CITY OF PORTLAND
ENVIRONMENTAL SERVICES
1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204-1912 ▪ Sam Adams, Commissioner ▪ Dean Marriott, Director

TECHNICAL MEMORANDUM No. OF22B-1

City Outfall Basin 22B
Upland Source Control Investigation

TO: Chip Humphrey, EPA

FROM: Dawn Sanders, City of Portland, BES
Linda Scheffler, City of Portland, BES

COPIES: Kristine Koch, EPA
Tom Roick, DEQ, Northwest Region Cleanup & Portland Harbor Section
Rod Struck, DEQ, Northwest Region Cleanup & Portland Harbor Section
Bruce Brody-Heine, GSI

DATE: November 17, 2005

SUBJECT: **Dry-Weather Flow Sampling of the Gould, Inc./NL Industries Stormwater Lateral Line**

Introduction

This technical memorandum summarizes the results of the City of Portland (City) Bureau of Environmental Services' (BES) source control investigation of dry-weather flow entering the Outfall Basin 22B stormwater conveyance system. A 2004 camera survey of the City line revealed an undocumented stormwater lateral line originating from the Gould, Inc./NL Industries (Gould) Superfund site. The City is concerned that this flow could be conveying contaminants from upland environmental cleanup sites into the City's stormwater collection system. This investigation, conducted in June 2005, is part of the City's ongoing source control program associated with the Portland Harbor City of Portland Outfalls Project. These investigation results are submitted pursuant to the August 13, 2003, Intergovernmental Agreement (IGA) between the Oregon Department of Environmental Quality (DEQ) and the City.

Purpose and Objectives

The purpose of this investigation is to evaluate whether dry-weather flow from the Gould lateral line could be contributing contaminants to the Willamette River via the City's conveyance system. Contaminants of Interest (COIs) at the Gould site include pesticides, herbicides, dioxins/furans, semivolatile organic compounds (SVOCs), and volatile organic compounds (VOCs) (AMEC, 2000 and 2003). According to the DEQ Environmental Cleanup Site Information Database (ECSI) Site Summary Report for Gould (ECSI Site

No. 49), contaminants originating at the Rhone Poulenc AG Company (RPAC) DEQ cleanup site have extended to the Gould site soils and groundwater (DEQ, 2003). Sediment samples collected in the Willamette River near Outfall 22B have also contained a similar suite of contaminants (Integral, 2005). As part of our ongoing source control program, the City sampled dry-weather flow from the Gould lateral line and analyzed it for the COIs identified at the upgradient Superfund and DEQ Cleanup sites and in river sediment data near Outfall 22B.

Background

Figure 1 shows the locations of the City Outfall Basin 22B stormwater conveyance system and the Gould lateral line. The City conveyance system at this location consists of a 48-inch-diameter concrete pipe in NW Front Ave., and affiliated catch basins. Metro Rooter Plumbing (MRP) conducted a camera survey of this storm line for AMEC Earth & Environmental (AMEC) in June 2004 (MRP, 2004) as part of an investigation of potential impacts to the City stormwater conveyance system associated with the RPAC groundwater plume (ECSI Site No.155). During the survey, MRP staff observed an 18-inch concrete stormwater lateral entering the west side of the 48-inch City line approximately 65 feet southeast and upstream of manhole AAJ653.

As part of the remedial actions on the Gould site, an Onsite Containment Facility (OCF) was constructed to restrict the migration of contaminants off site. The Gould OCF design included a stormwater collection and piping system. While the City does not have a connection permit on record for this Gould stormwater line, the U.S. Environmental Protection Agency's (EPA) project manager has indicated that the location corresponds to the private line associated with the OCF stormwater collection system (EPA, 2005). According to EPA, the connection of the Gould site stormwater collection system to the City's conveyance system was completed by August 2000.

The MRP survey documented water flowing from the Gould line after an extended dry period of more than 72 hours. The Gould site system is designed to collect and convey stormwater only from the OCF (EPA, 2005). Water flowing from the line during dry-weather periods could represent latent release of captured stormwater, undocumented process discharge, or groundwater infiltration.

Field Activities

The City coordinated with DEQ regarding this source control investigation prior to conducting this work. Flow from the Gould site stormwater lateral was sampled by the BES Field Operations section between approximately 9:00 and 9:45 am on June 21, 2005.

Collection of a dry-weather flow sample requires minimal precipitation in the 24-hour period preceding sample collection (optimally < 0.1 inch of rainfall) to ensure no stormwater is moving through the conveyance system. No measurable precipitation occurred at the Gould site on the day of sampling (June 21, 2005). Approximately 0.01 inch of precipitation was recorded on June 20 at a nearby rain gauge; 0.04 inch fell on

June 19 at this gauge location. Based upon the rainfall information, this sample represents dry-weather flow.

Samples were collected by filling a beaker with water discharging from the Gould line and then decanting the water into sample bottles, in accordance with BES Field Operations Standard Operating Procedures. The sample was clear and had no obvious color or odor. Flow from the Gould line, at the time of sample collection, was estimated to be approximately 0.5 gallon per minute (gpm). Photos of the lateral line are included in Attachment A. Field notes taken during sampling are provided in Attachment B.

Summary of Results

The dry-weather flow sample obtained from the Gould stormwater lateral was analyzed for total metals, chlorinated herbicides, dioxins and furans, pesticides, SVOCs, and VOCs. Nine metals, fifteen chlorinated pesticide compounds, one SVOC compound, and one VOC compound were detected in the sample at concentrations greater than the reporting limit. Individual dioxin/furan compounds and chlorinated herbicide compounds were not detected. Table 1 and Figures 1 and 2 summarize the analytes that were detected in the dry-weather flow sample. The laboratory analytical reports are provided in Attachment C. The results are further summarized below by analyte class.

