	---	ND	---	97.8
156	156/157	46.053	1.22	5520	---	97.8
157	156/157	46.053	1.22	(5520)	---	97.8
158		42.163	1.24	3810	---	97.8
159		44.007	1.22	440	---	97.8
160		---	---	ND	---	97.8
161		---	---	ND	---	97.8
162		44.443	1.12	324	---	97.8
163	129/138/163	41.743	1.22	(41900)	---	97.8
164		41.425	1.26	2300	---	97.8
165		---	---	ND	---	97.8
166	128/166	43.018	1.25	(6310)	---	196
167		44.896	1.17	1300	---	97.8
168	153/168	40.469	1.19	(32500)	---	117
169		---	---	ND	---	97.8
170		48.736	1.01	7660	---	97.8
171	171/173	45.097	1.05	2780	---	97.8
172		46.808	1.01	1470	---	97.8
173	171/173	45.097	1.05	(2780)	---	97.8
174		43.990	1.02	11400	---	97.8
175		42.867	0.99	577	---	97.8
176		40.268	1.02	1740	---	97.8
177		44.443	1.02	5010	---	97.8
178		42.213	1.09	2660	---	97.8
179		39.329	1.07	6490	---	97.8
180	180/193	47.478	1.02	21100	---	97.8
181		---	---	ND	---	97.8
182		---	---	ND	---	97.8
183	183/185	43.789	1.00	8050	---	97.8
184		---	---	ND	---	97.8
185	183/185	43.789	1.00	(8050)	---	97.8
186		---	---	ND	---	97.8
187		43.152	1.06	17300	---	97.8
188		---	---	ND	---	97.8
189		51.965	1.03	414	---	97.8
190		49.289	0.96	1580	---	97.8
191		47.847	1.10	330	---	97.8
192		---	---	ND	---	97.8

Conc = Concentration

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Pace AnalyticalTM

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

**Method 1668A Polychlorobiphenyl
Sample Analysis Results**

Client Sample ID PRF0541-01;FO 080754
Lab Sample ID 1075280001-R
Filename P80802A_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.478	1.02	(21100)	---	97.8
194		54.055	0.88	6250	---	97.8
195		51.641	0.85	2490	---	97.8
196		50.111	0.91	4940	---	137
197	197/200	46.522	0.92	1880	---	489
198	198/199	49.457	0.88	12000	---	97.8
199	198/199	49.457	0.88	(12000)	---	97.8
200	197/200	46.522	0.92	(1880)	---	489
201		45.533	0.88	1760	---	97.8
202		44.577	0.89	2150	---	97.8
203		50.329	0.90	7280	---	97.8
204		---	---	ND	---	97.8
205		54.551	1.04 I	---	358	97.8
206		56.275	0.78	6110	---	97.8
207		52.353	0.83	801	---	97.8
208		51.404	0.78	2130	---	97.8
209		57.849	0.71	4820	---	97.8

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client Sample ID PRF0541-01;FO 080754
Lab Sample ID 1075280001-R
Filename P80802A_12

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	3380
Total Dichloro Biphenyls	107000
Total Trichloro Biphenyls	305000
Total Tetrachloro Biphenyls	278000
Total Pentachloro Biphenyls	252000
Total Hexachloro Biphenyls	195000
Total Heptachloro Biphenyls	88500
Total Octachloro Biphenyls	38700
Total Nonachloro Biphenyls	9050
Decachloro Biphenyls	4820
Total PCBs	1280000

ND = Not Detected

Results reported on a dry weight basis

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - Test America

Client's Sample ID	PRF0541-02;FO 080755		
Lab Sample ID	1075280002-R		
Filename	P80802A_13		
Injected By	BAL		
Total Amount Extracted	21.3 g	Matrix	Solid
% Moisture	80.1	Dilution	5
Dry Weight Extracted	4.24 g	Collected	06/03/2008
ICAL ID	P80802A08	Received	06/17/2008
CCal Filename(s)	P80802A_07	Extracted	07/28/2008
Method Blank ID	BLANK-17076	Analyzed	08/03/2008 04:25

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery	
Labeled Analytes							
13C-2-MoCB	1	7.972	2.58	2.0	0.165	9	IP
13C-4-MoCB	3	11.266	2.89	2.0	0.994	50	
13C-2,2'-DiCB	4	11.602	1.61	2.0	0.570	29	
13C-4,4'-DiCB	15	19.677	1.48	2.0	1.76	88	
13C-2,2',6-TrCB	19	15.975	1.18	2.0	1.06	53	
13C-3,4,4'-TrCB	37	28.059	1.08	2.0	1.69	85	
13C-2,2',6,6'-TeCB	54	19.993	0.84	2.0	1.38	69	
13C-3,4,4',5-TeCB	81	35.487	0.78	2.0	1.09	55	
13C-3,3',4,4'-TeCB	77	36.074	0.76	2.0	1.05	53	
13C-2,2',4,6,6'-PeCB	104	26.617	1.57	2.0	1.75	87	
13C-2,3,3',4,4'-PeCB	105	39.763	1.63	2.0	1.02	51	
13C-2,3,4,4',5-PeCB	114	39.093	1.51	2.0	0.977	49	
13C-2,3',4,4',5-PeCB	118	38.556	1.47	2.0	1.06	53	
13C-2,3',4,4',5'-PeCB	123	38.204	1.64	2.0	1.12	56	
13C-3,3',4,4',5-PeCB	126	43.033	1.34	2.0	1.01	51	
13C-2,2',4,4',6,6'-HxCB	155	32.972	1.35	2.0	2.51	125	
13C-HxCB (156/157)	156/157	46.135	1.29	4.0	2.46	62	
13C-2,3',4,4',5,5'-HxCB	167	44.978	1.25	2.0	1.38	69	
13C-3,3',4,4',5,5'-HxCB	169	49.506	1.08	2.0	1.17	58	
13C-2,2',3,4',5,6,6'-HpCB	188	39.059	1.06	2.0	2.37	118	
13C-2,3,3',4,4',5,5'-HpCB	189	52.071	1.05	2.0	1.55	78	
13C-2,2',3,3',5,5',6,6'-OxCB	202	44.643	0.89	2.0	2.02	101	
13C-2,3,3',4,4',5,5',6-OxCB	205	54.657	1.02	2.0	1.45	73	
13C-2,2',3,3',4,4',5,5',6-NoCB	206	56.381	0.78	2.0	1.62	81	
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.489	0.76	2.0	1.77	88	
13C--DeCB	209	57.976	0.60	2.0	1.64	82	
Cleanup Standards							
13C-2,4,4'-TrCB	28	23.414	1.07	2.0	1.77	88	
13C-2,3,3',5,5'-PeCB	111	36.158	1.59	2.0	1.37	69	
13C-2,2',3,3',5,5',6-HpCB	178	42.262	1.08	2.0	1.87	94	
Recovery Standards							
13C-2,5-DiCB	9	14.477	1.48	2.0	NA	NA	
13C-2,2',5,5'-TeCB	52	25.577	0.79	2.0	NA	NA	
13C-2,2',4,5,5'-PeCB	101	33.240	1.58	2.0	NA	NA	
13C-2,2',3,4,4',5'-HxCB	138	41.792	1.26	2.0	NA	NA	
13C-2,2',3,3',4,4',5,5'-OxCB	194	54.183	0.93	2.0	NA	NA	

