— CITY OF PORTLAND —
ENVIRONMENTAL SERVICES
1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204 ▪ Dan Saltzman, Commissioner ▪ Dean Marriott, Director

TECHNICAL MEMORANDUM No. OF19-2

City Outfall Basin 19
Inline Solids Sampling at the Former Calbag Metals Site

TO: Karen Tarnow, Oregon Department of Environmental Quality (DEQ)

FROM: Linda Scheffler, City of Portland, Bureau of Environmental Services (BES) LS

COPIES: Tom Gainer, DEQ
Kristine Koch, U.S. Environmental Protection Agency (EPA)
Julia Fowler, GSI Water Solutions, Inc.

DATE: April 16, 2009

SUBJECT: **Portland Harbor Source Control Investigation**

Introduction

This technical memorandum summarizes the results of the City of Portland BES source investigation of inline solids at the former site of Calbag Metals, located within the Outfall Basin 19 stormwater conveyance system. This investigation was conducted as a follow-up to the City's 2007 inline solids sampling at this location. Its objective was to determine whether the Calbag site is an ongoing source of polychlorinated biphenyls (PCBs) to Basin 19. Between November 2007 and May 2008, the City deployed sediment traps in the Calbag lateral stormwater line to collect inline solids. Consistent with the findings from the 2007 inline solids sampling, investigation results for the 2008 sample indicate PCBs are being discharged from the Calbag site to the Basin 19 conveyance system at concentrations that may impact Willamette River sediment and water quality. These results indicate that the source control measures implemented to date at the Calbag site have not controlled the source of PCBs to the City's stormwater conveyance system. Inline solids data collected by the Lower Willamette Group (LWG) in 2007 confirm the presence of PCBs in the Basin 19 system, below the connection from the Calbag site (LWG, 2008).

These comments are provided in accordance with the joint objectives of the Intergovernmental Agreement between DEQ and the City for identifying and evaluating discharges to the City's shared stormwater collection system and making recommendations regarding appropriate source control measures.

Background

Calbag Metals formerly operated a metals recycling facility at 4927 NW Front Avenue (see Figure 1). Calbag vacated the property in 2003, and current operations do not require an NPDES stormwater permit. The Budget Truck Rental and O'Neill Transfer & Storage operations occupy

the larger building on the western portion of the site; O'Neill Transfer & Storage obtained a No Exposure Certification from DEQ in 2008 for industrial stormwater. Fast Fabricators operates in the eastern portion of the site. Neither operation handles PCBs.

DEQ identified the Calbag site as a potential historic source of PCBs, metals and phthalates to the Willamette River and subsequently worked with the site under the Voluntary Cleanup Program to evaluate and control pollutant sources and pathways (DEQ, 2006). In 2005, accumulated sediments within the storm drain lines at the site and in adjacent portions of the Basin 19 conveyance system were removed and the site was repaved with the goal of reducing or eliminating the source of contaminants to Outfall 19. In the final source control decision and no further action (NFA) determination, DEQ directed Calbag to collect confirmatory stormwater samples through the spring of 2006 and to analyze the stormwater samples for total suspended solids and total and dissolved copper, lead, and zinc (DEQ, 2005). Calbag was not required to analyze the stormwater samples for additional contaminants of interest identified by DEQ at the site, including PCBs, phthalates, and other metals.

During the spring of 2007, the City collected a stormwater solids sample from the Calbag site to evaluate whether contaminants were still being discharged to Basin 19 after the implementation of site source control measures (BES, 2008). Results of the 2007 investigation indicated the Calbag site continues to be a source of PCBs to the City's stormwater conveyance system. Due to limited sample volume, samples were analyzed only for PCBs, and the PCB Aroclor analysis was run rather than the intended congener analysis. To evaluate whether additional contaminants are being discharged from the Calbag site to the Basin 19 stormwater conveyance system and to facilitate a comparison of congener patterns between inline solids discharged from Calbag and the inline solids previously collected by the LWG in Basin 19, the City redeployed sediment traps at the Calbag site sampling manhole in winter 2007/2008.

Sampling Activities

City Sampling Activities. The City initially deployed two inline sediment traps in the Calbag sampling manhole in March 2007. The sediment traps were inspected monthly and removed on June 18, 2007. Activities associated with this initial deployment are described in detail in Technical Memorandum No. OF19-1 (BES, 2008).

In preparation for the winter 2007/2008 inline solids sampling, the City submitted a sampling and analysis plan (SAP) to DEQ for collecting stormwater solids samples from three outfall basins, including Basin 19 (BES, 2007). The sampling activities described in the following paragraphs were conducted in accordance with that SAP.

Two inline sediment traps were installed on November 26, 2007, in a lateral line that conveys stormwater from the Calbag site to the shared City stormwater line in NW Kittridge Avenue (see Figure 1). As with the 2007 deployment, the inline sediment traps were deployed in a 21-inch-diameter line, approximately 0.5 and 1.25 feet, respectively, downstream of the site's sampling manhole.

The sediment traps were inspected periodically and removed on May 28, 2008. Approximately 0.3 and 0.6 inches of solids had accumulated in the two sediment trap bottles at the time of removal. Sample bottle contents were filtered and combined at the City's Water Pollution Control Laboratory to generate a composite solids sample for laboratory analysis. Because the sample volume was not sufficient to conduct all desired analyses, the sample was analyzed only for PCB congeners, total solids, and total organic carbon (TOC). Photographs of the sediment

trap installations and sample processing activities are included in Attachment A. Field notes recorded during sediment trap installation, monitoring and removal activities are provided in Attachment B.

LWG Sampling Activities. During the spring of 2007, the LWG collected a sediment trap solids sample from Basin 19, at manhole AAP918, located downstream of the Calbag site (see Figure 1). Samples collected from this location represent all known piped contributions to the basin. The sample was analyzed for metals, PCB congeners, polycyclic aromatic hydrocarbons (PAHs), phthalates, semivolatile organic compounds, pesticides, herbicides, total solids and TOC. The PCB congener, total solids and TOC data are incorporated into this technical memorandum for data comparison purposes.

Summary of Results and Evaluation

Table 1 summarizes the total solids and TOC results for the Calbag and the LWG Basin 19 sediment trap solids samples. Table 1 also summarizes PCB Aroclor results for the 2007 sediment trap sample collected at Calbag, with the corresponding Portland Harbor Joint Source Control Strategy (JSCS) (DEQ/EPA, 2005) screening level values (SLVs) for comparison. Table 2 summarizes the PCB congener results for the 2008 Calbag sample and the LWG sample. The laboratory data report and a quality assurance/quality control (QA/QC) review summary for the 2008 Calbag sample are provided in Attachment C.

The concentration of total PCB congeners detected in the 2008 Calbag sample (2,360 ug/Kg) exceeds the JSCS Toxicity and Bioaccumulation SLVs, and several individual congeners exceed the corresponding Bioaccumulation SLVs. These results indicate that the source control measures implemented to date at the Calbag site have not controlled the source of PCBs to the shared City stormwater conveyance system.

The concentration of total PCB congeners in the Basin 19 sample (214 ug/Kg) was an order of magnitude lower than the concentration in the 2008 Calbag sample, but within the same order of magnitude as the total PCB Aroclor concentration in the 2007 Calbag sample (630 ug/Kg), which was collected during the approximate same timeframe as the Basin 19 sample.

A comparison of the individual PCB congener detections in the 2008 Calbag sample and the 2007 Basin 19 sample is problematic because of the differences in coelution patterns and in standard mixtures used for calibration between the different analytical laboratories contracted by the City and the LWG. Nonetheless, based on a comparison of total PCBs concentrations detected in samples collected from the Calbag stormwater lateral with the concentration detected at the Basin 19 monitoring location, Calbag appears to be a significant uncontrolled source within the basin.

Conclusions and Recommendations

Results of this source investigation confirm findings from the City's earlier investigation indicating that PCBs are being discharged from the Calbag site to the Basin 19 conveyance system at elevated concentrations. Although DEQ issued an NFA determination to the former Calbag Metals site, the ongoing discharge of contaminants via the stormwater pathway may have adverse impacts on Willamette River sediment and water quality. To be protective of the river, this site needs to identify current sources of PCBs and to select and to implement adequate control measures. The City requests that DEQ exercise its authority under the Cleanup and/or Water Quality Programs to require either Calbag or the current owner/operator to address

ongoing contaminant discharges from the site to the Willamette River via the shared stormwater conveyance system.

References

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.

BES. 2008. Technical Memorandum No. OF19-1, City Outfall Basin 19, Inline Solids Sampling at the Former Calbag Metals Site. City of Portland, Bureau of Environmental Services. February 4, 2008.

DEQ. 2005. Memorandum to Kristine Koch, US EPA. Source Control Decision – Final, No Further Action Determination, Calbag Metals, 4927 NW Front Ave., Portland, OR. November 3, 2005.

DEQ. 2006. DEQ Site Summary Full Report – Details for ECSI Site ID 2454, Calbag Metals. DEQ Environmental Cleanup Site Information Database (ECSI), accessed January 2008. http://www.deq.state.or.us/lq/ECSI/ecsidetailfull.asp?seqnbr=2454

DEQ/EPA. 2005. Portland Harbor Joint Source Control Strategy, Final, dated December 2005 (updated July 2007).

LWG. 2008. Portland Harbor RI/FS Round 3A and 3B Stormwater Data Report. Prepared for the Lower Willamette Group by Anchor Environmental, LLC and Integral Consulting Inc. September 2008.

Tables

Table 1 – *Summary of Chemical Analytical Results, Sediment Trap Samples, Outfall Basin 19*
Table 2 – *Summary of Polychlorinated Biphenyl Congener Analytical Results, Sediment Trap Samples, Outfall Basin 19*

Figure

Figure 1 – *Basin 19, Sediment Trap Sampling Locations*

Attachments

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

Table 1
Summary of Chemical Analytical Results
Sediment Trap Samples
Outfall Basin 19

Class	Analyte	Units	**Calbag Sample** 4927 NW Front FO070810 6/18/2007	**Calbag Sample** 4927 NW Front FO080753 6/2/2008	**LWG Basin 19 Sample** Manhole AAP918 LW3-STW-S10-OF19 7/3/2007	**JSCS [1] Screening Level Values (SLVs)** Toxicity	Bioaccumulation
Total Organic Carbon (City Sample by EPA 9060 MOD; LWG Sample by PSEP)							
	TOC	%	NA	15.9	5.57	--	--
Total Solids (City Sample by SM 2540 G; LWG Sample by E160.3M)							
	TS	%	51.3	46.2	47.1	--	--
Polychlorinated Biphenyls (PCBs) (EPA 8082)							
	Aroclor 1016	µg/kg	32 U	NA	NA	530	--
	Aroclor 1221	µg/kg	63 U	NA	NA	--	--
	Aroclor 1232	µg/kg	32 U	NA	NA	--	--
	Aroclor 1242	µg/kg	32 U	NA	NA	--	--
	Aroclor 1248	µg/kg	190	NA	NA	1500	--
	Aroclor 1254	µg/kg	32 U	NA	NA	300	--
	Aroclor 1260	µg/kg	440	NA	NA	200	--
	Aroclor 1262	µg/kg	32 U	NA	NA	--	--
	Aroclor 1268	µg/kg	120 Ui	NA	NA	--	--
	Total PCBs	µg/kg	**630**	NA	NA	676	0.39

Notes:

U = The analyte was not detected above the reported sample quantification limit.

Ui = The analyte was not detected, and the MRL/MDL has been elevated due to a chromatographic interference.

NA = Not analyzed

-- No JSCS screening level available.

µg/kg = Micrograms per kilogram.