- Of the nine metal constituents detected, the detected concentrations of arsenic and cadmium were greater than the most stringent Portland Harbor Joint Source Control Strategy (JSCS) (DEQ/EPA, 2005) screening levels.
- Concentrations of seven chlorinated pesticides exceeded the most stringent JSCS screening levels. Four chlorinated pesticides were detected at concentrations below the method reporting limit and were reported as estimated concentrations.
- One SVOC, 4-Chloro-3-methylphenol, was detected; a JSCS screening value has not been established for 4-Chloro-3-methylphenol.
- One VOC, 1,2-Dichlorobenzene, was detected; the concentration of 1,2-Dichlorobenzene was less than the most stringent JSCS screening value.

Conclusions and Recommendations

Analytical results for the dry-weather flow sample collected from the Gould stormwater lateral indicate that contaminants are being discharged to the City stormwater conveyance in NW Front Avenue. Detected contaminants are consistent with the COIs observed at both the Gould Superfund site and RPAC Cleanup site.

The City requests that EPA conduct further upland site investigation to ascertain the source and migration pathway of the Gould stormwater lateral contaminants, and to identify appropriate control mechanisms to address this source.

References

AMEC. 2000. Spreadsheet of the 2000 Rhone Poulenc Groundwater Concentration Data supplied by the Oregon Department of Environmental Quality.

AMEC. 2003. *Final Groundwater Characterization Report, RPAC - Portland Site,* prepared by AMEC Earth & Environmental, Inc., submitted to Oregon Department of Environmental Quality, March 28, 2003.

AMEC. 2004. *Spring 2004 Post-Characterization Groundwater Technical Memorandum*, prepared by AMEC Earth & Environmental, Inc., submitted to Oregon Department of Environmental Quality, November 1, 2004.

AMEC. 2005. *Draft Outfall 22B Storm Sewer Sampling Report, RP Portland Site,* prepared by AMEC Earth & Environmental, Inc., submitted to Oregon Department of Environmental Quality, March 24, 2005.

DEQ. 2003. DEQ Site Summary Report – Details for ECSI Site No. 49. DEQ Environmental Cleanup Site Information Database (ECSI). Accessed October 27, 2005.

DEQ/EPA. 2005. Portland Harbor Joint Source Control Strategy, Interim Final, dated September 2005.

EPA. 2005. Personal communication between Walter Burt, GSI, and Chip Humphrey, EPA, on October 13, 2005.

GSI. 2005. Review of AMEC Outfall 22 Storm Sewer Sampling Report (3/24/05), Rhone Poulenc Site. Technical memorandum prepared for the City of Portland Bureau of Environmental Services.

Integral. 2005. Portland Harbor RI/FS, Round 2A Sediment Site Characterization Report. Prepared for the Lower Willamette Group.

MRP Services. 2004. *Site Data for AMEC Environmental Project*, prepared by MRP Services for AMEC Environmental, June 24, 2004.

Table

Table 1 – *Summary of Detected Constituents, Dry-Weather Flow Water Sample*

Figures

Figure 1 - *Outfall Basin 22B Dry-Weather Flow Sampling – Pesticides, SVOC & VOC Compounds*

Figure 2 - *Outfall Basin 22B Dry-Weather Flow Sampling – Total Metals*

Attachments

Attachment A – *Field Photographs*

Attachment B - *Field Notes*

Attachment C - *Laboratory Results*

Table 1
Summary of Detected Constituents
Dry-Weather Flow Water Sample
Gould Stormwater Lateral - City Outfall Basin 22B

Class	Analyte	Units	Lateral Water IL-22B-AAJ653-0605 6/21/2005		JSCS Screening Level (Most Stringent)
Total Metals (EPA 200.8)					
	Antimony	µg/L	0.58		6 [3a]
	Arsenic	µg/L	10.7		0.014 [1b, 2b]
	Cadmium	µg/L	0.19		0.094 [1c]
	Copper	µg/L	0.66		2.9 [1c]
	Lead	µg/L	0.13		0.54 [1c]
	Molybdenum	µg/L	110		
	Nickel	µg/L	1.06		16 [1c]
	Vanadium	µg/L	2.52		
	Zinc	µg/L	0.51		32.7 [2c]
Herbicides - Chlorinated (EPA 8151)					
	None Detected				
PCDD/PCDF (Dioxins and Furans) (EPA 1613B)					
	None Detected				
Pesticides (EPA 8081 MOD)					
	2,4'-DDD	ng/L	0.80		0.31 [1b, 2b]
	2,4'-DDT	ng/L	0.02	J	0.22 [1b, 2b]
	4,4'-DDD	ng/L	1.22		0.31 [1b, 2b]
	4,4'-DDE	ng/L	0.14		0.22 [1b, 2b]
	4,4'-DDT	ng/L	0.02	J	0.22 [1b, 2b]
	Aldrin	ng/L	0.27		0.05 [1b, 2b]
	Alpha-BHC	ng/L	0.07		4.9 [1b, 2b]
	Alpha-Chlordane	ng/L	0.22		0.81 [1b, 2b]
	Dieldrin	ng/L	1.81		0.054 [1b, 2b]
	Endosulfan I	ng/L	0.29		56 [4]
	Endrin	ng/L	1.35		6 [1b, 2b]
	Endrin Ketone	ng/L	0.06	J	
	Gamma-Chlordane	ng/L	0.64		0.081 [1b, 2b]
	Heptachlor	ng/L	0.09	J	0.0079 [1b, 2b]
	Heptachlor Epoxide	ng/L	0.29		0.0039 [1b, 2b]
SemiVolatile Organics (EPA 8270)					
	1,2-Dichlorobenzene	µg/L	1.25		14 [4]
	4-Chloro-3-methylphenol	µg/L	5.97		
Volatile Organic Compounds (EPA 8260)					
	1,2-Dichlorobenzene	µg/L	2.15		14 [4]

Notes:

J = The analyte was detected at concentrations below the MRL but above the MDL and is considered is an estimated quantity.