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Tel: 612-607-1700
Fax: 612- 607-6444

**Method 1668A Polychlorobiphenyl
Sample Analysis Results**

Client Sample ID PRF0541-02;FO 080755
Lab Sample ID 1075280002-R
Filename P80802A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		7.984	2.70	1300	---	118
2		11.015	2.68	612	---	118
3		11.278	2.86	1430	---	118
4		11.614	1.54	12000	---	118
5		15.436	1.45	594	---	118
6		15.052	1.45	8960	---	118
7		14.729	1.35	1840	---	118
8		15.639	1.48	42700	---	118
9		14.501	1.44	2890	---	118
10		11.889	1.64	368	---	118
11		18.934	1.43	16000	---	142
12	12/13	19.294	1.39	3170	---	118
13	12/13	19.294	1.39	(3170)	---	118
14		---	---	ND	---	118
15		19.701	1.45	14000	---	118
16		19.593	1.06	20800	---	118
17		19.042	1.04	23900	---	118
18	18/30	18.515	1.05	48100	---	118
19		15.999	1.07	5110	---	118
20	20/28	23.448	1.00	63100	---	142
21	21/33	23.716	1.00	40200	---	118
22		24.169	0.99	25000	---	118
23		22.073	1.13	123	---	118
24		---	---	ND	---	118
25		22.727	0.98	4820	---	118
26	26/29	22.442	0.99	12000	---	118
27		19.306	1.04	3580	---	118
28	20/28	23.448	1.00	(63100)	---	142
29	26/29	22.442	0.99	(12000)	---	118
30	18/30	18.515	1.05	(48100)	---	118
31		23.095	0.98	54100	---	118
32		20.295	0.98	15200	---	118
33	21/33	23.716	1.00	(40200)	---	118
34		21.888	1.03	230	---	118
35		27.640	0.96	1060	---	118
36		26.164	1.08	483	---	118
37		28.092	0.99	11800	---	118
38		---	---	ND	---	118
39		26.483	1.15	211	---	118
40	40/41/71	27.841	0.77	27300	---	118
41	40/41/71	27.841	0.77	(27300)	---	118
42		27.304	0.76	11400	---	118
43		25.862	0.79	1810	---	118
44	44/47/65	26.717	0.77	37900	---	142
45	45/51	23.515	0.77	10900	---	118
46		23.850	0.77	3640	---	118
47	44/47/65	26.717	0.77	(37900)	---	142
48		26.483	0.77	11500	---	118

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

**Method 1668A Polychlorobiphenyl
Sample Analysis Results**

Client Sample ID PRF0541-02;FO 080755
Lab Sample ID 1075280002-R
Filename P80802A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	26.164	0.77	25300	---	118
50	50/53	22.710	0.76	7380	---	118
51	45/51	23.515	0.77	(10900)	---	118
52		25.611	0.77	45500	---	118
53	50/53	22.710	0.76	(7380)	---	118
54		---	---	ND	---	118
55		---	---	ND	---	118
56		32.083	0.76	8180	---	118
57		29.904	0.80	202	---	118
58		30.004	0.80	770	---	118
59	59/62/75	27.086	0.77	4170	---	118
60		32.318	0.76	4660	---	118
61	61/70/74/76	31.027	0.75	40800	---	118
62	59/62/75	27.086	0.77	(4170)	---	118
63		30.658	0.78	945	---	118
64		28.126	0.78	18300	---	118
65	44/47/65	26.717	0.77	(37900)	---	142
66		31.379	0.76	17900	---	118
67		30.373	0.82	997	---	118
68		---	---	ND	---	118
69	49/69	26.164	0.77	(25300)	---	118
70	61/70/74/76	31.027	0.75	(40800)	---	118
71	40/41/71	27.841	0.77	(27300)	---	118
72		29.149	0.77	168	---	118
73		---	---	ND	---	118
74	61/70/74/76	31.027	0.75	(40800)	---	118
75	59/62/75	27.086	0.77	(4170)	---	118
76	61/70/74/76	31.027	0.75	(40800)	---	118
77		36.091	0.77	2040	---	118
78		35.169	0.72	142	---	118
79		34.464	0.72	613	---	118
80		---	---	ND	---	118
81		---	---	ND	---	118
82		35.655	1.50	4910	---	118
83		33.727	1.55	2570	---	118
84		31.178	1.57	11200	---	118
85	85/116/117	35.152	1.60	5620	---	142
86	86/87/97/108/119/125	34.464	1.56	28800	---	236
87	86/87/97/108/119/125	34.464	1.56	(28800)	---	236
88	88/91	30.960	1.58	6040	---	118
89		31.714	1.46	566	---	118
90	90/101/113	33.257	1.57	39600	---	118
91	88/91	30.960	1.58	(6040)	---	118
92		32.637	1.53	6430	---	118
93	93/98/100/102	30.407	1.74	1920	---	177
94		29.518	1.61	317	---	118
95		30.004	1.61	33100	---	118
96		27.036	1.63	480	---	118