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

= 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 Samples
Outfall Basin 19

IUPAC Number[1]	Chemical Name	Units	Calbag Sample 4927 NW Front FO080753 6/2/2008	LWG Basin 19 Sample Manhole AAP918 LW3-STW-S10-OF19 7/3/2007	JSCS[2] Screening Level Value (Toxicity)	JSCS[2] Screening Level Value (Bioaccumulation)
Chlorinated Biphenyl Congeners (EPA 1668A)						
PCB 001	2-MoCB	ug/Kg	0.406	0.285	--	--
PCB 002	3-MoCB	ug/Kg	0.199	0.0823	--	--
PCB 003	4-MoCB	ug/Kg	0.5	0.211	--	--
PCB 004	2,2'-DiCB	ug/Kg	7.98	NA	--	--
PCB 004/010	2,2'-DiCB + 2,6-DiCB	ug/Kg	NA	0.0592 U	--	--
PCB 005	2,3-DiCB	ug/Kg	0.146	NA	--	--
PCB 005/008	2,3-DiCB + 2,4'-DiCB	ug/Kg	NA	1.61	--	--
PCB 006	2,3'-DiCB	ug/Kg	4.15	0.0592 U	--	--
PCB 007	2,4-DiCB	ug/Kg	0.693	NA	--	--
PCB 007/009	2,4-DiCB + 2,5-DiCB	ug/Kg	NA	0.0592 U	--	--
PCB 008	2,4'-DiCB	ug/Kg	20.5	NA	--	--
PCB 009	2,5-DiCB	ug/Kg	1.21	NA	--	--
PCB 010	2,6-DiCB	ug/Kg	0.206	NA	--	--
PCB 011	3,3'-DiCB	ug/Kg	7.11	2.73	--	--
PCB 012/013	3,4-DiCB + 3,4'-DiCB	ug/Kg	1.86	0.0592 U	--	--
PCB 014	3,5-DiCB	ug/Kg	0.0494 U	0.0592 U	--	--
PCB 015	4,4'-DiCB	ug/Kg	15.5	1.45	--	--
PCB 016	2,2',3-TriCB	ug/Kg	20.8	NA	--	--
PCB 016/032	2,2',3-TriCB + 2,4',6-TriCB	ug/Kg	NA	2.23	--	--
PCB 017	2,2',4-TriCB	ug/Kg	33.3	1.29	--	--
PCB 018	2,2',5-TriCB	ug/Kg	NA	3.3	--	--
PCB 018/030	2,2',5-TriCB + 2,4,6-TriCB	ug/Kg	64.4	NA	--	--
PCB 019	2,2',6-TriCB	ug/Kg	4.88	0.341	--	--
PCB 020/028	2,3,3'-TriCB + 2,4,4'-TriCB	ug/Kg	100	NA	--	--
PCB 020/021/033	2,3,3'-TriCB + 2,3,4-TriCB + 2',3,4-TriCB	ug/Kg	NA	2.08	--	--
PCB 021/033	2,3,4-TriCB + 2',3,4-TriCB	ug/Kg	50.4	NA	--	--
PCB 022	2,3,4'-TriCB	ug/Kg	31.2	1.39	--	--
PCB 023	2,3,5-TriCB	ug/Kg	0.126	0.0296 U	--	--
PCB 024	2,3,6-TriCB	ug/Kg	0.681 EMPC	NA	--	--
PCB 024/027	2,3,6-TriCB + 2,3',6-TriCB	ug/Kg	NA	0.271	--	--
PCB 025	2,3',4-TriCB	ug/Kg	7.44	0.277	--	--
PCB 026	2,3',5-TriCB	ug/Kg	NA	0.586	--	--
PCB 026/029	2,3',5-TriCB + 2,4,5-TriCB	ug/Kg	18.9	NA	--	--
PCB 027	2,3',6-TriCB	ug/Kg	5.05	NA	--	--
PCB 028	2,4,4'-TriCB	ug/Kg	NA	2.9	--	--
PCB 029	2,4,5-TriCB	ug/Kg	NA	0.0296 U	--	--
PCB 030	2,4,6-TriCB	ug/Kg	NA	0.0296 U	--	--
PCB 031	2,4',5-TriCB	ug/Kg	85.4	3.11	--	--
PCB 032	2,4',6-TriCB	ug/Kg	23.6	NA	--	--
PCB 034	2',3,5-TriCB	ug/Kg	0.344	0.0296 U	--	--
PCB 035	3,3',4-TriCB	ug/Kg	1.36	0.11	--	--
PCB 036	3,3',5-TriCB	ug/Kg	0.0536	0.0296 U	--	--
PCB 037	3,4,4'-TriCB	ug/Kg	22.5	1.39	--	--
PCB 038	3,4,5-TriCB	ug/Kg	0.0543 EMPC	0.0296 U	--	--
PCB 039	3,4',5-TriCB	ug/Kg	0.331	0.0296 U	--	--
PCB 040	2,2',3,3'-TeCB	ug/Kg	NA	0.809	--	--
PCB 040/041/071	2,2',3,3'-TeCB + 2,2',3,4-TeCB + 2,3',4',6-TeCB	ug/Kg	49.7	NA	--	--
PCB 041/064/071/072	2,2',3,4-TeCB + 2,3,4',6-TeCB + 2,3',4',6-TeCB + 2,3',5,5'-TeCB	ug/Kg	NA	3.14	--	--
PCB 042	2,2',3,4'-TeCB	ug/Kg	24	NA	--	--
PCB 042/059	2,2',3,4'-TeCB + 2,3,3',6-TeCB	ug/Kg	NA	1.35	--	--
PCB 043	2,2',3,5-TeCB	ug/Kg	4.11	NA	--	--
PCB 043/049	2,2',3,5-TeCB + 2,2',4,5'-TeCB	ug/Kg	NA	2.82	--	--

IUPAC Number[1]	Chemical Name	Units	Calbag Sample 4927 NW Front FO080753 6/2/2008		LWG Basin 19 Sample Manhole AAP918 LW3-STW-S10-OF19 7/3/2007		JSCS[2] Screening Level Value (Toxicity)	JSCS[2] Screening Level Value (Bioaccumulation)
Chlorinated Biphenyl Congeners (EPA 1668A)								
PCB 044	2,2',3,5'-TeCB	ug/Kg	NA		4.94		--	--
PCB 044/047/065	2,2',3,5'-TeCB + 2,2',4,4'-TeCB + 2,3,5,6-TeCB	ug/Kg	80.1		NA		--	--
PCB 045	2,2',3,6-TeCB	ug/Kg	NA		0.727		--	--
PCB 045/051	2,2',3,6-TeCB + 2,2',4,6'-TeCB	ug/Kg	22		NA		--	--
PCB 046	2,2',3,6'-TeCB	ug/Kg	6.63		0.3		--	--
PCB 047	2,2',4,4'-TeCB	ug/Kg	NA		1.24		--	--
PCB 048	2,2',4,5-TeCB	ug/Kg	19.7		NA		--	--
PCB 048/075	2,2',4,5-TeCB + 2,4,4',6-TeCB	ug/Kg	NA		0.572		--	--
PCB 049/069	2,2',4,5'-TeCB + 2,3',4,6-TeCB	ug/Kg	52		NA		--	--
PCB 050	2,2',4,6-TeCB	ug/Kg	NA		0.0296	U	--	--
PCB 050/053	2,2',4,6-TeCB + 2,2',5,6'-TeCB	ug/Kg	18.1		NA		--	--
PCB 051	2,2',4,6'-TeCB	ug/Kg	NA		0.187		--	--
PCB 052	2,2',5,5'-TeCB	ug/Kg	118		NA		--	--
PCB 052/069	2,2',5,5'-TeCB + 2,3',4,6-TeCB	ug/Kg	NA		4.41		--	--
PCB 053	2,2',5,6'-TeCB	ug/Kg	NA		0.572		--	--
PCB 054	2,2',6,6'-TeCB	ug/Kg	0.13		0.0296	U	--	--
PCB 055	2,3,3',4-TeCB	ug/Kg	0.0494	U	0.0867		--	--
PCB 056	2,3,3',4'-TeCB	ug/Kg	22.3		NA		--	--
PCB 056/060	2,3,3',4'-TeCB + 2,3,4,4'-TeCB	ug/Kg	NA		2.24		--	--
PCB 057	2,3,3',5-TeCB	ug/Kg	0.0986		0.0232	J	--	--
PCB 058	2,3,3',5'-TeCB	ug/Kg	0.184		0.109		--	--
PCB 059/062/075	2,3,3',6-TeCB + 2,3,4,6-TeCB + 2,4,4',6-TeCB	ug/Kg	8.16		NA		--	--
PCB 060	2,3,4,4'-TeCB	ug/Kg	14.2		NA		--	--
PCB 061/070	2,3,4,5-TeCB + 2,3',4',5-TeCB	ug/Kg	NA		4.41		--	--
PCB 061/070/074/076	2,3,4,5-TeCB + 2,3',4',5-TeCB + 2,4,4',5-TeCB + 2',3,4,5-TeCB	ug/Kg	111		NA		--	--
PCB 062	2,3,4,6-TeCB	ug/Kg	NA		0.0296	U	--	--
PCB 063	2,3,4',5-TeCB	ug/Kg	2.35		0.121		--	--
PCB 064	2,3,4',6-TeCB	ug/Kg	35.4		NA		--	--
PCB 065	2,3,5,6-TeCB	ug/Kg	NA		0.0296	U	--	--
PCB 066	2,3',4,4'-TeCB	ug/Kg	56.2		NA		--	--
PCB 066/076	2,3',4,4'-TeCB + 2',3,4,5-TeCB	ug/Kg	NA		3.05		--	--
PCB 067	2,3',4,5-TeCB	ug/Kg	2.35		0.0296	U	--	--
PCB 068	2,3',4,5'-TeCB	ug/Kg	0.203		0.0523		--	--
PCB 072	2,3',5,5'-TeCB	ug/Kg	0.466		NA		--	--
PCB 073	2,3',5',6-TeCB	ug/Kg	0.0494	U	0.0296	U	--	--
PCB 074	2,4,4',5-TeCB	ug/Kg	NA		1.56		--	--
PCB 077	3,3',4,4'-TeCB	ug/Kg	**7.8**		**0.502**		--	0.052
PCB 078	3,3',4,5-TeCB	ug/Kg	0.0494	U	0.0296	U	--	--
PCB 079	3,3',4,5'-TeCB	ug/Kg	1.47		0.0788	UJ	--	--
PCB 080	3,3',5,5'-TeCB	ug/Kg	0	U	0.0296	U	--	--
PCB 081	3,4,4',5-TeCB	ug/Kg	0.257	EMPC	**0.0631**		--	0.017
PCB 082	2,2',3,3',4-PeCB	ug/Kg	9.27		1.3		--	--
PCB 083	2,2',3,3',5-PeCB	ug/Kg	3.92		0.0296	U	--	--
PCB 084	2,2',3,3',6-PeCB	ug/Kg	26.6		NA		--	--
PCB 084/092	2,2',3,3',6-PeCB + 2,2',3,5,5'-PeCB	ug/Kg	NA		3.31		--	--
PCB 085/116	2,2',3,4,4'-PeCB + 2,3,4,5,6-PeCB	ug/Kg	NA		1.03		--	--
PCB 085/116/117	2,2',3,4,4'-PeCB + 2,3,4,5,6-PeCB + 2,3,4',5,6-PeCB	ug/Kg	11.9		NA		--	--
PCB 086	2,2',3,4,5-PeCB	ug/Kg	NA		0.0296	U	--	--
PCB 086/087/097/108/119/125	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	60.2		NA		--	--
PCB 087/117/125	2,2',3,4,5'-PeCB + 2,3,4',5,6-PeCB + 2',3,4,5,6'-PeCB	ug/Kg	NA		3.62		--	--
PCB 088/091	2,2',3,4,6-PeCB + 2,2',3,4',6-PeCB	ug/Kg	15.5		0.962		--	--
PCB 089	2,2',3,4,6'-PeCB	ug/Kg	1.24		0.0745		--	--
PCB 090/101	2,2',3,4',5-PeCB + 2,2',4,5,5'-PeCB	ug/Kg	NA		8.96		--	--
PCB 090/101/113	2,2',3,4',5-PeCB + 2,2',4,5,5'-PeCB + 2,3,3',5',6-PeCB	ug/Kg	87.3		NA		--	--
PCB 092	2,2',3,5,5'-PeCB	ug/Kg	13.6		NA		--	--
PCB 093	2,2',3,5,6-PeCB	ug/Kg	NA		0.0296	U	--	--

IUPAC Number[1]	Chemical Name	Units	Calbag Sample 4927 NW Front FO080753 6/2/2008	LWG Basin 19 Sample Manhole AAP918 LW3-STW-S10-OF19 7/3/2007	JSCS[2] Screening Level Value (Toxicity)	JSCS[2] Screening Level Value (Bioaccumulation)
Chlorinated Biphenyl Congeners (EPA 1668A)						
PCB 093/098/100/102	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	4.59	NA	--	--
PCB 094	2,2',3,5,6'-PeCB	ug/Kg	0.683	0.0348	--	--
PCB 095	2,2',3,5',6-PeCB	ug/Kg	81.1	NA	--	--
PCB 095/098/102	2,2',3,5',6-PeCB + 2,2',3',4,6-PeCB + 2,2',4,5,6'-PeCB	ug/Kg	NA	5.82	--	--
PCB 096	2,2',3,6,6'-PeCB	ug/Kg	1.1	0.0588	--	--
PCB 097	2,2',3',4,5-PeCB	ug/Kg	NA	2.78	--	--
PCB 099	2,2',4,4',5-PeCB	ug/Kg	39.9	3.44	--	--
PCB 100	2,2',4,4',6-PeCB	ug/Kg	NA	0.0176 J	--	--
PCB 103	2,2',4,5',6-PeCB	ug/Kg	0.61	0.039	--	--
PCB 104	2,2',4,6,6'-PeCB	ug/Kg	0.0494 U	0.0296 U	--	--
PCB 105	2,3,3',4,4'-PeCB	ug/Kg	**44**	**3.49**	--	0.17
PCB 106	2,3,3',4,5-PeCB	ug/Kg	0.0494 U	NA	--	--
PCB 106/118	2,3,3',4,5-PeCB + 2,3',4,4',5-PeCB	ug/Kg	NA	9.24	--	--
PCB 107/109	2,3,3',4',5-PeCB + 2,3,3',4,6-PeCB	ug/Kg	NA	0.307	--	--
PCB 107/124	2,3,3',4',5-PeCB + 2',3,4,5,5'-PeCB	ug/Kg	3.32	NA	--	--
PCB 108/112	2,3,3',4,5'-PeCB + 2,3,3',5,6-PeCB	ug/Kg	NA	0.397	--	--
PCB 109	2,3,3',4,6-PeCB	ug/Kg	4.66	NA	--	--
PCB 110	2,3,3',4',6-PeCB	ug/Kg	NA	11.8	--	--
PCB 110/115	2,3,3',4',6-PeCB + 2,3,4,4',6-PeCB	ug/Kg	83.5	NA	--	--
PCB 111	2,3,3',5,5'-PeCB	ug/Kg	0.0494 U	NA	--	--
PCB 111/115	2,3,3',5,5'-PeCB + 2,3,4,4',6-PeCB	ug/Kg	NA	0.418	--	--
PCB 112	2,3,3',5,6-PeCB	ug/Kg	0.0494 U	NA	--	--
PCB 113	2,3,3',5',6-PeCB	ug/Kg	NA	0.0296 U	--	--
PCB 114	2,3,4,4',5-PeCB	ug/Kg	**2.71**	**0.205**	--	0.17
PCB 118	2,3',4,4',5-PeCB	ug/Kg	**92.6**	NA	--	0.12
PCB 119	2,3',4,4',6-PeCB	ug/Kg	NA	0.101	--	--
PCB 120	2,3',4,5,5'-PeCB	ug/Kg	0.0691	0.0296 U	--	--
PCB 121	2,3',4,5',6-PeCB	ug/Kg	0.0494 U	0.0296 U	--	--
PCB 122	2',3,3',4,5-PeCB	ug/Kg	1.04	0.117	--	--
PCB 123	2',3,4,4',5-PeCB	ug/Kg	**1.9**	**0.515**	--	0.21
PCB 124	2',3,4,5,5'-PeCB	ug/Kg	NA	0.166	--	--
PCB 126	3,3',4,4',5-PeCB	ug/Kg	**1.8**	**0.091**	--	0.00005
PCB 127	3,3',4,5,5'-PeCB	ug/Kg	0.225	0.0296 U	--	--
PCB 128/162	2,2',3,3',4,4'-HxCB + 2,3,3',4',5,5'-HxCB	ug/Kg	NA	2.08	--	--
PCB 128/166	2,2',3,3',4,4'-HxCB + 2,3,4,4',5,6-HxCB	ug/Kg	13.7	NA	--	--
PCB 129	2,2',3,3',4,5-HxCB	ug/Kg	NA	0.534	--	--
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	85.8	NA	--	--
PCB 130	2,2',3,3',4,5'-HxCB	ug/Kg	5.46	0.505	--	--
PCB 131	2,2',3,3',4,6-HxCB	ug/Kg	1.43	0.0296 U	--	--
PCB 132	2,2',3,3',4,6'-HxCB	ug/Kg	30.8	NA	--	--
PCB 132/161	2,2',3,3',4,6'-HxCB + 2,3,3',4,5',6-HxCB	ug/Kg	NA	3.53	--	--
PCB 133	2,2',3,3',5,5'-HxCB	ug/Kg	1.04	NA	--	--
PCB 133/142	2,2',3,3',5,5'-HxCB + 2,2',3,4,5,6-HxCB	ug/Kg	NA	0.337	--	--
PCB 134/143	2,2',3,3',5,6-HxCB + 2,2',3,4,5,6'-HxCB	ug/Kg	3.86	0.619	--	--
PCB 135	2,2',3,3',5,6'-HxCB	ug/Kg	NA	1.62	--	--
PCB 135/151	2,2',3,3',5,6'-HxCB + 2,2',3,5,5',6-HxCB	ug/Kg	24.8	NA	--	--
PCB 136	2,2',3,3',6,6'-HxCB	ug/Kg	11.2	1.33	--	--
PCB 137	2,2',3,4,4',5-HxCB	ug/Kg	4.01	0.814	--	--
PCB 138/163/164	2,2',3,4,4',5'-HxCB + 2,3,3',4',5,6-HxCB + 2,3,3',4',5',6-HxCB	ug/Kg	NA	11.5	--	--
PCB 139/140	2,2',3,4,4',6-HxCB + 2,2',3,4,4',6'-HxCB	ug/Kg	1.71	NA	--	--
PCB 139/149	2,2',3,4,4',6-HxCB + 2,2',3,4',5',6-HxCB	ug/Kg	NA	8.49	--	--
PCB 140	2,2',3,4,4',6'-HxCB	ug/Kg	NA	0.0296 U	--	--
PCB 141	2,2',3,4,5,5'-HxCB	ug/Kg	14.2	2.95	--	--
PCB 142	2,2',3,4,5,6-HxCB	ug/Kg	0.0494 U	NA	--	--
PCB 144	2,2',3,4,5',6-HxCB	ug/Kg	4.69	0.434	--	--
PCB 145	2,2',3,4,6,6'-HxCB	ug/Kg	0.0533	0.0296 U	--	--
PCB 146	2,2',3,4',5,5'-HxCB	ug/Kg	9.95	NA	--	--