µg/L = Micrograms per Liter; ng/L = Nanograms per Liter

JSCS - Portland Harbor Joint Source Control Strategy (DEQ/EPA Interim Final September 2005)

[1b] EPA's 2004 NRWQC Screening Level for Water - Fish Consumption: 175 g/day consumption rate (organism only).

[1c] EPA's 2004 NRWQC Screening Level for Water - Ecological Receptors (Chronic)

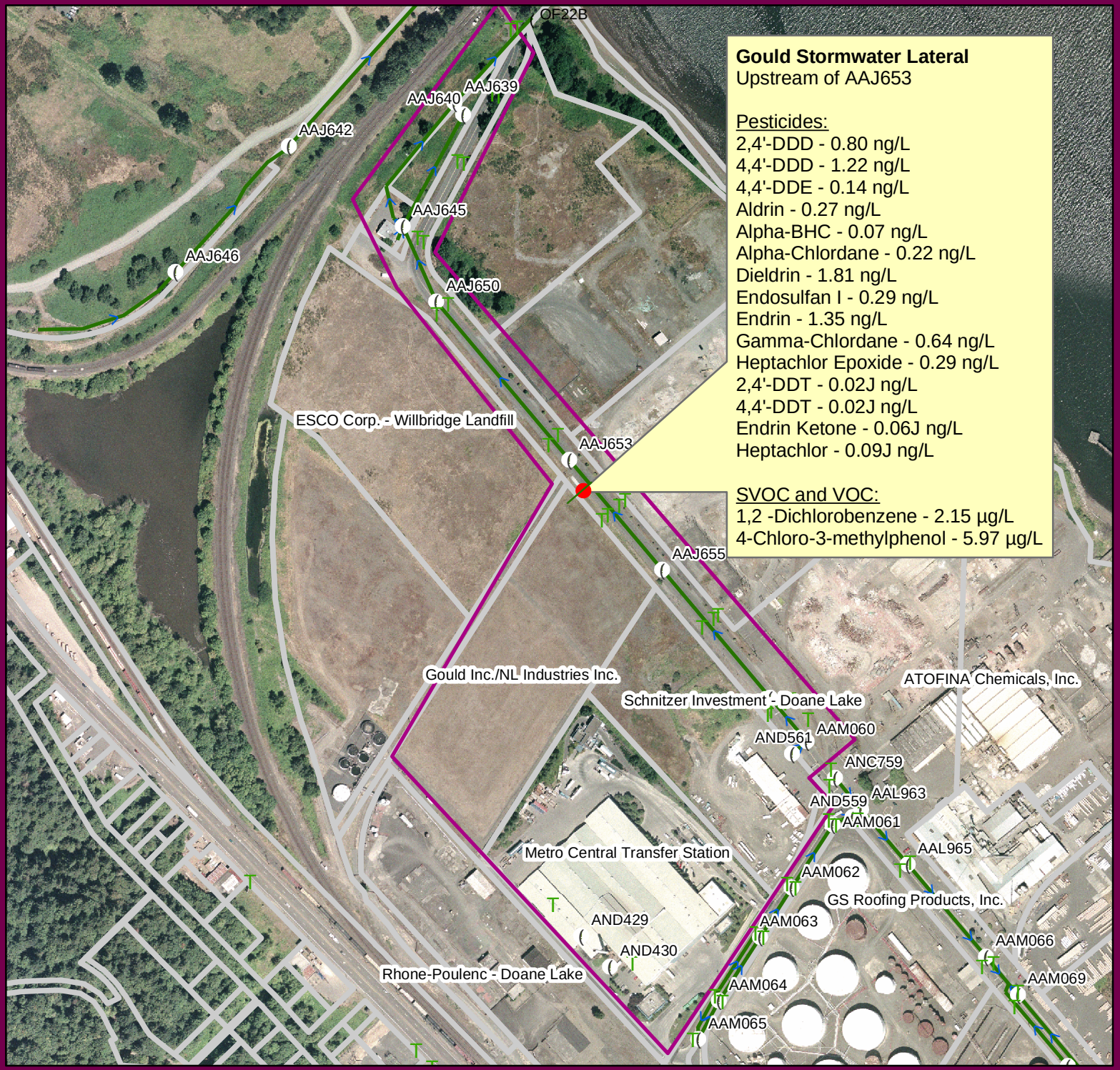
[2b] DEQ's 2004 AWQC Screening Level for Water - Fish Consumption: 175 g/day consumption rate (organism only).