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client Sample ID PRF0541-02;FO 080755
Lab Sample ID 1075280002-R
Filename P80802A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	34.464	1.56	(28800)	---	236
98	93/98/100/102	30.407	1.74	(1920)	---	177
99		33.894	1.57	18100	---	118
100	93/98/100/102	30.407	1.74	(1920)	---	177
101	90/101/113	33.257	1.57	(39600)	---	118
102	93/98/100/102	30.407	1.74	(1920)	---	177
103		29.300	1.75	224	---	118
104		---	---	ND	---	118
105		39.780	1.51	13400	---	118
106		---	---	ND	---	118
107	107/124	37.868	1.47	1210	---	118
108	86/87/97/108/119/125	34.464	1.56	(28800)	---	236
109		38.120	1.44	1890	---	118
110	110/115	35.336	1.56	45800	---	118
111		---	---	ND	---	118
112		---	---	ND	---	118
113	90/101/113	33.257	1.57	(39600)	---	118
114		39.126	1.56	768	---	118
115	110/115	35.336	1.56	(45800)	---	118
116	85/116/117	35.152	1.60	(5620)	---	142
117	85/116/117	35.152	1.60	(5620)	---	142
118		38.589	1.50	30300	---	118
119	86/87/97/108/119/125	34.464	1.56	(28800)	---	236
120		---	---	ND	---	118
121		---	---	ND	---	118
122		38.908	1.61	364	---	118
123		38.237	1.49	530	---	118
124	107/124	37.868	1.47	(1210)	---	118
125	86/87/97/108/119/125	34.464	1.56	(28800)	---	236
126		43.083	1.75	435	---	118
127		---	---	ND	---	118
128	128/166	43.100	1.20	5810	---	236
129	129/138/163	41.826	1.24	35700	---	118
130		41.138	1.23	2120	---	118
131		38.137	1.29	512	---	118
132		38.606	1.24	13300	---	118
133		39.227	1.04	---	339	118
134	134/143	37.516	1.26	1810	---	118
135	135/151	36.342	1.32	12200	---	120
136		33.710	1.27	5440	---	118
137		41.390	1.28	2530	---	118
138	129/138/163	41.826	1.24	(35700)	---	118
139	139/140	37.952	1.07	669	---	118
140	139/140	37.952	1.07	(669)	---	118
141		40.736	1.24	5340	---	118
142		---	---	ND	---	118
143	134/143	37.516	1.26	(1810)	---	118
144		36.929	1.23	1710	---	118

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client Sample ID PRF0541-02;FO 080755
Lab Sample ID 1075280002-R
Filename P80802A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	118
146		39.897	1.18	4090	---	118
147	147/149	37.315	1.22	30400	---	118
148		---	---	ND	---	118
149	147/149	37.315	1.22	(30400)	---	118
150		---	---	ND	---	118
151	135/151	36.342	1.32	(12200)	---	120
152		---	---	ND	---	118
153	153/168	40.551	1.21	27000	---	142
154		36.627	1.34	290	---	118
155		---	---	ND	---	118
156	156/157	46.135	1.19	5140	---	118
157	156/157	46.135	1.19	(5140)	---	118
158		42.228	1.25	3420	---	118
159		44.090	1.20	347	---	118
160		---	---	ND	---	118
161		---	---	ND	---	118
162		44.526	1.22	246	---	118
163	129/138/163	41.826	1.24	(35700)	---	118
164		41.507	1.22	1700	---	118
165		---	---	ND	---	118
166	128/166	43.100	1.20	(5810)	---	236
167		44.995	1.35	1330	---	118
168	153/168	40.551	1.21	(27000)	---	142
169		---	---	ND	---	118
170		48.835	0.99	7290	---	118
171	171/173	45.180	1.02	2400	---	118
172		46.907	1.06	1190	---	118
173	171/173	45.180	1.02	(2400)	---	118
174		44.073	1.03	8680	---	118
175		42.949	1.05	478	---	118
176		40.333	1.05	1300	---	118
177		44.542	1.03	4090	---	118
178		42.295	1.05	2070	---	118
179		39.394	1.07	4520	---	118
180	180/193	47.577	1.01	18800	---	118
181		---	---	ND	---	118
182		---	---	ND	---	118
183	183/185	43.872	1.00	6430	---	118
184		---	---	ND	---	118
185	183/185	43.872	1.00	(6430)	---	118
186		---	---	ND	---	118
187		43.234	1.06	13900	---	118
188		---	---	ND	---	118
189		52.092	1.19	379	---	118
190		49.405	1.03	1480	---	118
191		47.946	0.98	318	---	118
192		---	---	ND	---	118

Conc = Concentration
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Nn = Value obtained from additional analyses

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**Method 1668A Polychlorobiphenyl
Sample Analysis Results**