IUPAC Number[1]	Chemical Name	Units	Calbag Sample 4927 NW Front FO080753 6/2/2008	LWG Basin 19 Sample Manhole AAP918 LW3-STW-S10-OF19 7/3/2007	JSCS[2] Screening Level Value (Toxicity)	JSCS[2] Screening Level Value (Bioaccumulation)
Chlorinated Biphenyl Congeners (EPA 1668A)						
PCB 146/165	2,2',3,4',5,5'-HxCB + 2,3,3',5,5',6-HxCB	ug/Kg	NA	1.52	--	--
PCB 147	2,2',3,4',5,6-HxCB	ug/Kg	NA	0.16	--	--
PCB 147/149	2,2',3,4',5,6-HxCB + 2,2',3,4',5',6-HxCB	ug/Kg	61.1	NA	--	--
PCB 148	2,2',3,4',5,6'-HxCB	ug/Kg	0.069	0.0296 U	--	--
PCB 150	2,2',3,4',6,6'-HxCB	ug/Kg	0.155	0.0296 U	--	--
PCB 151	2,2',3,5,5',6-HxCB	ug/Kg	NA	2.54	--	--
PCB 152	2,2',3,5,6,6'-HxCB	ug/Kg	0.0963	0.0296 U	--	--
PCB 153	2,2',4,4',5,5'-HxCB	ug/Kg	NA	12	--	--
PCB 153/168	2,2',4,4',5,5'-HxCB + 2,3',4,4',5',6-HxCB	ug/Kg	61	NA	--	--
PCB 154	2,2',4,4',5,6'-HxCB	ug/Kg	0.71	0.082	--	--
PCB 155	2,2',4,4',6,6'-HxCB	ug/Kg	0.0494 U	0.0296 U	--	--
PCB 156	2,3,3',4,4',5-HxCB	ug/Kg	NA	1.3	--	--
PCB 156/157	2,3,3',4,4',5-HxCB + 2,3,3',4,4',5'-HxCB	ug/Kg	16.3	NA	--	--
PCB 157	2,3,3',4,4',5'-HxCB	ug/Kg	NA	**0.256**	--	0.21
PCB 158	2,3,3',4,4',6-HxCB	ug/Kg	8.29	NA	--	--
PCB 158/160	2,3,3',4,4',6-HxCB + 2,3,3',4,5,6-HxCB	ug/Kg	NA	1.33	--	--
PCB 159	2,3,3',4,5,5'-HxCB	ug/Kg	0.0494 U	0.0296 U	--	--
PCB 160	2,3,3',4,5,6-HxCB	ug/Kg	0.0494 U	NA	--	--
PCB 161	2,3,3',4,5',6-HxCB	ug/Kg	0.0494 U	NA	--	--
PCB 162	2,3,3',4',5,5'-HxCB	ug/Kg	0.73	NA	--	--
PCB 164	2,3,3',4',5',6-HxCB	ug/Kg	5.89	NA	--	--
PCB 165	2,3,3',5,5',6-HxCB	ug/Kg	0.0494 U	NA	--	--
PCB 166	2,3,4,4',5,6-HxCB	ug/Kg	NA	0.0296 U	--	--
PCB 167	2,3',4,4',5,5'-HxCB	ug/Kg	**4.32**	**0.544**	--	0.21
PCB 168	2,3',4,4',5',6-HxCB	ug/Kg	NA	0.0296 U	--	--
PCB 169	3,3',4,4',5,5'-HxCB	ug/Kg	**0.216**	0.0552 U	--	0.00021
PCB 170	2,2',3,3',4,4',5-HpCB	ug/Kg	11.6	3.76	--	--
PCB 171	2,2',3,3',4,4',6-HpCB	ug/Kg	NA	1.07	--	--
PCB 171/173	2,2',3,3',4,4',6-HpCB + 2,2',3,3',4,5,6-HpCB	ug/Kg	4.49	NA	--	--
PCB 172	2,2',3,3',4,5,5'-HpCB	ug/Kg	2.22	0.605	--	--
PCB 173	2,2',3,3',4,5,6-HpCB	ug/Kg	NA	0.118	--	--
PCB 174	2,2',3,3',4,5,6'-HpCB	ug/Kg	15	3.91	--	--
PCB 175	2,2',3,3',4,5',6-HpCB	ug/Kg	0.735	0.84	--	--
PCB 176	2,2',3,3',4,6,6'-HpCB	ug/Kg	2.17	0.396	--	--
PCB 177	2,2',3,3',4',5,6-HpCB	ug/Kg	7.12	2.42	--	--
PCB 178	2,2',3,3',5,5',6-HpCB	ug/Kg	3.46	0.722	--	--
PCB 179	2,2',3,3',5,6,6'-HpCB	ug/Kg	7.36	1.74	--	--
PCB 180	2,2',3,4,4',5,5'-HpCB	ug/Kg	NA	8.69	--	--
PCB 180/193	2,2',3,4,4',5,5'-HpCB + 2,3,3',4',5,5',6-HpCB	ug/Kg	29.4	NA	--	--
PCB 181	2,2',3,4,4',5,6-HpCB	ug/Kg	0.118 EMPC	0.18	--	--
PCB 182	2,2',3,4,4',5,6'-HpCB	ug/Kg	0.0494 U	NA	--	--
PCB 182/187	2,2',3,4,4',5,6'-HpCB + 2,2',3,4',5,5',6-HpCB	ug/Kg	NA	4.21	--	--
PCB 183	2,2',3,4,4',5',6-HpCB	ug/Kg	NA	2.28	--	--
PCB 183/185	2,2',3,4,4',5',6-HpCB + 2,2',3,4,5,5',6-HpCB	ug/Kg	12.8	NA	--	--
PCB 184	2,2',3,4,4',6,6'-HpCB	ug/Kg	0.0585	0.0296 U	--	--
PCB 185	2,2',3,4,5,5',6-HpCB	ug/Kg	NA	0.652	--	--
PCB 186	2,2',3,4,5,6,6'-HpCB	ug/Kg	0.0494 U	0.0296 U	--	--
PCB 187	2,2',3,4',5,5',6-HpCB	ug/Kg	21.9	NA	--	--
PCB 188	2,2',3,4',5,6,6'-HpCB	ug/Kg	0.0702	0.0296 U	--	--
PCB 189	2,3,3',4,4',5,5'-HpCB	ug/Kg	0.849	0.137	--	1.2
PCB 190	2,3,3',4,4',5,6-HpCB	ug/Kg	1.9	0.588	--	--
PCB 191	2,3,3',4,4',5',6-HpCB	ug/Kg	0.514	0.118	--	--
PCB 192	2,3,3',4,5,5',6-HpCB	ug/Kg	0.0494 U	0.925	--	--
PCB 193	2,3,3',4',5,5',6-HpCB	ug/Kg	NA	0.337	--	--
PCB 194	2,2',3,3',4,4',5,5'-OcCB	ug/Kg	9.34	1.59	--	--
PCB 195	2,2',3,3',4,4',5,6-OcCB	ug/Kg	2.94	1.11	--	--
PCB 196	2,2',3,3',4,4',5,6'-OcCB	ug/Kg	6.24	NA	--	--
PCB 196/203	2,2',3,3',4,4',5,6'-OcCB + 2,2',3,4,4',5,5',6-OcCB	ug/Kg	NA	1.34	--	--

IUPAC Number[1]	Chemical Name	Units	Calbag Sample 4927 NW Front FO080753 6/2/2008	LWG Basin 19 Sample Manhole AAP918 LW3-STW-S10-OF19 7/3/2007	JSCS[2] Screening Level Value (Toxicity)	JSCS[2] Screening Level Value (Bioaccumulation)
Chlorinated Biphenyl Congeners (EPA 1668A)						
PCB 197	2,2',3,3',4,4',6,6'-OcCB	ug/Kg	NA	0.0903 UJ	--	--
PCB 197/200	2,2',3,3',4,4',6,6'-OcCB + 2,2',3,3',4,5,6,6'-OcCB	ug/Kg	2.25	NA	--	--
PCB 198	2,2',3,3',4,5,5',6-OcCB	ug/Kg	NA	0.196	--	--
PCB 198/199	2,2',3,3',4,5,5',6-OcCB + 2,2',3,3',4,5,5',6'-OcCB	ug/Kg	19	NA	--	--
PCB 199	2,2',3,3',4,5,5',6'-OcCB	ug/Kg	NA	1.56 UJ	--	--
PCB 200	2,2',3,3',4,5,6,6'-OcCB	ug/Kg	NA	0.303	--	--
PCB 201	2,2',3,3',4,5',6,6'-OcCB	ug/Kg	2.51	0.369	--	--
PCB 202	2,2',3,3',5,5',6,6'-OcCB	ug/Kg	3.88	0.613	--	--
PCB 203	2,2',3,4,4',5,5',6-OcCB	ug/Kg	11	NA	--	--
PCB 204	2,2',3,4,4',5,6,6'-OcCB	ug/Kg	0.0494 U	0.0296 U	--	--
PCB 205	2,3,3',4,4',5,5',6-OcCB	ug/Kg	0.514	0.0892	--	--
PCB 206	2,2',3,3',4,4',5,5',6-NoCB	ug/Kg	19.2	1.73	--	--
PCB 207	2,2',3,3',4,4',5,6,6'-NoCB	ug/Kg	2.22	0.153 J	--	--
PCB 208	2,2',3,3',4,5,5',6,6'-NoCB	ug/Kg	5.29	0.436 J	--	--
PCB 209	Decachlorobiphenyl	ug/Kg	4.89	1.06	--	--
	Total Monochlorobiphenyls	ug/Kg	1.1	0.578	--	--
	Total Dichlorobiphenyls	ug/Kg	59.4	5.79	--	--
	Total Trichlorobiphenyls	ug/Kg	470	19.3	--	--
	Total Tetrachlorobiphenyls	ug/Kg	657	33.3	--	--
	Total Pentachlorobiphenyls	ug/Kg	593	58.3	--	--
	Total Hexachlorobiphenyls	ug/Kg	372	54.5	--	--
	Total Heptachlorobiphenyls	ug/Kg	122	33.7	--	--
	Total Octachlorobiphenyls	ug/Kg	57.7	5.61	--	--
	Total Nonachlorobiphenyls	ug/Kg	26.7	2.32	--	--
	Total Decachlorobiphenyls	ug/Kg	4.89	1.06	--	--
	Total PCBs	ug/Kg	**2360**	**214**	676	0.39

Notes:

MoCB = Monochlorobiphenyl

DiCB = Dichlorobiphenyl

TriCB = Trichlorobiphenyl

TeCB = Tetrachlorobiphenyl

PeCB = Pentachlorobiphenyl

HeCB = Hexachlorobiphenyl

HpCB = Heptachlorobiphenyl

OcCB = Octachlorobiphenyl

NoCB = Nonachlorobiphenyl

J = The analyte was detected in the method blank at a concentration greater than twenty times the level found in the sample; therefore, the results is qualified as estimated.