[2c] DEQ's 2004 AWQC Screening Level for Water - Ecological Receptors (Chronic)

[3a] Screening Level for Drinking Water - MCL

[4] Oak Ridge National Laboratory's (Tier II SCV) Screening Level for Water - Ecological Receptors

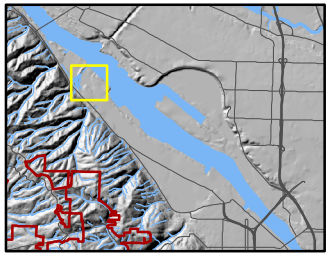
See Attachment C for complete list of analytical results and laboratory sheets



Gould Stormwater Lateral
Upstream of AAJ653

Pesticides:
2,4'-DDD - 0.80 ng/L
4,4'-DDD - 1.22 ng/L
4,4'-DDE - 0.14 ng/L
Aldrin - 0.27 ng/L
Alpha-BHC - 0.07 ng/L
Alpha-Chlordane - 0.22 ng/L
Dieldrin - 1.81 ng/L
Endosulfan I - 0.29 ng/L
Endrin - 1.35 ng/L
Gamma-Chlordane - 0.64 ng/L
Heptachlor Epoxide - 0.29 ng/L
2,4'-DDT - 0.02J ng/L
4,4'-DDT - 0.02J ng/L
Endrin Ketone - 0.06J ng/L
Heptachlor - 0.09J ng/L

SVOC and VOC:
1,2 -Dichlorobenzene - 2.15 µg/L
4-Chloro-3-methylphenol - 5.97 µg/L



Legend

- Storm Inlets
- Storm Pipe
- Manhole
- Taxlots
- 22B Basin Boundary
- Sample Location

0 250 500 1000 Feet

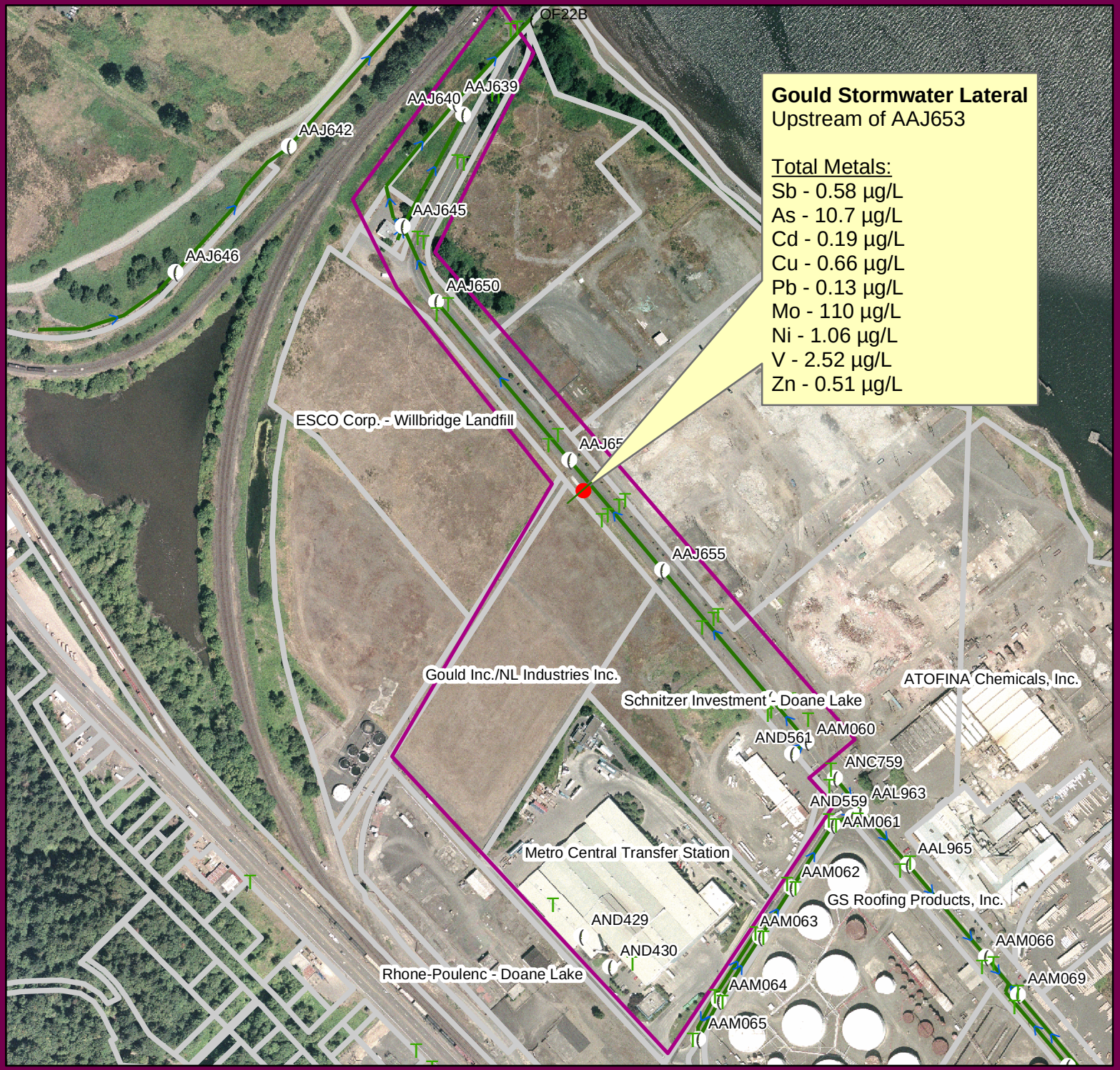
Note: Only detected constituents are shown.

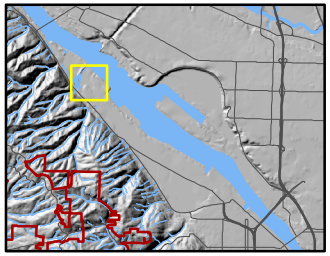
µg/L = micrograms/Liter
ng/L = nanograms/Liter

DEQ Environmental Cleanup Sites (ECSI) sites shown on map

Figure: 1
Outfall 22B Dry-Weather Flow Sampling
Pesticide, SVOC and VOC Compounds
Sample Date: 6/21/05

Source: City of Portland BES Aerial photo 2004	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\outfalls\outfalls_22b\of22b_gould.mxd	**Program Manager:** Dawn Sanders Portland Harbor Superfund
Sheet No. 1 OF 1	**Date Printed:** 10/28/05 **Prepared by:** Sara Gardner





Legend

- Storm Inlets
- Storm Pipe
- Manhole
- Taxlots
- 22B Basin Boundary
- Sample Location

0 250 500 1000 Feet

Note: Only detected constituents are shown.