Client Sample ID PRF0541-02;FO 080755
Lab Sample ID 1075280002-R
Filename P80802A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.577	1.01	(18800)	---	118
194		54.204	0.94	4960	---	118
195		51.769	0.87	1980	---	118
196		50.227	0.88	3970	---	165
197	197/200	46.622	0.85	1510	---	590
198	198/199	49.556	0.90	10000	---	118
199	198/199	49.556	0.90	(10000)	---	118
200	197/200	46.622	0.85	(1510)	---	590
201		45.615	0.86	1290	---	118
202		44.660	0.90	1730	---	118
203		50.445	0.88	5910	---	118
204		---	---	ND	---	118
205		54.678	0.97	293	---	118
206		56.403	0.76	5550	---	118
207		52.458	0.88	726	---	118
208		51.510	0.78	1850	---	118
209		57.997	0.73	4090	---	118

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client Sample ID PRF0541-02;FO 080755
Lab Sample ID 1075280002-R
Filename P80802A_13

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	3350
Total Dichloro Biphenyls	102000
Total Trichloro Biphenyls	330000
Total Tetrachloro Biphenyls	282000
Total Pentachloro Biphenyls	255000
Total Hexachloro Biphenyls	161000
Total Heptachloro Biphenyls	73300
Total Octachloro Biphenyls	31600
Total Nonachloro Biphenyls	8130
Decachloro Biphenyls	4090
Total PCBs	1250000

ND = Not Detected

Results reported on a dry weight basis

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Method 1668A Polychlorobiphenyl Blank Analysis Results

Lab Sample ID	BLANK-17076		
Filename	P80802A_11		
Injected By	BAL	Matrix	Solid
Total Amount Extracted	10.1 g	Extracted	07/28/2008
ICAL ID	P80802A08	Analyzed	08/03/2008 02:21
CCal Filename(s)	P80802A_07	Dilution	NA

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
------------	-------	----	-------	------------	------------	------------

Labeled Analytes

13C-2-MoCB	1	8.008	2.91	2.0	1.45	72
13C-4-MoCB	3	11.291	2.84	2.0	1.55	77
13C-2,2'-DiCB	4	11.627	1.61	2.0	1.52	76
13C-4,4'-DiCB	15	19.655	1.48	2.0	1.71	86
13C-2,2',6-TrCB	19	15.976	1.06	2.0	1.61	81
13C-3,4,4'-TrCB	37	28.027	0.99	2.0	1.40	70
13C-2,2',6,6'-TeCB	54	19.961	0.79	2.0	1.77	89
13C-3,4,4',5-TeCB	81	35.472	0.75	2.0	0.982	49
13C-3,3',4,4'-TeCB	77	36.059	0.76	2.0	1.09	55
13C-2,2',4,6,6'-PeCB	104	26.585	1.58	2.0	2.19	110
13C-2,3,3',4,4'-PeCB	105	39.731	1.51	2.0	1.60	80
13C-2,3,4,4',5-PeCB	114	39.061	1.55	2.0	1.45	72
13C-2,3',4,4',5-PeCB	118	38.524	1.57	2.0	1.58	79
13C-2,3',4,4',5'-PeCB	123	38.189	1.56	2.0	1.51	75
13C-3,3',4,4',5-PeCB	126	42.951	1.52	2.0	1.74	87
13C-2,2',4,4',6,6'-HxCB	155	32.974	1.27	2.0	1.97	98
13C-HxCB (156/157)	156/157	46.003	1.20	4.0	3.96	99
13C-2,3',4,4',5,5'-HxCB	167	44.846	1.21	2.0	2.02	101
13C-3,3',4,4',5,5'-HxCB	169	49.306	1.22	2.0	2.16	108
13C-2,2',3,4',5,6,6'-HpCB	188	39.027	1.07	2.0	1.50	75
13C-2,3,3',4,4',5,5'-HpCB	189	51.835	1.01	2.0	1.70	85
13C-2,2',3,3',5,5',6-OcCB	202	44.544	0.92	2.0	1.61	81
13C-2,3,3',4,4',5,5',6-OcCB	205	54.400	0.87	2.0	1.79	90
13C-2,2',3,3',4,4',5,5',6-NoCB	206	56.124	0.80	2.0	1.97	98
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.296	0.80	2.0	1.99	99
13C--DeCB	209	57.698	0.72	2.0	1.95	97

Cleanup Standards

13C-2,4,4'-TrCB	28	23.382	1.00	2.0	1.85	92
13C-2,3,3',5,5'-PeCB	111	36.143	1.62	2.0	1.83	91
13C-2,2',3,3',5,5',6-HpCB	178	42.213	1.07	2.0	2.47	124

Recovery Standards

13C-2,5-DiCB	9	14.526	1.51	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	25.545	0.81	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.225	1.63	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.727	1.24	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.904	0.94	2.0	NA	NA

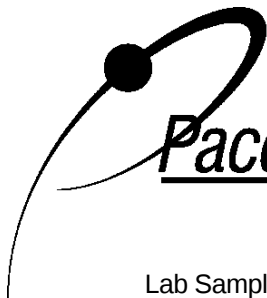
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**Method 1668A Polychlorobiphenyl
Blank Analysis Results**