U = The analyte was not detected above the reported sample quanitfication limit.

EMPC = Estimated maximum possible concentration.

NA = Not anlayzed.

-- 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

= concentration exceeds JSCS Toxicity Screening Level Value

Legend

- Storm Pipe
- Manhole
- Taxlots
- City Sample Point
- DEQ Environmental Cleanup Sites
- LWG Sample Point

Figure 1
Basin 19
Sediment Trap Sampling Locations

μ 0 50 100 200 Feet

Source: City of Portland BES

File Name: s:\gis\outfalls\outfalls_19\sampling_figure1.mxd

Sheet No. 1 OF 1

ENVIRONMENTAL SERVICES CITY OF PORTLAND 1120 SW Fifth Avenue, Room 1000 Portland, Oregon, 97204-1912

Program Manager: Dawn Sanders
Portland Harbor Superfund

Date Printed: 02/12/2009

Prepared by: Sara Gardner

Attachment A
Field and Laboratory Photographs

Photo 1. Inline sediment traps installed in lateral connection that discharges from the Calbag site to the City stormwater line in NW Kittridge Avenue. This photograph was taken during the installation of the Spring 2007 sediment traps. No photographs were taken during the installation of the Winter 2007/2008 sediment traps because of an equipment malfunction. Both sets of sediment traps were installed in the same exact location, shown in this photo.

Photo 2 (January 9, 2008). Inline sediment traps during January 2008 monthly field monitoring.

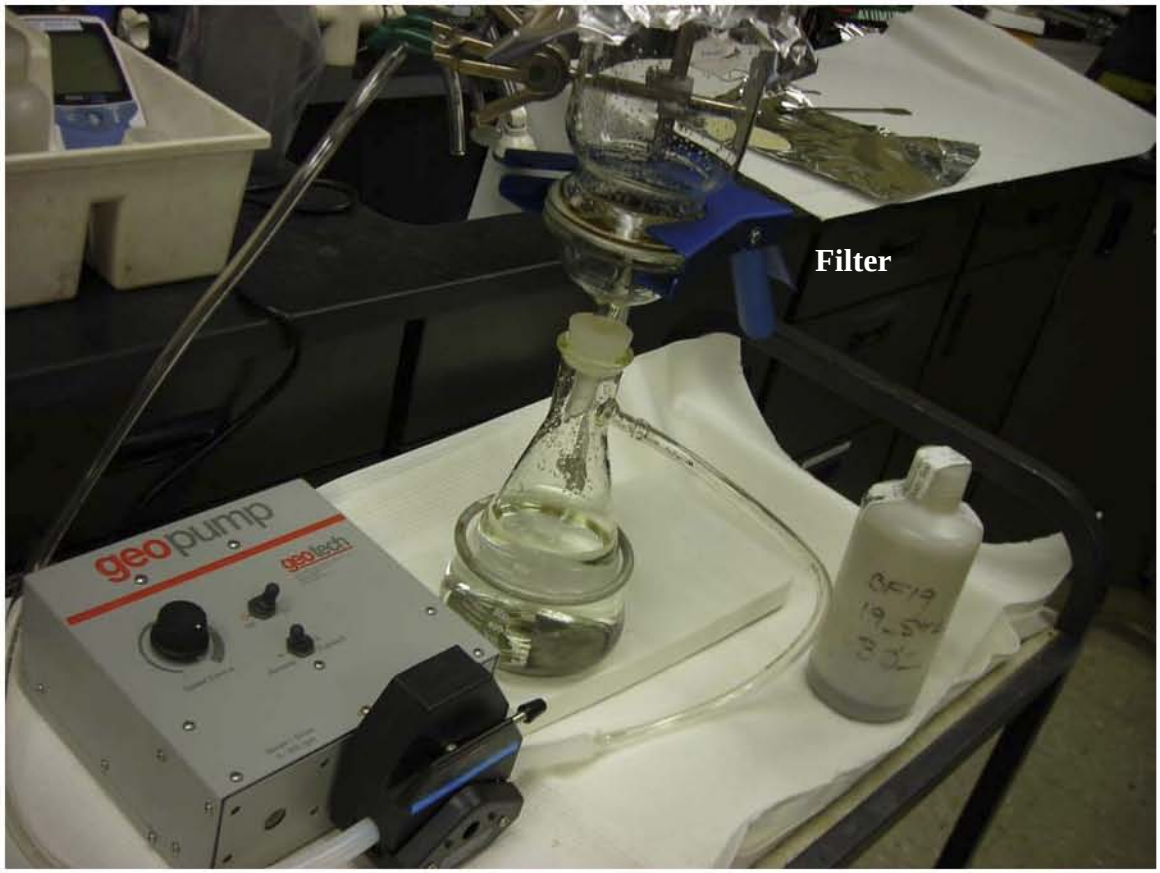


Photo 3 (June 4, 2008). Laboratory setup for removing solids collected in the sediment trap. The two sediment trap containers were full of water and had approximately 0.6 inches (upstream bottle) and 0.3 inches (downstream bottle) of sediment accumulated in the bottom. The contents of the sediment trap were poured into the top of this filtering assembly and negative air pressure forced the water through the filter. The solids that remained on the filter were composited and analyzed for PCBs, total solids, and TOC.

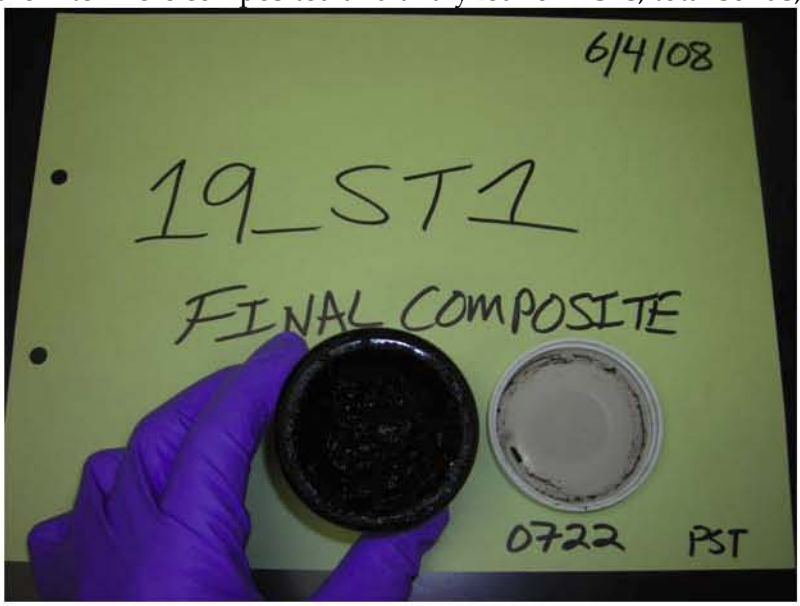


Photo 4 (June 4, 2008). Final composite sediment sample from the two sediment traps.

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: 11/26/07	By: DJH
Site Address: ~~4927~~ NW FRONT (CALBAG SAMPLING M.H.)	Pt Code: 19_ST_1	Basin: 19	Hansen ID: N/A - PRIVATE

SECTION 1 – INSTALLATION INFORMATION

Traffic control and/or site access concerns:

NO TRAFFIC, M.H IS NEAR LOADING RAMP SO PARKED TRUCKS COULD BE A PROBLEM

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

NO BASEFLOW OR STANDING WATER. NO SIGN OF RIVER BACKUP

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

NO SEDIMENT IN PIPE

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

USED SAME BOLTS AS SPRING 07 INSTALL.
BOTTLE 1 = 15" DOWNSTREAM OF D.S. MH WALL
BOTTLE 2 = 7" DOWNSTREAM OF D.S. MH. WALL

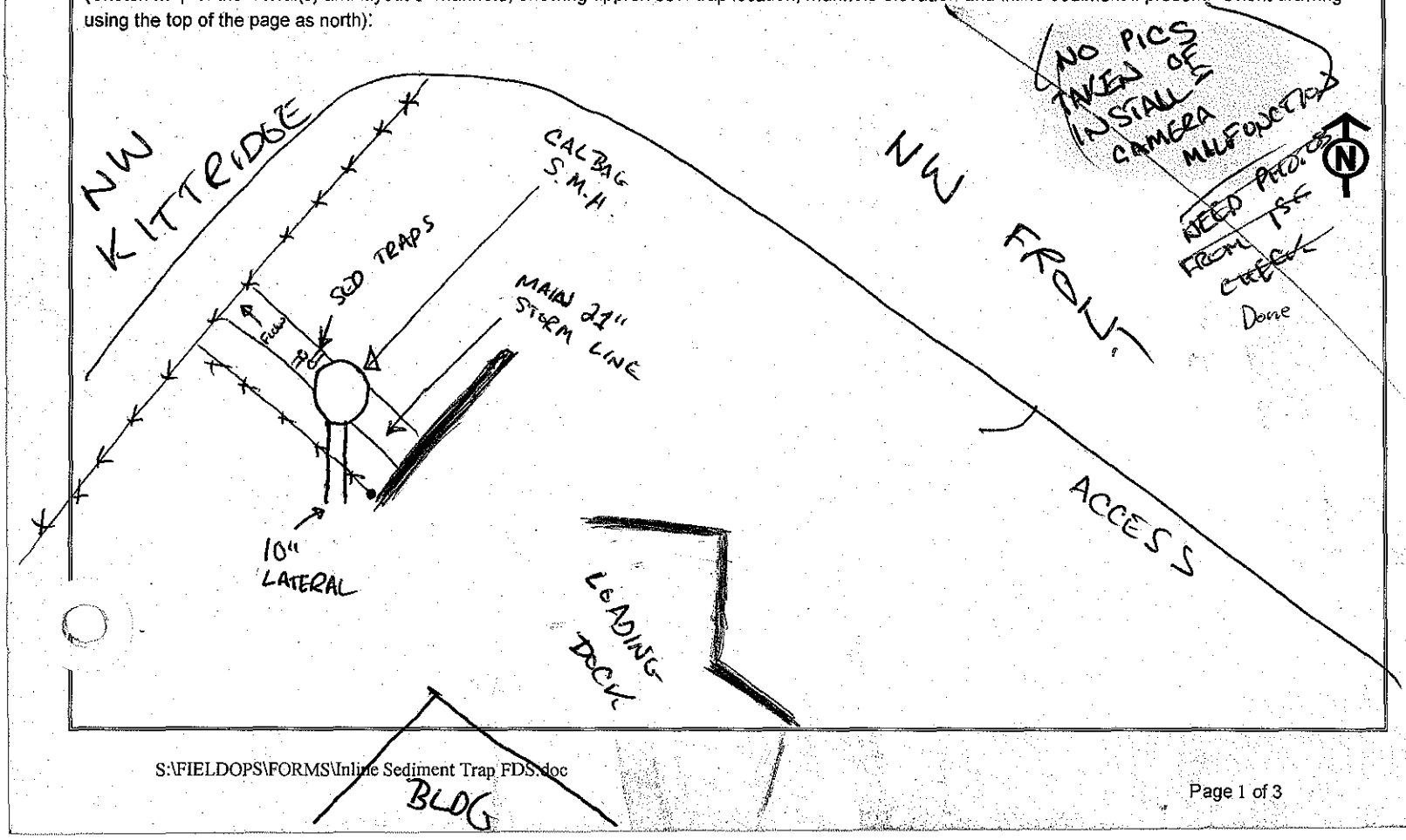
Sed trap bottles installed on: 11/26/07

Pipe diameter (inches): 21"

Distance from MH node (feet): w 1 FT

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):



City of Portland
Environmental Services

DAILY FIELD REPORT

Page 1 of 1

Project PORTLAND HARBOR STORMWATER Project No. 1020.005
Location 4297 NW FRONT (CALBAG) Date 11/26/07
Subject SED TRAP INSTALL By DJH

W1000 - DJH/NCR ARRIVE TO INSTALL SED TRAP W/ BOTTLE IN SAME LOCATION AS SPRING '07 = DOWNSTREAM FROM PRIVATE M.H. (NO HANSEN ID) NEAR LOADING RAMP AT N.W. CORNER OF PROPERTY ("CALBAG SAMPLING M.H.") 19-ST1 JXB

USED SAME BOLTS FROM PREVIOUS INSTALL SO TRAPS ARE LOCATED IN IDENTICAL LOCATION AS SPRING 2007 = 15" + 7" DOWN STREAM OF M.H.

INSTALLED PRECLEANED BOTTLES AND REMOVED CAPS.

SEE F.D.S. FOR MORE INFO.

W1130 OFF SITE.

VERY COLD DAY!

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project Portland Harbor Stormwater
Location OF53A sites; OF 19 Caisson
Subject MONTHLY SED TRAP INSPECTIONS

Project No. 1020.005
Date 12/17/07
By LAP/RCB

1426: Off-site.

1450 Arrive @ OF_19_ST1. Overcast, cold, windy, and raining very lightly. Very small amount of flow trickling in center of invert. Very fine layer of silt in pipe. No organic debris on traps.

1457 Bottles capped, then removed.

1502 Photo'd bottle ~~OF~~ 19-ST1-B01

1504 " " " " -B02

Bottle B01 had only a trace of sediments present, while B02 had ~0.25" inch. Both bottles had slightly turbid water and each were full of SW. No odor.

1509: Bottles placed back in housing, secured, gloves changed, caps removed.

1515 Offsite to WPCL

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project Portland Harbor Stormwater Mon
Project No. 1020.005
Location OF 16, 19, 22B
Date 1/9/08
Subject Monthly In-Line Sed Trap Checks
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 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. (Downstream)

1317: Bottle 22B_ST1_B1 photographed. Approx. 1" of 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 (Upstream)

1333 Offsite

1356 – Arrive on site @ 19_ST1 (4927 NW Front Ave.). RCB enters private Calhag 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 →

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project PORTLAND HARBOR STORMWATER MON. Project No. 1020.005

Location OF 16, 19, & 22B Date 1/9/08

Subject MONTHLY IN-LINE SED TRAP CHECKS By JXB)RCB

1412 - Downstream bottle 19-ST1-B1 photographed. Approx. 0.1" (<1% by volume) of accumulated sediment in sed trap bottle. Bottle is full of stormwater.