µg/L = micrograms/Liter
ng/L = nanograms/Liter

DEQ Environmental Cleanup Sites (ECSI) sites shown on map

Figure: 2
Outfall 22B Dry-Weather Flow Sampling
Total Metals
Sample Date: 6/21/05

Source: City of Portland BES Aerial photo 2004	Environmental Services City of Portland 1120 SW Fifth Avenue, Room 1000 Portland Oregon, 97204-1912
File Name: s:\gis\outfalls\outfalls_22b\of22b_gouldmetals.mxd	Program Manager: Dawn Sanders Portland Harbor Superfund
Sheet No. 1 OF 1	Date Printed: 10/17/05 Prepared by: Sara Gardner

Attachment A
Field Photographs

Photo 1 (2005). The Gould stormwater lateral on June 21, 2005. The lateral is located 65 feet up-pipe from manhole AAJ653 on NW Front Avenue. Note that the field crew estimated the flow to be 0.5 gpm.

Photo 2 (2005). Location of the June 21, 2005 dry-weather flow sample from the Gould stormwater lateral.

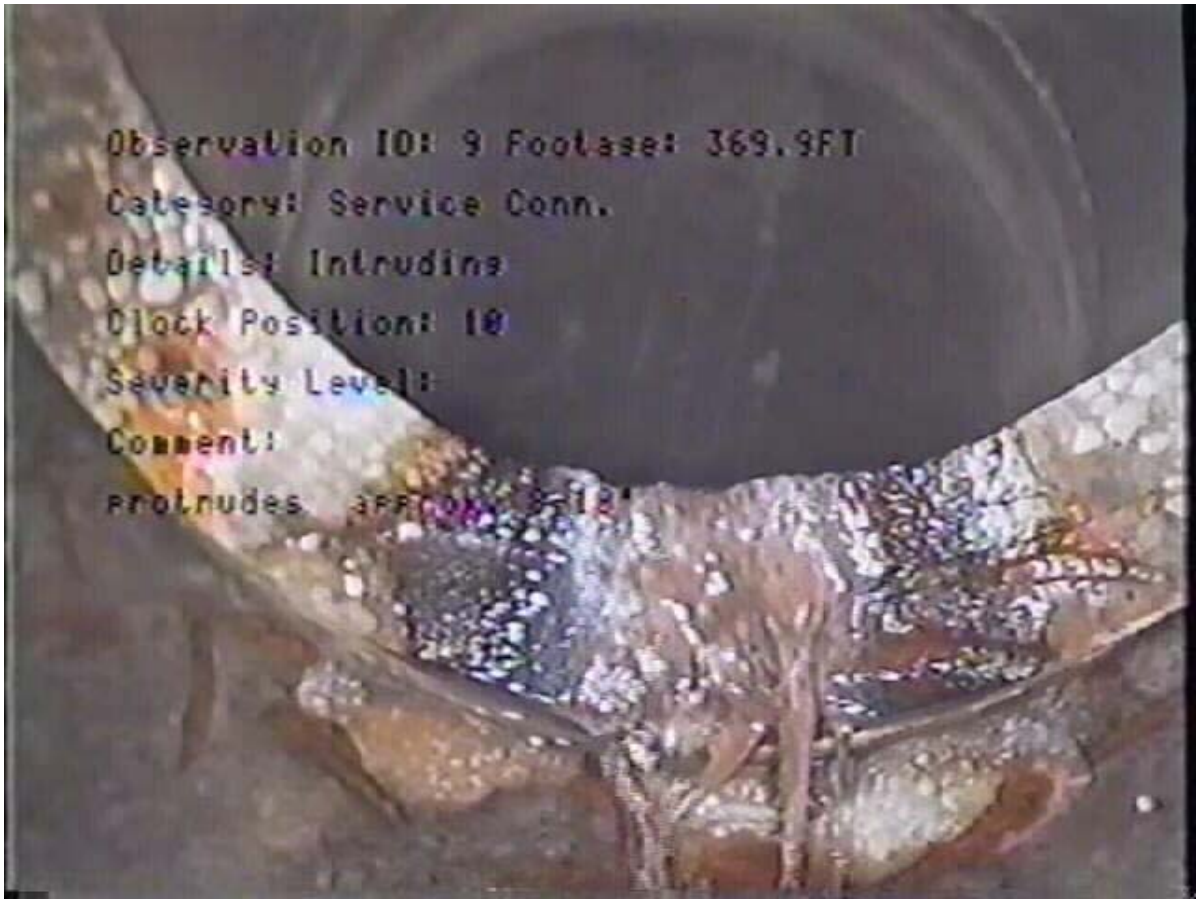


Photo 3 (2004). The Gould stormwater lateral with a slightly higher flow during the June 2004 camera survey of this line.

Attachment B
Field Notes

City of Portland
Environmental Services

DAILY FIELD REPORT

Project INLINE SEDIMENT SAMPLING
Project No. 7020.001
Location NW FRONT AVE
Date 6-21-05
Subject FIELD NOTES
By MJH

7:30 PREPARE EQUIPMENT FOR TODAYS SAMPLING EVENT, STAINLESS STEEL SPOONS + BUCKETS. DECONNED PER SOP 3.01a BY MJS.
ASSEMBLE SAMPLE BOTTLES, COC's, PAPERWORK. TODAYS WORK WILL INCLUDE 1 WATER SAMPLE + MULTIPLE SED SAMPLE.