Lab Sample ID BLANK-17076
Filename P80802A_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	49.7
2		---	---	ND	---	49.7
3		---	---	ND	---	49.7
4		---	---	ND	---	49.7
5		---	---	ND	---	49.7
6		---	---	ND	---	49.7
7		---	---	ND	---	49.7
8		---	---	ND	---	49.7
9		---	---	ND	---	49.7
10		---	---	ND	---	49.7
11		18.900	1.44	165	---	59.6
12	12/13	---	---	ND	---	49.7
13	12/13	---	---	ND	---	49.7
14		---	---	ND	---	49.7
15		---	---	ND	---	49.7
16		---	---	ND	---	49.7
17		---	---	ND	---	49.7
18	18/30	18.492	1.08	50.2	---	49.7
19		---	---	ND	---	49.7
20	20/28	23.399	0.99	98.3	---	59.6
21	21/33	23.667	0.97	51.4	---	49.7
22		---	---	ND	---	49.7
23		---	---	ND	---	49.7
24		---	---	ND	---	49.7
25		---	---	ND	---	49.7
26	26/29	---	---	ND	---	49.7
27		---	---	ND	---	49.7
28	20/28	23.399	0.99	(98.3)	---	59.6
29	26/29	---	---	ND	---	49.7
30	18/30	18.492	1.08	(50.2)	---	49.7
31		23.047	0.97	71.2	---	49.7
32		---	---	ND	---	49.7
33	21/33	23.667	0.97	(51.4)	---	49.7
34		---	---	ND	---	49.7
35		---	---	ND	---	49.7
36		---	---	ND	---	49.7
37		---	---	ND	---	49.7
38		---	---	ND	---	49.7
39		---	---	ND	---	49.7
40	40/41/71	---	---	ND	---	49.7
41	40/41/71	---	---	ND	---	49.7
42		---	---	ND	---	49.7
43		---	---	ND	---	49.7
44	44/47/65	---	---	ND	---	59.6
45	45/51	---	---	ND	---	49.7

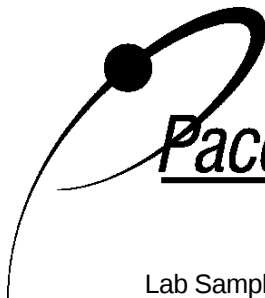
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Method 1668A Polychlorobiphenyl Blank Analysis Results

Lab Sample ID BLANK-17076
Filename P80802A_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
46		---	---	ND	---	49.7
47	44/47/65	---	---	ND	---	59.6
48		---	---	ND	---	49.7
49	49/69	---	---	ND	---	49.7
50	50/53	---	---	ND	---	49.7
51	45/51	---	---	ND	---	49.7
52		25.562	0.76	61.4	---	49.7
53	50/53	---	---	ND	---	49.7
54		---	---	ND	---	49.7
55		---	---	ND	---	49.7
56		---	---	ND	---	49.7
57		---	---	ND	---	49.7
58		---	---	ND	---	49.7
59	59/62/75	---	---	ND	---	49.7
60		---	---	ND	---	49.7
61	61/70/74/76	---	---	ND	---	49.7
62	59/62/75	---	---	ND	---	49.7
63		---	---	ND	---	49.7
64		---	---	ND	---	49.7
65	44/47/65	---	---	ND	---	59.6
66		---	---	ND	---	49.7
67		---	---	ND	---	49.7
68		---	---	ND	---	49.7
69	49/69	---	---	ND	---	49.7
70	61/70/74/76	---	---	ND	---	49.7
71	40/41/71	---	---	ND	---	49.7
72		---	---	ND	---	49.7
73		---	---	ND	---	49.7
74	61/70/74/76	---	---	ND	---	49.7
75	59/62/75	---	---	ND	---	49.7
76	61/70/74/76	---	---	ND	---	49.7
77		---	---	ND	---	49.7
78		---	---	ND	---	49.7
79		---	---	ND	---	49.7
80		---	---	ND	---	49.7
81		---	---	ND	---	49.7
82		---	---	ND	---	49.7
83		---	---	ND	---	49.7
84		---	---	ND	---	49.7
85	85/116/117	---	---	ND	---	59.6
86	86/87/97/108/119/125	---	---	ND	---	99.4
87	86/87/97/108/119/125	---	---	ND	---	99.4
88	88/91	---	---	ND	---	49.7
89		---	---	ND	---	49.7
90	90/101/113	---	---	ND	---	49.7

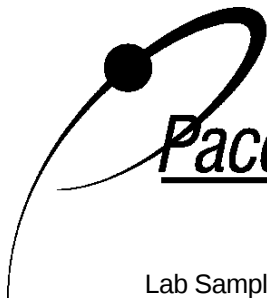
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**Method 1668A Polychlorobiphenyl
Blank Analysis Results**

Lab Sample ID BLANK-17076
Filename P80802A_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
91	88/91	---	---	ND	---	49.7
92		---	---	ND	---	49.7
93	93/98/100/102	---	---	ND	---	74.6
94		---	---	ND	---	49.7
95		---	---	ND	---	49.7
96		---	---	ND	---	49.7
97	86/87/97/108/119/125	---	---	ND	---	99.4
98	93/98/100/102	---	---	ND	---	74.6
99		---	---	ND	---	49.7
100	93/98/100/102	---	---	ND	---	74.6
101	90/101/113	---	---	ND	---	49.7
102	93/98/100/102	---	---	ND	---	74.6
103		---	---	ND	---	49.7
104		---	---	ND	---	49.7
105		---	---	ND	---	49.7
106		---	---	ND	---	49.7
107	107/124	---	---	ND	---	49.7
108	86/87/97/108/119/125	---	---	ND	---	99.4
109		---	---	ND	---	49.7
110	110/115	---	---	ND	---	49.7
111		---	---	ND	---	49.7
112		---	---	ND	---	49.7
113	90/101/113	---	---	ND	---	49.7
114		---	---	ND	---	49.7
115	110/115	---	---	ND	---	49.7
116	85/116/117	---	---	ND	---	59.6
117	85/116/117	---	---	ND	---	59.6
118		---	---	ND	---	49.7
119	86/87/97/108/119/125	---	---	ND	---	99.4
120		---	---	ND	---	49.7
121		---	---	ND	---	49.7
122		---	---	ND	---	49.7
123		---	---	ND	---	49.7
124	107/124	---	---	ND	---	49.7
125	86/87/97/108/119/125	---	---	ND	---	99.4
126		---	---	ND	---	49.7
127		---	---	ND	---	49.7
128	128/166	---	---	ND	---	99.4
129	129/138/163	---	---	ND	---	49.7
130		---	---	ND	---	49.7
131		---	---	ND	---	49.7
132		---	---	ND	---	49.7
133		---	---	ND	---	49.7
134	134/143	---	---	ND	---	49.7
135	135/151	---	---	ND	---	50.7