1415 - Upstream bottle 19-ST1-B2 photographed. Approx. JXB ~~3.5"~~ 0.35" (~~<3.5%~~ <3.5% by volume) of sediment accumulated in sed trap bottle. Bottle is full of stormwater.

Sed traps have accumulated increased quantities of sed following last month's sed trap check @ this location. Sediment is dark gray-to-black. Downstream 19-ST1-B1 accumulated sed appears to be primarily in suspension, whereas, upstream 19-ST1-B2 has solid sed/amalgamations in the bottom (0.1-0.2" of the bottle) w/ the rest of the accumulated sed. in suspension.

Stormwater in the sed trap bottles is light gray, turbid w/ no odor

1425 - Left 19-ST1 for WPCL.

Attachments

Project PORTLAND HARBOR STORMWATER SAMP. Project No. 1020.005
Location OF16(non TC), 19, & 22B Date 2/13/08
Subject MONTHLY IN-LINE SED TRAP CHECKS By JXB/RCB

16-ST3 (cont.)

RCB notes increased flow regime downstream of 16-ST2 sed traps. Increased flow regime is most likely due to southwest lateral baseflow input. Baseflow @ 16-ST3 sed trap location was approx. 0.4" & 0.5 fps. Organic debris & plastic collected around both sed traps (primarily collecting around sed trap housing. RCB notes leaf adhered to upstream sed trap bottle neck. Both sed trap bottle mouths are free of abstructions & debris.

RCB carefully removes leaf adhered to upstream sed trap bottle neck, in order to cap sed trap bottle. Sed trap bottles capped & removed from sed trap housing. Upstream bottle (16-ST3-B2) had approx. 0.3" (<3% by volume) of captured sediment w/ trace amounts of sed adhered to the inside of the bottle wall. Downstream bottle (16-ST3-B1) had approx. 0.25" (<2.5% by volume) of captured sed w/ trace amounts of sed adhered to the inside bottle wall. Both sed trap bottles were full of stormwater. Captured stormwater was slightly turbid w/ no observable odor or sheen.

JXB Secured bottles in sed trap housing & removed bottle caps. No photos taken of sed traps in-situ. Left site for Basin 19

1004 - Arrive on site @ 19-ST1 Calbag sed trap location (4927 NW Front Ave.) to conduct monthly in-line sed trap checks. RCB to enter Calbag private manhole. RCB inspects sed traps

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project PORTLAND HARBOR STORMWATER SAMP. ~~MON.~~ JXB
Project No. 1020.005
Location OF 16(non TC), 19, & 22B
Date 2/13/08
Subject MONTHLY IN-LINE SED TRAP CHECKS
By JXB/RCB

19-ST1 (cont.)

Unusual elevated flow conditions occuring in line upon arrival (visual observation of flow was approx. 0.3-0.4" in depth & approx. 2 fps). RCB investigates potential source. RCB observed freshly washed box truck through east gate, along the east side of the Calbag building. Standing water around box truck flowing into CB. Elevated flow conditions subside prior to RCB entering manhole.

Baseflow after entry was approx. 0.1" & 1.0 fps. Organic debris (minor amounts) collecting around both sed trap base plates, as well as downstream of sed traps. Upstream bottle (19-ST1-B2) had approx. 0.4" (<4% by volume) of captured sed w/ abundant sed adhered to the inside bottle wall. Downstream bottle (19-ST1-B1) had approx. 0.1" (<1% by volume) of captured sed w/ no sed adhered to the inside wall of the bottle.

Both bottles were full of stormwater. No observable sheen or odor present. The upstream bottle stormwater was slightly more turpid compared to the downstream sed trap bottle stormwater captured by the traps. RCB notes trace amounts of sed adhered to the inside bottle neck of the upstream bottle.

Secured sed trap bottles in sed trap housing & removed bottle caps. Two photos were taken of elevated flow conditions from manhole surface. Left 19-ST1 for Basin 22B.

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project Portland Harbor Stormwtr Samp
Project No. 1020.005
Location NW PDX
Date 3/19/08
Subject March Sed. Trap checks
By JTM, LAP

0928 Arrive at 19-STI. Weather is dry, cool and sunny. Entrant LAP observes minimal baseflow ~0.1" in depth. Sed. traps are free and clear of any debris accumulation. Entrant found metal scraps accumulated above pipe, around shoulder in manhole. Captured photo. Entrant also found a larger metal shaving lodged under trap base. Captured photo. Entrant collected sample of scraps/shavings for additional review by JKB, DTH @ WPCL.

Entrant capped bottles. Entrant also observed tree roots ~2 4' DS of traps that have collected organic debris. Entrant passed bottles to attendant.

- 19-STI-Bottle 1 – bottle full of stormwtr, very slight turbidity. Fine trace sed. adhering to inner bottle surfaces. ~~No~~ very slight sheen or ~~no~~ odor. Sed. depth is 0.14". (DS) (visible sp visible)
- 19-STI-Bottle 2 - bottle full of slightly turbid stormwtr. Slight sheen, yet no noticable odor. Bottle has trace fine sed. adhering to inner surfaces ~~and film~~ which appear brown in color - possibly iron deposit. Captured photo depicting color differences betwn bottle 1 and bottle 2. Bottle 2 sed. depth is ~0.35". (VS)

Entrant noted fine sed. deposited in line as far as ~~visable~~ visible.

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

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

1021 PST Arrive @ 19-ST1. Light showers occuring @ site upon arrival. Entrant confirms that bottle necks, sed. trap housing & bottle mouths are free and clear of debris

NOTE: Metal punchouts are still present along shoulder of manhole invert; however, there is no new metal shavings along invert &/or against sed. trap housing, as obsenved during last month's sed trap check.

Entrant capped & removed sed trap bottles (B1 & B2).

- Upstream bottle (B2) had approx ~~0.2"-0.3"~~ 0.6"-0.7" JXB (<3% by volume) of accumulated sed. Sediment trap bottle was full of slightly turbid stormwater w/ no odor or sheen present
- Downstream bottle (B1) had approx. 0.2"-0.3" (<3% by volume) of accumulated sed. All other descriptions & Charcteristics the same as noted for B2.

Entrant secured sed. trap bottles & removed bottle caps.

1048- Left 19-ST1 for Basin 16.

1100- Arrive @ 16-ST2 & 16-ST3

1105- Entrant inspects inline sed. traps 16-ST3. Entrant noks presence of organic debris & plastics around sed. trap housing. Entrant confirms bottle necks & bottle mouths are free & clear of debris

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

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. ≤ 0.6" of sed. captured.
Downstream bottle (B1) - Had approx ≤ 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

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: JTM	Sample Pt. Code: 19_STI-B1 ; B2	Removal Date: 28 JXS 5/22/2008	Processing Date: 6/2/2008
Basin: **19**	Hansen ID: N/A - private		Subbasin: N/A
Sediment Trap Location Description/Address: 4927 NW Front Bottle 1 (19-STI-B1) located approximately 15" downstream of D.S. MH wall. Bottle 2 (19-STI-B2) located 7" downstream of D.S. MH. wall.			

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, 1-5µm P4, (4-8µm) for B2

Sediment Trap Bottle ID: 19 - STI - B1 -	**Sediment Trap Bottle ID:** 19 - STI - B2 -
Total Est. Depth of Accumulated Sed in Bottle (inches): ≤0.3"	Total Est. Depth of Accumulated Sed in Bottle (inches): ≤0.6"
Sample Processing Start Time: 1040 / Sample Processing End Time: 1224	Sample Processing Start Time: 1350 / Sample Processing End Time: 1525
Number of Filters Used: 4 P2(1-5µm) JXS	Number of Filters Used: 5 P2(1-5µm), 10 P4(4-8µm)
Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): 125 mL	Est. total volume of Ultra Pure DI used to remobilize adhered stormwater solids within bottle in milliliters (mL): 145 mL
Tare Weight [empty jar in grams (g)]: 133.4 Dewatered/Filtered Sed. Weight (g): 6.4	Tare Weight [jar and filtered sed. from Bottle1 in grams (g)]: 6.4 Dewatered/Filtered Sed. Weight (g): 26.7
Sample Processing Notes/Comments: Sed. is very fine. Filtrate water is mostly clear w/ minimal odor	Sample Processing Notes/Comments: Filtrate water mostly clear, yellowish in color w/ strong organic odor

Visual Description of Final Composite Sample: very fine, black sediment

COC Time (time composite jar is capped): 1528 PST JXS	Total Dewatered/Filtered Sed. Weight in grams (g): 33.1g	Sample Jars Collected (number, size, full or partial): 1x partially filled 8-oz jar JXS
Sample ID affix FO num FO 080753	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:	

City of Portland
Environmental Services

DAILY FIELD REPORT

Page 1 of 1

Project Portland Harbor Stmwtr Samp
Location WPCL Field Lab
Subject Inline Sed. Trap Sample Processing

Project No. 1020.005
Date 6/2/08
By JTM

1030 PST Assemble decon'd filter apparatus w/ Fisher Scientific P2 (1-5μm) filter paper. Geopump outfitted w/ Masterflex 1/4" Tygon tubing w/ ~6" section of Versilic Silicone SPX-50 tubing for peristaltic pump rollers - geopump would not function w/ Masterflex. Flushed peristaltic tubing w/ DI & UPDI JXB

1040 Captured photo of 19-STI-B1 adjacent to dry erase board. Initiated filtering. Flow through rate is moderate. Filtrate is clear, void of any discernable color.

1148 Captured photo of filter paper #3 w/ sediment

1224 Completed filtering 19-STI-B1, captured photo of filter papers.

1340 Primed apparatus for 19-STI-B2 w/ P2 filter, captured photo of 19-STI-B2 adjacent to dry erase board.

1350 Initiated filtering process. Noticable sheen on supernatant surface, filtrate yellowish, clear.

1403 Flow through appears slow, switched to Fisher Scientific P4 (4-8μm) filter paper for 3rd filtration.

1410 Slow, non-existent flow through continues to hinder filtration process. Further inspection of pump housing shows that silicone tubing has ruptured due to heat : stress. Replaced silicone section and changed pumps. Now using Sigma portable peristaltic pump.

1421 Filter paper #3 ruptured due to wrong direction. Assemble apparatus w/ P2 (1-5μm) paper for 4th filtration

1428 Switched back to P4 (4-8μm) filter paper prior to 7th filtration and used P4 papers through last filtration (15th).

1525 Completed filtration.

JXB 6/4/08

NOTE: Photos of the final composite were not taken @ the end of the 6/2/08 ~~Attachments~~ Processing. Final composite photos were taken on 6/4/08

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

Project Name: PORTLAND HARBOR STORMWATER SAMP

File Number: 1020.005 - Matrix: DIWTR

Field Comment - performed an equipment blank on 90 mm, glass microfiltration assembly, with stainless steel support, at the WPCL Field Lab for FY 2007-2008 sed. trap processing. Microfiltration assembly was decontaminated according to Field Operations Standard Operating Procedure (SOP) 7.01a. Microfiltration equipment was allowed to air-dry overnight prior to filtering ultra-pure DI through the filtration assembly.

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General: PAH + Phthalates (low-level)	General: Phthalates JXB 5/14/08	Metals: Total Metals (Al, Sb, As, Cd Cr Cu, Pb, Mn, Ni, Ag, Zn) + Hg	Field
FO 080655	EQUIPMENT BLANK	EQBLANK	5/13/08	1531	G	•		•	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature:	Signature:	Signature:	Signature:
Time: 1534	Time:	Time:	Time:
Printed Name: Jeremiah Bawden	Printed Name:	Printed Name:	Printed Name:
Date: 5/13/08	Date:	Date:	Date:
Received By: 1.	**Received By: 2.**	**Received By: 3.**	**Received By: 4.**
Signature:	Signature:	Signature:	Signature:
Time:	Time:	Time:	Time:
Printed Name:	Printed Name:	Printed Name:	Printed Name:
Date:	Date:	Date:	Date:

City of Portland
Environmental Services

DAILY FIELD REPORT

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 Versi-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 the full decon procedure minus a nitric dip. This deviation JXB from the 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) to microfiltration system side-arm beaker & attached tubing to 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 & 90 mm cellulose, Grade P2, 1-5 µm filter paper, installed in microfiltration system.

1541 - Filled 1x 1L amber glass bottle & 1x pre-cleaned nalgene metals bottle w/ UPDI water filtrate for EQBLANK analysis (Total metals (PAH + Phthalates)

Attachments

1554 - Relinquished EQBLANK sample.

FO 080655

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 microfiltration 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? → see work order JXB 5/7/08 (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	☒ 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.

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? (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? (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	→ see work order OXB 5/7/08 ☒ 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.

Attachment C
Laboratory Results

GSI Water Solutions, Inc.
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
City Outfall Basin 19

To: Dawn Sanders, City of Portland, Bureau of Environmental Services (BES)
Linda Scheffler (BES)

From: Karen Demsey, GSI Water Solutions, Inc.

Date: December 8, 2008

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated for chemical analysis of inline solids obtained during source investigation activities conducted in winter 2008 by the City of Portland in Outfall Basin 19. The results of the sampling and analysis are presented in the Technical Memorandum No. OF19-2.

The laboratory analysis of the Basin 19 sediment sample was conducted by the City's Water Pollution Control Laboratory (WPCL), TestAmerica of Beaverton, Oregon, and Pace Analytical Services, Inc., of Minneapolis, Minnesota. The sample was analyzed for the following:

- Total Solids (SM 2540 G)
- Total Organic Carbon (TOC) (EPA 9060 MOD)
- Polychlorinated Biphenyl (PCB) Congeners (EPA 1668A)

The laboratory data reports for analysis of this sample are included along with this QA/QC review in Attachment C to Technical Memorandum No. OF 19-2.