8:30 DJH NOTIFIES L. SCHEFFLER THAT WE ARE PROCEEDING TO FIRST SAMPLE SITE.

9:00 ARRIVE AT 5909 NW 61ST (AAJ653). SET UP TRAFFIC CONTROL. MH is IN MIDDLE OF ROAD.

9:10 DJH ENTERS MH TO INSPECT SAMPLING LOCATION.

9:15 REPORTS PRESENCE OF 0.5 GPM COMING FROM LATERAL 65' UP FROM MH AAJ653.

0920 DJH BEGINS TO COLLECT SAMPLE FROM ABOVE LOCATION USING S.S. BEAKER.

0945 RELINQUISH WATER SAMPLE TO PETE. FOR PETE TO DELIVER TO THE LAB.

0951 MOVE TO AMW708. THIS IS A CATCH BASIN ABOUT 20' TO THE NORTH OF THE ROAD.

1000 COLLECTING SEDIMENT FROM CATCH BASIN.

1012 MOVE TO AND 879. WATER IN CATCH BASIN.

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project INLINE SEDIMENT SAMPLING
Location NW BAY
Subject FIELD NOTES

Project No. 1020.001
Date 6-21-05
By MJH

1020 SAMPLE COLLECTED FROM CATCH BASIN. WATER IN C.B. SANDY SEDIMENTS IN C.B. SANDY SEDS OBSERVED IN AREA AROUND CB.

1031 MOVE TO AND 878. THIS IS ANOTHER CB NORTH OF S/B OF FRONT AVE ~~MARINE DR~~. NO S OF SOME TRAIN TRACKS. GENTLEMAN WALKS UP TO US AND TALKS W/ LINDA. LARRY?

1038 SAMPLE COLLECTED FROM CATCH BASIN. LOTS OF CRAWER

1121 ARRIVE AT SWAN ISLAND. START AT AAQ004 BECAUSE IT WAS AN ALTERNATE. DSP ENTER MH. RIVER BACKED UP. NO SEDIMENTS IN ANY OF THE LINES AT THIS LOCATION.

1147 MOVE TO MH AAQ003. DSP ENTERS. WATER 5' DEEP AT THIS LOCATION. NO SEDS IN THE BOTTOM.

1155 AAQ118 - COULD NOT GET MH OPEN - DESPITE BEST EFFORTS

1210 AAQ005 - NOT FLOODED. THERE IS MINOR FLOW AT THIS LOCATION. DID NOT ENTER

Attachments

City of Portland
Environmental Services

DAILY FIELD REPORT

Project IN LINE SED SAMP
Project No. 1020.001
Location
Date 6-21-05
Subject FIELD NOTES
By MJJ

1210 BASIN M3 - DUE TO LACK OF SUCCESS WE ARE SUSPENDING OPS HERE TODAY.. WILL RETURN LATER IN THE SUMMER WHEN RIVER LEVELS ARE LOWER AND TRY AGAIN

1220 PETE ENTERS AACR003. MINOR FLOW. NO SEDIMENTS 48" DIA LINE

1230 LUNCH

1:30 ARRIVE AT OREGON STEEL MILLS - NODE AM 111 STANDING WATER IN THE LINE. SEDIMENT ALSO PRESENT. SEDIMENT IS A CEMENTED FINE SEDS.

1425 SAMPLES RETURNED TO OPEL + SUBMITTED TO LAB UNDER CHAIN OF CUSTODY. SAMPLES HAVE BEEN IN CHILLED COOLER ALL DAY

Attachments

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
Water Pollution Control Laboratory
6543 N. Burlington Ave.,
Portland, OR 97203-5452

106/1000

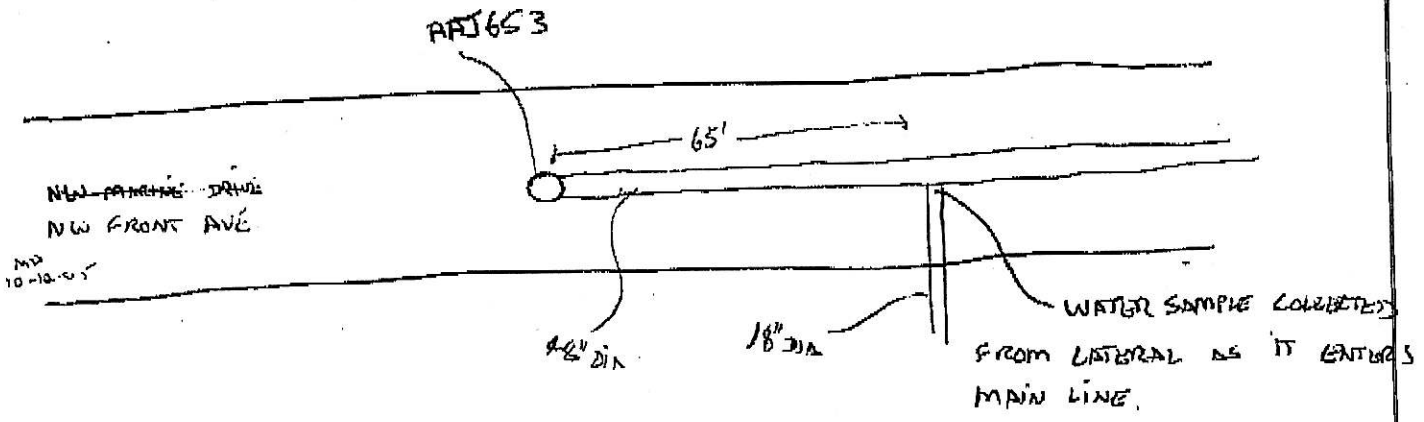
PORTLAND HARBOUR INLINE SEDIMENT SAMPLING - 1020.001
FIELD DATA SHEET

ate: 6-21-05	Time: 0900	Current Weather conditions: LIGHT CLOUDS 60's
ampling Team Present: DJH/PHA/MJH		
asin: 22B	Node: AAJ653	Subbasin:
ddress: 5909 NW 61st AVE		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