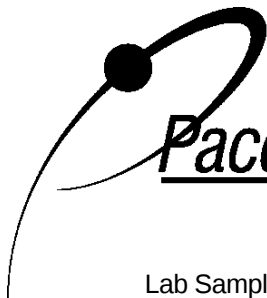
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**Method 1668A Polychlorobiphenyl
Blank Analysis Results**

Lab Sample ID
Filename

BLANK-17076
P80802A_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
136		---	---	ND	---	49.7
137		---	---	ND	---	49.7
138	129/138/163	---	---	ND	---	49.7
139	139/140	---	---	ND	---	49.7
140	139/140	---	---	ND	---	49.7
141		---	---	ND	---	49.7
142		---	---	ND	---	49.7
143	134/143	---	---	ND	---	49.7
144		---	---	ND	---	49.7
145		---	---	ND	---	49.7
146		---	---	ND	---	49.7
147	147/149	---	---	ND	---	49.7
148		---	---	ND	---	49.7
149	147/149	---	---	ND	---	49.7
150		---	---	ND	---	49.7
151	135/151	---	---	ND	---	50.7
152		---	---	ND	---	49.7
153	153/168	---	---	ND	---	59.6
154		---	---	ND	---	49.7
155		---	---	ND	---	49.7
156	156/157	---	---	ND	---	49.7
157	156/157	---	---	ND	---	49.7
158		---	---	ND	---	49.7
159		---	---	ND	---	49.7
160		---	---	ND	---	49.7
161		---	---	ND	---	49.7
162		---	---	ND	---	49.7
163	129/138/163	---	---	ND	---	49.7
164		---	---	ND	---	49.7
165		---	---	ND	---	49.7
166	128/166	---	---	ND	---	99.4
167		---	---	ND	---	49.7
168	153/168	---	---	ND	---	59.6
169		---	---	ND	---	49.7
170		---	---	ND	---	49.7
171	171/173	---	---	ND	---	49.7
172		---	---	ND	---	49.7
173	171/173	---	---	ND	---	49.7
174		---	---	ND	---	49.7
175		---	---	ND	---	49.7
176		---	---	ND	---	49.7
177		---	---	ND	---	49.7
178		---	---	ND	---	49.7
179		---	---	ND	---	49.7
180	180/193	---	---	ND	---	49.7

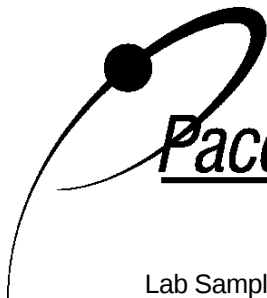
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EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
P = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
*! = See Discussion
! = Outside QC Limits
RT = Retention Time
I = Interference

Results reported on a dry weight basis

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



**Method 1668A Polychlorobiphenyl
Blank Analysis Results**

Lab Sample ID BLANK-17076
Filename P80802A_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
181		---	---	ND	---	49.7
182		---	---	ND	---	49.7
183	183/185	---	---	ND	---	49.7
184		---	---	ND	---	49.7
185	183/185	---	---	ND	---	49.7
186		---	---	ND	---	49.7
187		---	---	ND	---	49.7
188		---	---	ND	---	49.7
189		---	---	ND	---	49.7
190		---	---	ND	---	49.7
191		---	---	ND	---	49.7
192		---	---	ND	---	49.7
193	180/193	---	---	ND	---	49.7
194		---	---	ND	---	49.7
195		---	---	ND	---	49.7
196		---	---	ND	---	69.6
197	197/200	---	---	ND	---	249
198	198/199	---	---	ND	---	49.7
199	198/199	---	---	ND	---	49.7
200	197/200	---	---	ND	---	249
201		---	---	ND	---	49.7
202		---	---	ND	---	49.7
203		---	---	ND	---	49.7
204		---	---	ND	---	49.7
205		---	---	ND	---	49.7
206		---	---	ND	---	49.7
207		---	---	ND	---	49.7
208		---	---	ND	---	49.7
209		---	---	ND	---	49.7

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
P = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

Results reported on a dry weight basis

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
*! = See Discussion
! = Outside QC Limits
RT = Retention Time
I = Interference

REPORT OF LABORATORY ANALYSIS

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Pace AnalyticalTM

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

**Method 1668A Polychlorobiphenyl
Blank Analysis Results**

Client Sample ID
Lab Sample ID BLANK-17076
Filename P80802A_11

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	165
Total Trichloro Biphenyls	271
Total Tetrachloro Biphenyls	61.4
Total Pentachloro Biphenyls	ND
Total Hexachloro Biphenyls	ND
Total Heptachloro Biphenyls	ND
Total Octachloro Biphenyls	ND
Total Nonachloro Biphenyls	ND
Decachloro Biphenyls	ND
Total PCBs	498

ND = Not Detected

Results reported on a dry weight basis

REPORT OF LABORATORY ANALYSIS

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Method 1668A Polychlorobiphenyls Laboratory Control Spike Analysis Results

Lab Sample ID	LCS-17077		
Filename	P80780A_03	Matrix	Solid
Total Amount Extracted	10.1 g	Dilution	NA
ICAL ID	P80780A02	Extracted	07/28/2008
CCal Filename(s)	P80780A_01	Analyzed	08/01/2008 06:23
Method Blank ID	BLANK-17076	Injected By	BAL