This QA/QC review of the analytical data, based upon the available documentation supplied by the laboratory, consisted of reviewing the following:

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

- If applicable, laboratory control sample and duplicate laboratory control sample recoveries within control limits

The results of the laboratory report QA/QC review 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 acceptable holding times for all analyses. No chemical analytical data are qualified.

Method Blanks

Laboratory method blanks were processed during the laboratory analysis of PCBs and TOC. TOC was not detected in the method blank. Pace Analytical Services reports the detection of several PCB congeners in the method blank for analysis of PCB congeners. Because the detections in the field sample were greater than ten times the concentrations detected in the method blank, Pace reports that the analytical process thus did not introduce significant levels of PCB congeners to the sample extracts and no chemical analytical data are qualified.

Laboratory Control Spike

A laboratory control spike sample was processed during the laboratory analysis of PCBs and TOC. All recoveries were within laboratory control limits, and the data are not qualified.

Internal Standard Recoveries

Internal standard recoveries were processed during the laboratory analysis of PCB congeners. The recoveries were within control limits with five exceptions. Pace Analytical reports that the data were automatically corrected for variation in recovery and that accurate values were obtained. Therefore, no data are qualified.

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

OF 19 Sediment Trap

Sediment traps installed: 11/26/07; removed: 5/28/08
*Total Solids to be done at WPCL, care should be taken to use the smallest aliquot possible to retain sample volume for additional follow-up analyses.

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General: PCB Congeners (All 209)	General: TOC	General: TS*	General: PAH + Phthalates (Low-level)	General: Organo-chlorine Pesticides	General: Herbicides	Metals: Total Metals (Al, Sb, As, Cd Cr Cu, Pb, Mn, Ni, Ag, Zn) + Hg	Comments
												Added for PAH 6/12/08	
FO 080753	ST-19-CALBAG-0608 4927 NW FRONT AVE	19_ST1	6/2/08	1528	C	X	X	•					%solids=46.2 33.1 g Total Wet Weight

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature:	Signature:	Signature:	Signature:
Time: 1605 1405 PST	Time:	Time:	Time:
Printed Name: Jeremiah Bawden	Printed Name:	Printed Name:	Printed Name:
Date: 6/9/08	Date:	Date:	Date:
Received By: 1.	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature:	Signature:	Signature:	Signature:
Time: 1605	Time:	Time:	Time:
Printed Name: KRISS DENNIS	Printed Name:	Printed Name:	Printed Name:
Date: 6/9/08	Date:	Date:	Date:

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

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: **FO080753** **Sample Collected:** 06/02/08 15:28 **Sample Received:** 06/09/08 **Sample Status:** COMPLETE AND VALIDATED

Proj./Company Name:	PORTLAND HARBOR STORMWATER SAMP	**Report Page:**	Page 1 of 1
Address/Location:	ST-19-CALBAG-0608 4927 NW FRONT AVE - CALBAG SMH/DS OF MH	**System ID:**	AM05571
Sample Point Code:	19_ST1	**EID File # :**	1020.005
Sample Type:	COMPOSITE	**LocCode:**	PORTHASW
Sample Matrix:	SEDIMENT	**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.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	46.2	% W/W	0.01	SM 2540 G	06/10/08
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	159000	mg/Kg dry wt	100	EPA 9060 MOD	06/24/08
POLYCHLORINATED BIPHENYL CONGENERS -PACE					
Refer to Contract Report	Completed	ng/Kg dry wt		EPA 1668 MOD	06/30/08

End of Report for Sample ID: FO080753

Report Date: 08/05/08 **Validated By:**

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

www.pacelabs.com

Report Prepared for:

Howard Holmes
Test America
9405 SW Nimbus Avenue
Beaverton OR 97008

Report Information:

Pace Project #: 1075272
Sample Receipt Date: 06/17/2008
Client Project #: PRF0542
Client Sub PO #: N/A
State Cert #: MN200001-004

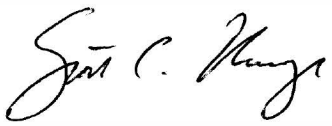
REPORT OF LABORATORY ANALYSIS FOR PCBs

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 Prepared Date:
July 24, 2008

Report of Laboratory Analysis

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

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on one sample submitted by a representative of Test America - Portland. The sample was analyzed for the presence or absence of polychlorinated biphenyl (PCB) congeners using USEPA Method 1668A. Reporting limits were set to approximately 50 parts per trillion and were adjusted for sample volume.

The isotopically-labeled PCB internal standards in the sample extract were recovered at 12-143%. With five 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. Analyte levels exhibiting isotope ratios outside of the acceptance ranges were flagged "I" on the results table.

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 sample contained these analytes at levels over ten times the levels found in the method blank. In general, levels less than ten times the background are not considered statistically different from the background. This demonstrates that the analytical process did not introduce significant levels of PCB congeners to the sample extracts.

A laboratory spike sample was 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 95-130%. These results indicate a high degree of accuracy for these determinations. Matrix spikes were prepared using a separate sample from this extraction batch. Results are available upon request.

Appendix A

Sample Management

1127

SUBCONTRACT ORDER

TestAmerica Portland

PRF0542

1075272

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

Copy/Relog from PRF0541.

Analysis	Units	Due	Expires	Comments
Sample ID: PRF0542-01	**Other wet**		Sampled: **06/02/08 15:28**	001
1668 Coplanar PCBs - SUB	ug/l	06/26/08	11/29/08 15:28	***209 Congeners*** to Pace
Containers Supplied: 4 oz. jar (B)				FO 080753

Jamie [signature]	6/16/08 14:46	[signature] pace	6/17/08 9:12 Temp= 1.6°C
Released By	Date/Time	Received By	Date/Time
Released By	Date/Time	Received By	Date/Time

Sample Condition Upon Receipt

Pace Analytical

Client Name: Test America Project # 1075272

Courier: ☐ Fed Ex ☐ UPS ☒ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 121AE 597 0 4216 6642

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____

Thermometer Used 230194010, 72310129 Type of Ice: Wet (Blue) None ☐ Samples on ice, cooling process has begun

Cooler 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. 6/17/08
Sample Labels match COC:	☑Yes	☐No	☒N/A	12.
-Includes date/time/ID/Analysis Matrix: Soil				
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: _____ **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 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	PRF0542-01 ; FO 080753		
Lab Sample ID	1075272001		
Filename	P80722A_18		
Injected By	SMT		
Total Amount Extracted	21.9 g	Matrix	Solid
% Moisture	53.8	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	06/02/2008
ICAL ID	P80722A08	Received	06/17/2008
CCal Filename(s)	P80722A_07	Extracted	06/30/2008
Method Blank ID	BLANK-16815	Analyzed	07/23/2008 05:56

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery	
Labeled Analytes							
13C-2-MoCB	1	8.176	3.22	2.0	0.240	12	P
13C-4-MoCB	3	11.519	3.41	2.0	0.600	30	
13C-2,2'-DiCB	4	11.855	1.65	2.0	0.372	19	P
13C-4,4'-DiCB	15	20.027	1.56	2.0	1.17	59	
13C-2,2',6-TrCB	19	16.277	1.19	2.0	0.550	27	
13C-3,4,4'-TrCB	37	28.482	1.14	2.0	1.27	63	
13C-2,2',6,6'-TeCB	54	20.332	0.81	2.0	1.14	57	
13C-3,4,4',5-TeCB	81	36.028	0.84	2.0	0.435	22	P
13C-3,3',4,4'-TeCB	77	36.615	0.80	2.0	0.429	21	P
13C-2,2',4,6,6'-PeCB	104	27.023	1.66	2.0	2.85	143	
13C-2,3,3',4,4'-PeCB	105	40.355	1.51	2.0	0.750	37	
13C-2,3,4,4',5-PeCB	114	39.684	1.50	2.0	0.727	36	
13C-2,3',4,4',5-PeCB	118	39.147	1.47	2.0	0.878	44	
13C-2,3',4,4',5'-PeCB	123	38.779	1.48	2.0	0.900	45	
13C-3,3',4,4',5-PeCB	126	43.658	1.45	2.0	0.646	32	
13C-2,2',4,4',6,6'-HxCB	155	33.462	1.36	2.0	2.56	128	
13C-HxCB (156/157)	156/157	46.761	1.33	4.0	2.17	54	
13C-2,3',4,4',5,5'-HxCB	167	45.604	1.35	2.0	1.23	61	
13C-3,3',4,4',5,5'-HxCB	169	50.165	1.10	2.0	0.956	48	
13C-2,2',3,4',5,6,6'-HpCB	188	39.617	1.00	2.0	2.57	129	
13C-2,3,3',4,4',5,5'-HpCB	189	52.703	0.93	2.0	1.43	71	
13C-2,2',3,3',5,5',6,6'-OcCB	202	45.235	0.89	2.0	1.77	88	
13C-2,3,3',4,4',5,5',6-OcCB	205	55.290	0.87	2.0	1.22	61	
13C-2,2',3,3',4,4',5,5',6-NoCB	206	56.993	0.74	2.0	1.15	57	
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	52.078	0.78	2.0	1.41	71	
13C--DeCB	209	58.545	0.78	2.0	1.40	70	
Cleanup Standards							
13C-2,4,4'-TrCB	28	23.786	1.07	2.0	1.82	91	
13C-2,3,3',5,5'-PeCB	111	36.716	1.76	2.0	0.850	42	
13C-2,2',3,3',5,5',6-HpCB	178	42.870	1.13	2.0	1.32	66	
Recovery Standards							
13C-2,5-DiCB	9	14.767	1.52	2.0	NA	NA	
13C-2,2',5,5'-TeCB	52	25.966	0.79	2.0	NA	NA	
13C-2,2',4,5,5'-PeCB	101	33.731	1.62	2.0	NA	NA	
13C-2,2',3,4,4',5'-HxCB	138	42.401	1.23	2.0	NA	NA	
13C-2,2',3,3',4,4',5,5'-OcCB	194	54.794	0.95	2.0	NA	NA	

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
Nn = Value obtained from additional analyses

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

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	PRF0542-01 ; FO 080753
Lab Sample ID	1075272001
Filename	P80722A_18

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		8.188	3.02	406	---	49.4
2		11.268	2.66	199	---	49.4
3		11.543	2.98	500	---	49.4
4		11.879	1.61	7980	---	49.4
5		15.737	1.78	146	---	49.4
6		15.342	1.50	4150	---	49.4
7		15.018	1.47	693	---	49.4
8		15.941	1.48	20500	---	49.4
9		14.791	1.49	1210	---	49.4
10		12.142	1.61	206	---	49.4
11		19.272	1.43	7110	---	59.3
12	12/13	19.632	1.46	1860	---	49.4
13	12/13	19.632	1.46	(1860)	---	49.4
14		---	---	ND	---	49.4
15		20.051	1.47	15500	---	49.4
16		19.920	1.05	20800	---	49.4
17		19.380	1.04	33300	---	49.4
18	18/30	18.841	1.05	64400	---	49.4
19		16.301	1.07	4880	---	49.4
20	20/28	23.820	0.99	100000	---	59.3
21	21/33	24.071	0.99	50400	---	49.4
22		24.541	0.99	31200	---	49.4
23		22.428	0.98	126	---	49.4
24		19.764	1.40 I	---	681	49.4
25		23.082	0.99	7440	---	49.4
26	26/29	22.797	0.99	18900	---	49.4
27		19.644	1.06	5050	---	49.4
28	20/28	23.820	0.99	(100000)	---	59.3
29	26/29	22.797	0.99	(18900)	---	49.4
30	18/30	18.841	1.05	(64400)	---	49.4
31		23.468	0.99	85400	---	49.4
32		20.634	0.99	23600	---	49.4
33	21/33	24.071	0.99	(50400)	---	49.4
34		22.244	0.99	344	---	49.4
35		28.046	1.15	1360	---	49.4
36		26.453	1.03	53.6	---	49.4
37		28.515	1.02	22500	---	49.4
38		27.492	1.28 I	---	54.3	49.4
39		26.872	1.07	331	---	49.4
40	40/41/71	28.247	0.77	49700	---	49.4
41	40/41/71	28.247	0.77	(49700)	---	49.4
42		27.710	0.76	24000	---	49.4
43		26.251	0.77	4110	---	49.4
44	44/47/65	27.107	0.78	80100	---	59.3
45	45/51	23.870	0.77	22000	---	49.4
46		24.222	0.77	6630	---	49.4
47	44/47/65	27.107	0.78	(80100)	---	59.3
48		26.872	0.77	19700	---	49.4

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
Nn = Value obtained from additional analyses

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

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 PRF0542-01 ; FO 080753
Lab Sample ID 1075272001
Filename P80722A_18