)escribe any flowing or standing water bserved in the line? 0.5	DOES 6PM COMMING OUT OF LATERAL INTO MAIN LINE CLEAR WATER.
)oes river appear to back up to this location?)escribe rate/color/odor of flow:	NO
\re sediments observed in the line?	NO
s there enough sediment in the line to collect a ;ample?	N/A
)escribe lateral extent and depth of sample-able sediments present in the line:	N/A

SITE DIAGRAM: Include street intersections/laterals/MH's/driveways cuts and extent of solids accumulation



SECTION 2 - SAMPLE COLLECTION REPORT

Node: AAJ 653

Sampling Equipment:	SS. BEAKER
Equipment Decontamination process:	Per FOps SOP 70.1a (circled) Other (Describe)
Sample date: 6-21-05	Sample time: 0928
Sample Identification: (IL-XX-NNNNNN-mmyy)	IL-22B-AAJ653-0605
Sample location: (number of feet from node of entry)	SAMPLE COLLECTED FROM LATERAL EMPTYING INTO MAIN LINE 65' UP FROM NODE AAJ653
Sample collection technique:	BEAKER FILLED W/ SAMPLE, THEN DECANTING INTO BOTTLES
Color of sample:	
Texture/Particle size:	N/A
Visual or olfactory evidence of contamination:	NO OBVIOUS ODORS. CLEAR
Depth of solids in area where sample collected:	—
Amount and type of debris:	N/A
Compositing notes:	N/A

Sample Jars Collected

If not enough sample to fill all of the jars, then fill jars in this order:				
	Metals			
	PAHs/SVOCs			
	PCBs			
	TPH (two jars)			
	TOC			

Duplicate sample collected?	NO
Duplicate sample fictitious identification # on COC:	—
Samples placed in chilled cooler? (Y)N	
Samples delivered to lab? (Y)N	Lab ID Number: FO 050657
Describe any deviations from standard procedures:	—

SECTION 3 - PHOTOGRAPH LOG

Photograph Log	In-Pipe sample location	
	Homogenized sample	

Attachment C
Laboratory Results

Groundwater Solutions, Inc.
55 SW Yamhill Street, Suite 400 Portland, Oregon 97204
ph: 503.239.8799 fx: 503.239.8940 e: groundwatersolutions.com

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

To: File

From: Bruce Brody-Heine, RG - GSI

Date: October 25, 2005

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated during source control investigation sampling and analyses recently conducted by the City of Portland (City) in Outfall Basin 22B. The results of the sampling and analysis are presented in the November 2005, Technical Memorandum No. OF 22B-1.

The laboratory analysis for these Source Control program samples were completed by the City's BES laboratory and subcontracted laboratories. The following list the analyses conducted by each laboratory.

- BES Laboratory - Volatile Organic Compounds (EPA Method 8260)
  Semivolatile Organic Compounds (EPA Method 8260)
  Total Metals (EPA Method 200.8)
- North Creek Analytical - Hexavalent Chromium (EPA Method 7195)
  Chlorinated Herbicides (EPA Method 8151A)
- Pace Analytical Services, Inc. - PCDDs/PCDFs (EPA Method 1613B)
- GERG - Pesticides (EPA Method 8081 Modified)

Attachment C of the Technical Memorandum No. OF 22B-1 presents the BES laboratory LIMS summary report for all analyses associated with this Outfall Basin investigation and the subcontracted laboratory's data reports. Subcontracted laboratories frequently receive batches of samples related to several BES sampling projects. In these cases, only those analytical results (and QA/QC pages) pertinent to this Outfall Basin investigation memorandum are provided with the subcontractor's reports to minimize confusion.

This QA/QC review is based upon the available documentation supplied with each laboratory package. The QA/QC review of the analytical data consisted of reviewing the following for each laboratory report:

- Chain-of-custody complete and correct
- Analysis within holding times
- Chemicals of interest in method blanks
- Surrogate recoveries within accuracy control limits

- Laboratory blank spike recoveries within accuracy control limits
- Laboratory blank spike duplicate results within analytical precision control limits
- Matrix spike recoveries within accuracy control limits
- Matrix spike duplicate results within analytical precision 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 the sample integrity maintained through the sample collection and delivery process.

Analysis Holding Times

Volatile Organic Analyses
All samples were extracted and analyzed within the required holding times.

Semi-Volatile Organic Analyses
All samples were extracted and analyzed within the required holding times.

Total Metal Analyses
All samples were extracted and analyzed within the required holding times.

Chlorinated Herbicides Analyses
All samples were extracted and analyzed within the required holding times.

Dioxins/Furan Analyses
All samples were extracted and analyzed within the required holding times.

Pesticides Analyses
All samples were extracted and analyzed within the required holding times.

Method Blanks

No chemicals were detected in the method blanks.

Surrogate Recoveries

All surrogate recoveries were within laboratory control limits.

Laboratory Duplicates

Laboratory duplicate analysis was completed during the laboratory analysis of hexavalent chromium and herbicides. Both the sample and the laboratory duplicate were non-detect; accordingly, relative percent differences (RPDs) could not be calculated.