PCB Isomer	Native Analytes			Labeled Analytes		
	Spiked (ng)	Found (ng)	% Recovery	Spiked (ng)	Found (ng)	% Recovery
1	1.0	1.02	102	2.0	1.36	68
3	1.0	1.07	107	2.0	1.45	72
4	1.0	1.09	109	2.0	1.48	74
15	1.0	1.09	109	2.0	1.78	89
19	1.0	1.05	105	2.0	1.65	83
37	1.0	1.08	108	2.0	1.62	81
54	1.0	0.993	99	2.0	1.60	80
81	1.0	0.927	93	2.0	1.12	56
77	1.0	0.920	92	2.0	1.31	65
104	1.0	1.02	102	2.0	2.07	103
105	1.0	1.02	102	2.0	1.69	85
114	1.0	0.966	97	2.0	1.56	78
118	1.0	1.10	110	2.0	1.69	84
123	1.0	0.968	97	2.0	1.62	81
126	1.0	0.895	90	2.0	1.85	92
155	1.0	0.992	99	2.0	1.62	81
156/157	2.0	1.92	96	4.0	3.65	91
167	1.0	1.02	102	2.0	1.80	90
169	1.0	0.980	98	2.0	1.90	95
188	1.0	1.02	102	2.0	1.46	73
189	1.0	0.967	97	2.0	1.71	86
202	1.0	1.06	106	2.0	1.50	75
205	1.0	1.02	102	2.0	1.71	85
206	1.0	0.992	99	2.0	1.64	82
208	1.0	1.02	102	2.0	1.72	86
209	1.0	1.01	101	2.0	1.57	78

P = Recovery outside of method
1668A control limits
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
! = See Discussion
ng = Nanograms

REPORT OF LABORATORY ANALYSIS

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Method 1668A Polychlorobiphenyls Laboratory Control Spike Analysis Results

Lab Sample ID	LCSD-17078	Matrix	Solid
Filename	P80780A_04	Dilution	NA
Total Amount Extracted	10.3 g	Extracted	07/28/2008
ICAL ID	P80780A02	Analyzed	08/01/2008 07:25
CCal Filename(s)	P80780A_01	Injected By	BAL
Method Blank ID	BLANK-17076		

PCB Isomer	Native Analytes			Labeled Analytes		
	Spiked (ng)	Found (ng)	% Recovery	Spiked (ng)	Found (ng)	% Recovery
1	1.0	1.05	105	2.0	1.21	61
3	1.0	1.07	107	2.0	1.33	66
4	1.0	1.15	115	2.0	1.23	62
15	1.0	1.06	106	2.0	1.69	84
19	1.0	1.07	107	2.0	1.51	76
37	1.0	1.08	108	2.0	1.54	77
54	1.0	1.01	101	2.0	1.48	74
81	1.0	0.933	93	2.0	0.973	49
77	1.0	0.934	93	2.0	1.08	54
104	1.0	1.01	101	2.0	2.03	101
105	1.0	0.982	98	2.0	1.40	70
114	1.0	0.945	94	2.0	1.28	64
118	1.0	1.10	110	2.0	1.38	69
123	1.0	0.924	92	2.0	1.21	60
126	1.0	0.839	84	2.0	1.60	80
155	1.0	0.973	97	2.0	1.84	92
156/157	2.0	1.92	96	4.0	3.80	95
167	1.0	0.976	98	2.0	1.95	98
169	1.0	0.925	93	2.0	2.09	104
188	1.0	1.02	102	2.0	1.39	69
189	1.0	0.952	95	2.0	1.58	79
202	1.0	1.05	105	2.0	1.45	72
205	1.0	0.956	96	2.0	1.67	83
206	1.0	1.00	100	2.0	1.66	83
208	1.0	0.988	99	2.0	1.75	87
209	1.0	1.19	119	2.0	1.58	79

P = Recovery outside of method
1668A control limits
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
! = See Discussion
ng = Nanograms

REPORT OF LABORATORY ANALYSIS

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Method 1668A

Spike Recovery Relative Percent Difference (RPD) Results

Client Test America

Spike 1 ID LCS-17077
Spike 1 Filename P80780A_03

Spike 2 ID LCSD-17078
Spike 2 Filename P80780A_04

Compound	IUPAC	Spike 1 %REC	Spike 2 %REC	%RPD
2-MoCB	1	102	105	2.9
4-MoCB	3	107	107	0.0
2,2'-DiCB	4	109	115	5.4
4,4'-DiCB	15	109	106	2.8
2,2',6-TrCB	19	105	107	1.9
3,4,4'-TrCB	37	108	108	0.0
2,2',6,6'-TeCB	54	99	101	2.0
3,3',4,4'-TeCB	77	92	93	1.1
3,4,4',5-TeCB	81	93	93	0.0
2,2',4,6,6'-PeCB	104	102	101	1.0
2,3,3',4,4'-PeCB	105	102	98	4.0
2,3,4,4',5-PeCB	114	97	94	3.1
2,3',4,4',5-PeCB	118	110	110	0.0
2,3,4,4',5'-PeCB	123	97	92	5.3
3,3',4,4',5-PeCB	126	90	84	6.9
2,2',4,4',6,6'-HxCB	155	99	97	2.0
(156/157)	156/157	96	96	0.0
2,3',4,4',5,5'-HxCB	167	102	98	4.0
3,3',4,4',5,5'-HxCB	169	98	93	5.2
2,2',3,4',5,6,6'-HpCB	188	102	102	0.0
2,3,3',4,4',5,5'-HpCB	189	97	95	2.1
2,2',3,3',5,5',6,6'-OoCB	202	106	105	0.9
2,3,3',4,4',5,5',6-OoCB	205	102	96	6.1
2,2',3,3',4,4',5,5',6-NoCB	206	99	100	1.0
2,2',3,3',4,5,5',6,6'-NoCB	208	102	99	3.0
Decachlorobiphenyl	209	101	119	16.4

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

REPORT OF LABORATORY ANALYSIS

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August 19, 2008

Jennifer Shackelford
City of Portland Water Pollution Laboratory
6543 N. Burlington Ave.
Portland, OR 97203

RE: Portland Harbor

Enclosed are the results of analyses for samples received by the laboratory on 06/13/08 14:32.
The following list is a summary of the Work Orders contained in this report, generated on 08/19/08 17:02.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
PRF0541	Portland Harbor	36238

TestAmerica Portland



Howard Holmes, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.