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	26.553	0.78	52000	---	49.4
50	50/53	23.065	0.77	18100	---	49.4
51	45/51	23.870	0.77	(22000)	---	49.4
52		25.983	0.77	118000	---	49.4
53	50/53	23.065	0.77	(18100)	---	49.4
54		20.365	0.83	130	---	49.4
55		---	---	ND	---	49.4
56		32.540	0.78	22300	---	49.4
57		30.293	0.79	98.6	---	49.4
58		30.595	0.78	184	---	49.4
59	59/62/75	27.492	0.77	8160	---	49.4
60		32.792	0.75	14200	---	49.4
61	61/70/74/76	31.484	0.76	111000	---	49.4
62	59/62/75	27.492	0.77	(8160)	---	49.4
63		31.115	0.75	2350	---	49.4
64		28.532	0.78	35400	---	49.4
65	44/47/65	27.107	0.78	(80100)	---	59.3
66		31.836	0.76	56200	---	49.4
67		30.813	0.76	2350	---	49.4
68		29.907	0.66	203	---	49.4
69	49/69	26.553	0.78	(52000)	---	49.4
70	61/70/74/76	31.484	0.76	(111000)	---	49.4
71	40/41/71	28.247	0.77	(49700)	---	49.4
72		29.589	0.74	466	---	49.4
73		---	---	ND	---	49.4
74	61/70/74/76	31.484	0.76	(111000)	---	49.4
75	59/62/75	27.492	0.77	(8160)	---	49.4
76	61/70/74/76	31.484	0.76	(111000)	---	49.4
77		36.649	0.77	7800	---	49.4
78		---	---	ND	---	49.4
79		34.972	0.77	1470	---	49.4
80		---	---	ND	---	49.4
81		36.062	0.92 I	---	257	49.4
82		36.179	1.63	9270	---	49.4
83		34.217	1.55	3920	---	49.4
84		31.601	1.56	26600	---	49.4
85	85/116/117	35.676	1.60	11900	---	59.3
86	86/87/97/108/119/125	34.972	1.56	60200	---	98.8
87	86/87/97/108/119/125	34.972	1.56	(60200)	---	98.8
88	88/91	31.400	1.57	15500	---	49.4
89		32.138	1.52	1240	---	49.4
90	90/101/113	33.764	1.56	87300	---	49.4
91	88/91	31.400	1.57	(15500)	---	49.4
92		33.127	1.57	13600	---	49.4
93	93/98/100/102	30.830	1.59	4590	---	74.1
94		29.941	1.61	683	---	49.4
95		30.427	1.57	81100	---	49.4
96		27.425	1.64	1130	---	49.4

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
Nn = Value obtained from additional analyses

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

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 PRF0542-01 ; FO 080753
Lab Sample ID 1075272001
Filename P80722A_18

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	34.972	1.56	(60200)	---	98.8
98	93/98/100/102	30.830	1.59	(4590)	---	74.1
99		34.385	1.56	39900	---	49.4
100	93/98/100/102	30.830	1.59	(4590)	---	74.1
101	90/101/113	33.764	1.56	(87300)	---	49.4
102	93/98/100/102	30.830	1.59	(4590)	---	74.1
103		29.723	1.55	610	---	49.4
104		---	---	ND	---	49.4
105		40.372	1.54	44000	---	49.4
106		---	---	ND	---	49.4
107	107/124	38.426	1.61	3320	---	49.4
108	86/87/97/108/119/125	34.972	1.56	(60200)	---	98.8
109		38.695	1.54	4660	---	49.4
110	110/115	35.861	1.56	83500	---	49.4
111		---	---	ND	---	49.4
112		---	---	ND	---	49.4
113	90/101/113	33.764	1.56	(87300)	---	49.4
114		39.718	1.57	2710	---	49.4
115	110/115	35.861	1.56	(83500)	---	49.4
116	85/116/117	35.676	1.60	(11900)	---	59.3
117	85/116/117	35.676	1.60	(11900)	---	59.3
118		39.164	1.56	92600	---	49.4
119	86/87/97/108/119/125	34.972	1.56	(60200)	---	98.8
120		37.219	1.39	69.1	---	49.4
121		---	---	ND	---	49.4
122		39.500	1.55	1040	---	49.4
123		38.812	1.55	1900	---	49.4
124	107/124	38.426	1.61	(3320)	---	49.4
125	86/87/97/108/119/125	34.972	1.56	(60200)	---	98.8
126		43.709	1.55	1800	---	49.4
127		42.032	1.50	225	---	49.4
128	128/166	43.709	1.25	13700	---	98.8
129	129/138/163	42.434	1.24	85800	---	49.4
130		41.730	1.25	5460	---	49.4
131		38.695	1.31	1430	---	49.4
132		39.164	1.26	30800	---	49.4
133		39.818	1.10	1040	---	49.4
134	134/143	38.057	1.25	3860	---	49.4
135	135/151	36.884	1.29	24800	---	50.4
136		34.184	1.29	11200	---	49.4
137		41.965	1.26	4010	---	49.4
138	129/138/163	42.434	1.24	(85800)	---	49.4
139	139/140	38.510	1.23	1710	---	49.4
140	139/140	38.510	1.23	(1710)	---	49.4
141		41.327	1.25	14200	---	49.4
142		---	---	ND	---	49.4
143	134/143	38.057	1.25	(3860)	---	49.4
144		37.487	1.23	4690	---	49.4

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
Nn = Value obtained from additional analyses

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

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	PRF0542-01 ; FO 080753
Lab Sample ID	1075272001
Filename	P80722A_18

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		34.519	1.14	53.3	---	49.4
146		40.489	1.23	9950	---	49.4
147	147/149	37.856	1.25	61100	---	49.4
148		36.263	1.13	69.0	---	49.4
149	147/149	37.856	1.25	(61100)	---	49.4
150		33.832	1.43	155	---	49.4
151	135/151	36.884	1.29	(24800)	---	50.4
152		33.630	1.28	96.3	---	49.4
153	153/168	41.143	1.25	61000	---	59.3
154		37.169	1.28	710	---	49.4
155		---	---	ND	---	49.4
156	156/157	46.777	1.24	16300	---	49.4
157	156/157	46.777	1.24	(16300)	---	49.4
158		42.837	1.26	8290	---	49.4
159		---	---	ND	---	49.4
160		---	---	ND	---	49.4
161		---	---	ND	---	49.4
162		45.134	1.34	730	---	49.4
163	129/138/163	42.434	1.24	(85800)	---	49.4
164		42.082	1.26	5890	---	49.4
165		---	---	ND	---	49.4
166	128/166	43.709	1.25	(13700)	---	98.8
167		45.637	1.26	4320	---	49.4
168	153/168	41.143	1.25	(61000)	---	59.3
169		50.198	1.41	216	---	49.4
170		49.460	1.03	11600	---	49.4
171	171/173	45.788	1.02	4490	---	49.4
172		47.532	1.03	2220	---	49.4
173	171/173	45.788	1.02	(4490)	---	49.4
174		44.665	1.04	15000	---	49.4
175		43.541	0.89	735	---	49.4
176		40.891	1.03	2170	---	49.4
177		45.134	1.01	7120	---	49.4
178		42.887	1.05	3460	---	49.4
179		39.952	1.06	7360	---	49.4
180	180/193	48.203	1.04	29400	---	49.4
181		45.553	0.77 I	---	118	49.4
182		---	---	ND	---	49.4
183	183/185	44.480	1.03	12800	---	49.4
184		40.556	0.94	58.5	---	49.4
185	183/185	44.480	1.03	(12800)	---	49.4
186		---	---	ND	---	49.4
187		43.826	1.08	21900	---	49.4
188		39.634	1.18	70.2	---	49.4
189		52.725	1.15	849	---	49.4
190		50.031	0.99	1900	---	49.4
191		48.555	1.01	514	---	49.4
192		---	---	ND	---	49.4

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
Nn = Value obtained from additional analyses

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

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 PRF0542-01 ; FO 080753
Lab Sample ID 1075272001
Filename P80722A_18

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	48.203	1.04	(29400)	---	49.4
194		54.816	0.89	9340	---	49.4
195		52.380	0.87	2940	---	49.4
196		50.835	0.91	6240	---	69.2
197	197/200	47.213	0.88	2250	---	247
198	198/199	50.165	0.89	19000	---	49.4
199	198/199	50.165	0.89	(19000)	---	49.4
200	197/200	47.213	0.88	(2250)	---	247
201		46.207	0.91	2510	---	49.4
202		45.251	0.92	3880	---	49.4
203		51.053	0.90	11000	---	49.4
204		---	---	ND	---	49.4
205		55.290	0.88	514	---	49.4
206		57.014	0.77	19200	---	49.4
207		53.048	0.80	2220	---	49.4
208		52.100	0.77	5290	---	49.4
209		58.566	0.70	4890	---	49.4

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
Nn = Value obtained from additional analyses

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

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	PRF0542-01 ; FO 080753
Lab Sample ID	1075272001
Filename	P80722A_18

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	1100
Total Dichloro Biphenyls	59400
Total Trichloro Biphenyls	470000
Total Tetrachloro Biphenyls	657000
Total Pentachloro Biphenyls	593000
Total Hexachloro Biphenyls	372000
Total Heptachloro Biphenyls	122000
Total Octachloro Biphenyls	57700
Total Nonachloro Biphenyls	26700
Decachloro Biphenyls	4890
Total PCBs	2360000

ND = Not Detected
Results reported on a dry weight basis

REPORT OF LABORATORY ANALYSIS

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

Lab Sample ID	BLANK-16815		
Filename	P80708A_13		
Injected By	SMT	Matrix	Solid
Total Amount Extracted	10.2 g	Extracted	06/30/2008
ICAL ID	P80708A10	Analyzed	07/08/2008 23:11
CCal Filename(s)	P80708A_09	Dilution	NA

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	8.438	2.90	2.0	0.883	44
13C-4-MoCB	3	11.817	2.96	2.0	0.826	41
13C-2,2'-DiCB	4	12.189	1.58	2.0	1.01	50
13C-4,4'-DiCB	15	20.206	1.46	2.0	1.32	66
13C-2,2',6-TrCB	19	16.611	1.07	2.0	1.30	65
13C-3,4,4'-TrCB	37	28.543	1.01	2.0	1.69	85
13C-2,2',6,6'-TeCB	54	20.544	0.79	2.0	1.45	73
13C-3,4,4',5-TeCB	81	35.906	0.74	2.0	1.58	79
13C-3,3',4,4'-TeCB	77	36.510	0.76	2.0	1.57	78
13C-2,2',4,6,6'-PeCB	104	27.151	1.60	2.0	1.77	88
13C-2,3,3',4,4'-PeCB	105	40.166	1.53	2.0	1.59	79
13C-2,3,4,4',5-PeCB	114	39.512	1.52	2.0	1.37	68
13C-2,3',4,4',5-PeCB	118	38.959	1.51	2.0	1.60	80
13C-2,3',4,4',5'-PeCB	123	38.623	1.50	2.0	1.67	84
13C-3,3',4,4',5-PeCB	126	43.369	1.52	2.0	1.54	77
13C-2,2',4,4',6,6'-HxCB	155	33.474	1.27	2.0	1.92	96
13C-HxCB (156/157)	156/157	46.455	1.22	4.0	2.78	69
13C-2,3',4,4',5,5'-HxCB	167	45.298	1.20	2.0	1.42	71
13C-3,3',4,4',5,5'-HxCB	169	49.759	1.20	2.0	1.21	61
13C-2,2',3,4',5,6,6'-HpCB	188	39.512	1.07	2.0	2.90	145
13C-2,3,3',4,4',5,5'-HpCB	189	52.322	1.01	2.0	2.20	110
13C-2,2',3,3',5,5',6,6'-OcCB	202	45.030	0.92	2.0	2.76	138
13C-2,3,3',4,4',5,5',6-OcCB	205	54.909	0.88	2.0	2.14	107
13C-2,2',3,3',4,4',5,5',6-NoCB	206	56.655	0.79	2.0	2.17	109
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.826	0.81	2.0	2.21	111
13C--DeCB	209	58.272	0.71	2.0	2.25	113
Cleanup Standards						
13C-2,4,4'-TrCB	28	23.931	1.00	2.0	1.65	82
13C-2,3,3',5,5'-PeCB	111	36.594	1.59	2.0	1.76	88
13C-2,2',3,3',5,5',6-HpCB	178	42.665	1.06	2.0	1.65	82
Recovery Standards						
13C-2,5-DiCB	9	15.269	1.50	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.078	0.78	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.709	1.62	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	42.179	1.26	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	54.435	0.91	2.0	NA	NA

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
Nn = Value obtained from additional analyses

Results reported on a total 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

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

Lab Sample ID BLANK-16815
Filename P80708A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	49.1
2		---	---	ND	---	49.1
3		---	---	ND	---	49.1
4		---	---	ND	---	49.1
5		---	---	ND	---	49.1
6		---	---	ND	---	49.1
7		---	---	ND	---	49.1
8		---	---	ND	---	49.1
9		---	---	ND	---	49.1
10		---	---	ND	---	49.1
11		19.463	1.44	186	---	58.9
12	12/13	---	---	ND	---	49.1
13	12/13	---	---	ND	---	49.1
14		---	---	ND	---	49.1
15		---	---	ND	---	49.1
16		---	---	ND	---	49.1
17		---	---	ND	---	49.1
18	18/30	19.067	1.03	57.3	---	49.1
19		---	---	ND	---	49.1
20	20/28	23.965	0.94	78.7	---	58.9
21	21/33	---	---	ND	---	49.1
22		---	---	ND	---	49.1
23		---	---	ND	---	49.1
24		---	---	ND	---	49.1
25		---	---	ND	---	49.1
26	26/29	---	---	ND	---	49.1
27		---	---	ND	---	49.1
28	20/28	23.965	0.94	(78.7)	---	58.9
29	26/29	---	---	ND	---	49.1
30	18/30	19.067	1.03	(57.3)	---	49.1
31		---	---	ND	---	49.1
32		---	---	ND	---	49.1
33	21/33	---	---	ND	---	49.1
34		---	---	ND	---	49.1
35		---	---	ND	---	49.1
36		---	---	ND	---	49.1
37		---	---	ND	---	49.1
38		---	---	ND	---	49.1
39		---	---	ND	---	49.1
40	40/41/71	---	---	ND	---	49.1
41	40/41/71	---	---	ND	---	49.1
42		---	---	ND	---	49.1
43		---	---	ND	---	49.1
44	44/47/65	---	---	ND	---	58.9
45	45/51	---	---	ND	---	49.1