City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

36238

Project Manager:

Jennifer Shackelford

Report Created:

08/19/08 17:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FO 080754	PRF0541-01	Other wet	06/09/08 14:03	06/13/08 14:32
FO 080755	PRF0541-02	Other wet	06/03/08 15:12	06/13/08 14:32

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
08/19/08 17:02

Total Organic Carbon
TestAmerica Connecticut

Analyte	Method	Result	MDL *	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0541-01 (FO 080754)				Other wet			Sampled: 06/09/08 14:03			
Total Organic Carbon - Duplicates	9060	246000	-----	100	mg/Kg	1x	17307	06/24/08 19:42	06/24/08 19:42	
PRF0541-02 (FO 080755)				Other wet			Sampled: 06/03/08 15:12			
Total Organic Carbon - Duplicates	9060	240000	-----	100	mg/Kg	1x	17307	06/24/08 19:58	06/24/08 19:58	

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: 36238
Project Manager: Jennifer Shackelford

Report Created:
08/19/08 17:02

Total Organic Carbon - Laboratory Quality Control Results

TestAmerica Connecticut

QC Batch: 17307

Soil Preparation Method: NA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (220-17307-5)			QC Source:					Extracted: 06/24/08 19:26						
Total Organic Carbon - Duplicates	9060	4019	---	100	mg/Kg	1x	--	3530	114%	(28-172)	--	--	06/24/08 19:26	
Blank (220-17307-6)			QC Source:					Extracted: 06/24/08 19:32						
Total Organic Carbon - Duplicates	9060	ND	---	100	mg/Kg	1x	--	--	--	--	--	--	06/24/08 19:32	

TestAmerica Portland



Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

36238

Project Manager:

Jennifer Shackelford

Report Created:

08/19/08 17:02

Notes and Definitions

Report Specific Notes:

None

Laboratory Reporting Conventions:

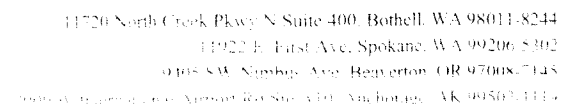
- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica Portland



Howard Holmes, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report shall not be reproduced except in full, without the written approval of the laboratory.



425-420-9200	FAX 420-9210	☐
509-924-9200	FAX 924-9290	☐
503-906-9200	FAX 906-9210	☒
907-563-9200	FAX 563-9210	☐

Work Order #: PRF054

[illegible]

⊗⊗ Total solids (w/w) determined @ WPCF due to limited sample size — use this value in calculations.

TestAmerica Sample Receipt Checklist

Received by:

(section A)

Date: 12/13/08

Time: 1432

Initials: BLE

Unpacked by:

(section B)

Date: 12/13/08

Initials: BLE

Logged-in by:

Date: 12/13/08

Initials: JL

Work Order No. PRF0541

Client: City of Portland

Project: Portland Harbor

Temperature out of range:

***ESI Clients (see Section C)

Cooler Temperature (IR): 10.0 °C plastic glass NA (oil/air OR ESI client)

Temperature Blank: _____ °C DIGI #1 #2

Not enough Ice
No Ice
Ice Melted
Win 4 Hours
Other

A

Custody Seals: (# _____)

Signature: Y N Dated: _____

☒ None

Container Type:

1 #Cooler(s)

____ #Box(s)

____ None (____ #Other: _____)

Coolant Type:

____ Gel/ Blue Ice

☒ Loose Ice

____ None

Packing Material:

____ Bubble Bags

____ Styrofoam Cubbies

____ Peanuts

☒ None (____ Other: _____)

Received from:

☒ TA Courier

____ Senvoy

____ UPS

____ Fed Ex

____ Client

____ TDP

____ USPS

____ SDS

____ Mid-Valley

____ GS/TA

____ GS/Senvoy

____ Other: _____

B

Sample Status:

(If N circled, see NOD)

General:

Intact?

Y
Y
Y

N
N
N

Containers Match COC?

none given

IDs Match COC?

For Analyses Requested:

Cyanide checked?

Y

N

NA

Correct Type & Preservation?

Y

N

Adequate Volume?

Y

N

Within Hold Time?

Y

N

Volatiles/ Oil Quality:

VOAs/ Syringes free of Headspace?

Y

N

NA

TB on COC? not provided

Y

N

NA

Metals:

HNO3 Preserved?

Y

N

NA

Dissolved Metals Filtered?

Y

N

NA

FED EX/ UPS:

Was the tracking paper keepable? YES NO

If circled NO, what is the Tracking number? _____

FED EX

Goldstreak

UPS

DHL

Other: _____

Temperature Blank: _____ °C

not provided

DIGI #1 #2

All preserved bottles checked

Y N

NA (voas/soils/all unp.)

All preserved accordingly?

Y N

(see NOD)

NA (voas/soils/all unp.)

Comments: _____

Project Managers: _____

PM Reviewed: _____

(Initial/Date)