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

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

Results reported on a total weight basis

REPORT OF LABORATORY ANALYSIS

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

Lab Sample ID BLANK-16815
Filename P80708A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
46		---	---	ND	---	49.1
47	44/47/65	---	---	ND	---	58.9
48		---	---	ND	---	49.1
49	49/69	---	---	ND	---	49.1
50	50/53	---	---	ND	---	49.1
51	45/51	---	---	ND	---	49.1
52		---	---	ND	---	49.1
53	50/53	---	---	ND	---	49.1
54		---	---	ND	---	49.1
55		---	---	ND	---	49.1
56		---	---	ND	---	49.1
57		---	---	ND	---	49.1
58		---	---	ND	---	49.1
59	59/62/75	---	---	ND	---	49.1
60		---	---	ND	---	49.1
61	61/70/74/76	---	---	ND	---	49.1
62	59/62/75	---	---	ND	---	49.1
63		---	---	ND	---	49.1
64		---	---	ND	---	49.1
65	44/47/65	---	---	ND	---	58.9
66		---	---	ND	---	49.1
67		---	---	ND	---	49.1
68		---	---	ND	---	49.1
69	49/69	---	---	ND	---	49.1
70	61/70/74/76	---	---	ND	---	49.1
71	40/41/71	---	---	ND	---	49.1
72		---	---	ND	---	49.1
73		---	---	ND	---	49.1
74	61/70/74/76	---	---	ND	---	49.1
75	59/62/75	---	---	ND	---	49.1
76	61/70/74/76	---	---	ND	---	49.1
77		---	---	ND	---	49.1
78		---	---	ND	---	49.1
79		---	---	ND	---	49.1
80		---	---	ND	---	49.1
81		---	---	ND	---	49.1
82		---	---	ND	---	49.1
83		---	---	ND	---	49.1
84		---	---	ND	---	49.1
85	85/116/117	---	---	ND	---	58.9
86	86/87/97/108/119/125	---	---	ND	---	98.2
87	86/87/97/108/119/125	---	---	ND	---	98.2
88	88/91	---	---	ND	---	49.1
89		---	---	ND	---	49.1
90	90/101/113	---	---	ND	---	49.1

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

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

Results reported on a total weight basis

REPORT OF LABORATORY ANALYSIS

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

Lab Sample ID BLANK-16815
Filename P80708A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
91	88/91	---	---	ND	---	49.1
92		---	---	ND	---	49.1
93	93/98/100/102	---	---	ND	---	73.7
94		---	---	ND	---	49.1
95		---	---	ND	---	49.1
96		---	---	ND	---	49.1
97	86/87/97/108/119/125	---	---	ND	---	98.2
98	93/98/100/102	---	---	ND	---	73.7
99		---	---	ND	---	49.1
100	93/98/100/102	---	---	ND	---	73.7
101	90/101/113	---	---	ND	---	49.1
102	93/98/100/102	---	---	ND	---	73.7
103		---	---	ND	---	49.1
104		---	---	ND	---	49.1
105		---	---	ND	---	49.1
106		---	---	ND	---	49.1
107	107/124	---	---	ND	---	49.1
108	86/87/97/108/119/125	---	---	ND	---	98.2
109		---	---	ND	---	49.1
110	110/115	---	---	ND	---	49.1
111		---	---	ND	---	49.1
112		---	---	ND	---	49.1
113	90/101/113	---	---	ND	---	49.1
114		---	---	ND	---	49.1
115	110/115	---	---	ND	---	49.1
116	85/116/117	---	---	ND	---	58.9
117	85/116/117	---	---	ND	---	58.9
118		---	---	ND	---	49.1
119	86/87/97/108/119/125	---	---	ND	---	98.2
120		---	---	ND	---	49.1
121		---	---	ND	---	49.1
122		---	---	ND	---	49.1
123		---	---	ND	---	49.1
124	107/124	---	---	ND	---	49.1
125	86/87/97/108/119/125	---	---	ND	---	98.2
126		---	---	ND	---	49.1
127		---	---	ND	---	49.1
128	128/166	---	---	ND	---	98.2
129	129/138/163	---	---	ND	---	49.1
130		---	---	ND	---	49.1
131		---	---	ND	---	49.1
132		---	---	ND	---	49.1
133		---	---	ND	---	49.1
134	134/143	---	---	ND	---	49.1
135	135/151	---	---	ND	---	50.1

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

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

Results reported on a total weight basis

REPORT OF LABORATORY ANALYSIS

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

Lab Sample ID BLANK-16815
Filename P80708A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
136		---	---	ND	---	49.1
137		---	---	ND	---	49.1
138	129/138/163	---	---	ND	---	49.1
139	139/140	---	---	ND	---	49.1
140	139/140	---	---	ND	---	49.1
141		---	---	ND	---	49.1
142		---	---	ND	---	49.1
143	134/143	---	---	ND	---	49.1
144		---	---	ND	---	49.1
145		---	---	ND	---	49.1
146		---	---	ND	---	49.1
147	147/149	---	---	ND	---	49.1
148		---	---	ND	---	49.1
149	147/149	---	---	ND	---	49.1
150		---	---	ND	---	49.1
151	135/151	---	---	ND	---	50.1
152		---	---	ND	---	49.1
153	153/168	---	---	ND	---	58.9
154		---	---	ND	---	49.1
155		---	---	ND	---	49.1
156	156/157	---	---	ND	---	49.1
157	156/157	---	---	ND	---	49.1
158		---	---	ND	---	49.1
159		---	---	ND	---	49.1
160		---	---	ND	---	49.1
161		---	---	ND	---	49.1
162		---	---	ND	---	49.1
163	129/138/163	---	---	ND	---	49.1
164		---	---	ND	---	49.1
165		---	---	ND	---	49.1
166	128/166	---	---	ND	---	98.2
167		---	---	ND	---	49.1
168	153/168	---	---	ND	---	58.9
169		---	---	ND	---	49.1
170		---	---	ND	---	49.1
171	171/173	---	---	ND	---	49.1
172		---	---	ND	---	49.1
173	171/173	---	---	ND	---	49.1
174		---	---	ND	---	49.1
175		---	---	ND	---	49.1
176		---	---	ND	---	49.1
177		---	---	ND	---	49.1
178		---	---	ND	---	49.1
179		---	---	ND	---	49.1
180	180/193	---	---	ND	---	49.1

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

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

Results reported on a total weight basis

REPORT OF LABORATORY ANALYSIS

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

Lab Sample ID BLANK-16815
Filename P80708A_13

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
181		---	---	ND	---	49.1
182		---	---	ND	---	49.1
183	183/185	---	---	ND	---	49.1
184		---	---	ND	---	49.1
185	183/185	---	---	ND	---	49.1
186		---	---	ND	---	49.1
187		---	---	ND	---	49.1
188		---	---	ND	---	49.1
189		---	---	ND	---	49.1
190		---	---	ND	---	49.1
191		---	---	ND	---	49.1
192		---	---	ND	---	49.1
193	180/193	---	---	ND	---	49.1
194		---	---	ND	---	49.1
195		---	---	ND	---	49.1
196		---	---	ND	---	68.8
197	197/200	---	---	ND	---	246
198	198/199	---	---	ND	---	49.1
199	198/199	---	---	ND	---	49.1
200	197/200	---	---	ND	---	246
201		---	---	ND	---	49.1
202		---	---	ND	---	49.1
203		---	---	ND	---	49.1
204		---	---	ND	---	49.1
205		---	---	ND	---	49.1
206		---	---	ND	---	49.1
207		---	---	ND	---	49.1
208		---	---	ND	---	49.1
209		---	---	ND	---	49.1

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

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

Results reported on a total weight basis

REPORT OF LABORATORY ANALYSIS

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-16815
Filename P80708A_13

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	186
Total Trichloro Biphenyls	136
Total Tetrachloro Biphenyls	ND
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	322

ND = Not Detected
Results reported on a total weight basis

REPORT OF LABORATORY ANALYSIS

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

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

Method 1668A Polychlorobiphenyls
Laboratory Control Spike Analysis Results

Lab Sample ID	LCS-16816		
Filename	P80708A_11	Matrix	Solid
Total Amount Extracted	10.2 g	Dilution	NA
ICAL ID	P80708A10	Extracted	06/30/2008
CCal Filename(s)	P80708A_09	Analyzed	07/08/2008 21:06
Method Blank ID	BLANK-16815	Injected By	SMT

	Native Analytes			Labeled Analytes			
PCB Isomer	**Spiked (ng)**	**Found (ng)**	**% Recovery**	**Spiked (ng)**	**Found (ng)**	**% Recovery**	
1	1.0	1.06	106	2.0	1.21	60	
3	1.0	1.07	107	2.0	1.10	55	
4	1.0	1.16	116	2.0	1.31	65	
15	1.0	1.21	121	2.0	1.59	79	
19	1.0	1.14	114	2.0	1.63	81	
37	1.0	1.30	130	2.0	1.73	86	
54	1.0	1.08	108	2.0	1.66	83	
81	1.0	1.06	106	2.0	1.62	81	
77	1.0	1.09	109	2.0	1.56	78	
104	1.0	1.10	110	2.0	1.88	94	
105	1.0	1.11	111	2.0	1.70	85	
114	1.0	1.04	104	2.0	1.49	74	
118	1.0	1.14	114	2.0	1.73	86	
123	1.0	1.01	101	2.0	1.76	88	
126	1.0	1.01	101	2.0	1.59	80	
155	1.0	1.12	112	2.0	1.73	87	
156/157	2.0	2.09	104	4.0	2.51	63	
167	1.0	0.954	95	2.0	1.30	65	
169	1.0	1.13	113	2.0	1.05	53	
188	1.0	1.10	110	2.0	3.22	161	P
189	1.0	1.16	116	2.0	1.99	99	
202	1.0	1.14	114	2.0	2.76	138	
205	1.0	1.09	109	2.0	2.09	105	
206	1.0	1.11	111	2.0	2.05	103	
208	1.0	1.17	117	2.0	2.01	101	
209	1.0	1.11	111	2.0	2.13	106	

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210
ORELAP#: OR100021

July 30, 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 07/30/08 15:35.

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

Work Order	Project	ProjectNumber
PRF0542	Portland Harbor	36238

TestAmerica Portland

Howard Holmes, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

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:
07/30/08 15:35

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FO 080753	PRF0542-01	Other wet	06/02/08 15:28	06/13/08 14:32

TestAmerica Portland

Howard Holmes, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

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:
07/30/08 15:35

Total Organic Carbon

TestAmerica Connecticut

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PRF0542-01 (FO 080753)			**Other wet**			**Sampled: 06/02/08 15:28**				
Total Organic Carbon - Duplicates	9060	**159000**	-----	100	mg/Kg	1x	17307	06/24/08 21:54	06/24/08 21:54	

TestAmerica Portland

Howard Holmes, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

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:
07/30/08 15:35

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

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

PORTLAND, OR 9405 S.W. NIMBUS AVENUE
BEAVERTON, OR 97008-7132
ph: (503) 906.9200 fax: (503) 906.9210

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:
07/30/08 15:35

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

TestAmerica
ANALYTICAL TESTING CORPORATION

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244	425-420-9200	FAX 420-9210	☐
11922 E. First Ave, Spokane, WA 99206-5302	509-924-9200	FAX 924-9290	☐
9405 SW Nimbus Ave, Beaverton, OR 97008-7145	503-906-9200	FAX 906-9210	☒
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119	907-563-9200	FAX 563-9210	☐

CHAIN OF CUSTODY REPORT

Work Order #: PRF0542

CLIENT: City of Portland

REPORT TO: / ADDRESS: Jennifer Shackelford

PHONE: FAX:

INVOICE TO: Charles Lytle

P.O. NUMBER: 36238

PROJECT NAME: Portland Harbor

PROJECT NUMBER: Stormwater Samp - OF19 Sed. Trap

SAMPLED BY:

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: [X] 10 (STD) ☐ 7 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ <1

Petroleum Hydrocarbon Analyses: ☐ 5 (STD) ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges

PRESERVATIVE

REQUESTED ANALYSES: TOC; (*) PCB 209 Congeners

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	TOC	(*) PCB 209 Congeners		MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	TA WO ID
1 FO080753	6/2/08 1528	X	X	TS (w/w) = 46.2%	O	2	(*)(*)	
2								
3								
4								
5								
6								
7								
8								
9								
10								

RELEASED BY: [signature]		DATE: 6/13/08	RECEIVED BY: [signature]	DATE: 6/13/08
PRINT NAME: Rona Kluch	FIRM: City of Portland	TIME: 13:00	PRINT NAME: Bob F	FIRM: TAP	TIME: 13:00
RELEASED BY: [signature]		DATE: 6/13/08	RECEIVED BY: [signature]	DATE: 6/13
PRINT NAME: Bob F	FIRM: TAP	TIME: 14:32	PRINT NAME: Brianna Farley	FIRM: TAP	TIME: 1432

ADDITIONAL REMARKS: (*) PCB 209 Congeners to Pace Analytical

TEMP: 6.0°C PAGE 1 OF 1

TAL-1000 0907

(*)(*) Total solids (w/w) = 46.2%
(determined @ WPCL due to limited sample size - use this value in calculations).

TestAmerica Sample Receipt Checklist

Received by: (section A)
Date: 6/13/08
Time: 1432
Initials: BLE

Unpacked by: (section B)
Date: 6/13/08
Initials: BLE

Logged-in by:
Date: 6/13/08
Initials: JI

Work Order No. PRF0542
Client: City of Portland
Project: Portland Harbor

Temperature out of range
___ Not enough Ice
___ No Ice
___ Ice Melted
___ Wtn 4 Hours
___ Other

***ESI Clients (see Section C)

Cooler Temperature (IR): 4.0 °C plastic ~~glass~~ NA (oil/air OR ESI client) Temperature Blank: _____ °C DIGI #1 #2

A

Custody Seals: (#___)

Signature: Y N Dated:_____
X None

Container Type:
1 #Cooler(s)
___ #Box(s)
___ None (___ #Other:_____)

Coolant Type:
___ Gel/ Blue Ice
X Loose Ice
___ None

Packing Material:
___ Bubble Bags
___ Styrofoam Cubbies
___ Peanuts
X None (___ Other:_____)

Received from:
X 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)	N	
# Containers Match COC?	(Y)	N	none given
IDs Match COC?	(Y)	N	
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)

C

***ESI Clients Only:

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.)*

FED EX/ UPS: Was the tracking paper keepable? YES NO

If circled NO, what is the Tracking number? _____

FED EX Goldstreak UPS DHL Other: _____

Project Managers:

Comments: _____

PM Reviewed: _____ *(Initial/Date)*