Laboratory Control Sample Recoveries

Laboratory control samples were processed during the laboratory analyses of dioxins and furans (PCDD/PCDF), pesticides, herbicides, and hexavalent chromium. All laboratory control spike

recoveries were within laboratory control limits with the exception of the herbicide analysis. North Creek Analytical noted that an LCS sample and/or LCS duplicate was above the method specified criteria, however all sample results were non-detect and therefore the herbicide data quality was not affected.

Laboratory Control Sample Duplicates

Laboratory blank spike duplicates were processed during the laboratory analyses of dioxins and furans (PCDD/PCDF), pesticides, herbicides, and hexavalent chromium. The relative percent difference (RPD) between the laboratory blank spikes and the laboratory blank spike duplicates were within laboratory control limits with the exception of the herbicide analysis (see previous discussion of issue).

Matrix Spike Recoveries

A matrix spike was processed during the laboratory analysis of hexavalent chromium, and herbicides. The matrix spike recovery was within the laboratory control limit.

Other – Daily Calibration Sample

North Creek Analytical noted the herbicide analysis daily calibration sample results as potentially biased high, however further determined that since all the results were non-detect the herbicide data quality is not affected.

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: 6-21-05
Page: 1 of
Collected By: MJH/DJH

PORTLAND HARBOR INLINE

Project Name: ~~LOWER HARBOR OF~~ SED SAMP
File Number: 1020.001 Matrix: GRNDWTR / SEDIMENT

OUTFALL 22B CHAIN-OF-CUSTODY

Requested Analyses

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type	General: Pesticides/PCBs	Herbicides	SVOCs	VOCs	Dioxins/Furans			Metals: Total Metals (As, Cd, Cr, Cu, Ni, Pb, Sb, V, Zn)	Chromium VI			Field Comments
													MST9				
FO 050657	IL-22B-AAJ653-0605 5909 NW 61st Ave	22B_1	6-21-05	0928	G / Water	●	●	●	●	●			●	●			INFILTRATE SAMPLE
2	IL-OF22B-AMW708-0605 6400 NW FRONT AVE-N	22B_2			C	●											
3	IL-OF22B-AND879-0605 6400 NW FRONT AVE-M	22B_3			C	●											
4	IL-22B-AND878-0605 6400 NW FRONT AVE-S	22B_4			C	●											
5																	
6																	
7																	
8																	
9																	
10																	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.	Relinquished By: 4.
Signature: Time: 0945	Signature: Time: 10:19	Signature: Time:	Signature: Time:
Printed Name: MICHAEL HAUSER Date: 6-21-05	Printed Name: Peter Adams Date: 6/21/05	Printed Name: Date:	Printed Name: Date:
Received By: 1.	**Received By:** 2.	**Received By:** 3.	**Received By:** 4.
Signature: Time: 0945	Signature: Time: 1019	Signature: Time:	Signature: Time:
Printed Name: Date: 6/21/05	Printed Name: C. Christensen Date: 6/21/05	Printed Name: Date:	Printed Name: Date:

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City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 9:28 **System ID** AJ05976 **Sample ID** **FO050657**

Page: 1

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-22B-AAJ653-0605
5909 NW 61ST AVE - INFILTRATE

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 22B_1
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/DJH

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. NOTE: Pesticide results flagged as estimates are at concentrations below the method reporting limit.

Test Parameter	Result	Units	MRL	Method
METALS BY ICP-MS (TOTAL) - 9				
ANTIMONY	0.58	µg/L	0.1	EPA 200.8
ARSENIC	10.7	µg/L	0.1	EPA 200.8
CADMIUM	0.19	µg/L	0.1	EPA 200.8
CHROMIUM	<0.40	µg/L	0.4	EPA 200.8
COPPER	0.66	µg/L	0.2	EPA 200.8
LEAD	0.13	µg/L	0.1	EPA 200.8
MOLYBDENUM	110	µg/L	0.1	EPA 200.8
NICKEL	1.06	µg/L	0.2	EPA 200.8
VANADIUM	2.52	µg/L	0.2	EPA 200.8
ZINC	0.51	µg/L	0.5	EPA 200.8
OUTSIDE				
CHROMIUM VI	<0.0100	mg/L	0.010	EPA 7195
HERBICIDES - CHLORINATED				
2,4,5-T	<1.00	µg/L	1.00	EPA 8151
2,4,5-TP (Silvex)	<1.00	µg/L	1.00	EPA 8151
2,4-D	<1.00	µg/L	1.00	EPA 8151
2,4-DB	<1.00	µg/L	1.00	EPA 8151
Dalapon	<5.00	µg/L	5.00	EPA 8151
Dicamba	<1.00	µg/L	1.00	EPA 8151
Dichlorprop	<1.00	µg/L	1.00	EPA 8151
Dinoseb	<1.00	µg/L	1.00	EPA 8151
MCPA	<300	µg/L	300	EPA 8151
MCPP	<300	µg/L	300	EPA 8151
PCDD/PCDF (DIOXINS AND FURANS)				
1234678-HpCDD	<0.0500	ng/L	0.0500	EPA 1613B
1234678-HpCDF	<0.0500	ng/L	0.0500	EPA 1613B

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 9:28 **System ID** AJ05976 **Sample ID** **FO050657**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-22B-AAJ653-0605

5909 NW 61ST AVE - INFILTRATE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 22B_1
IMS File/Invoice #: 1020.001

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/DJH

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. NOTE: Pesticide results flagged as estimates are at concentrations below the method reporting limit.

Test Parameter	Result	Units	MRL	Method
1234789-HpCDF	<0.0500	ng/L	0.0500	EPA 1613B
123478-HxCDD	<0.0500	ng/L	0.0500	EPA 1613B
123478-HxCDF	<0.0500	ng/L	0.0500	EPA 1613B
123678-HxCDD	<0.0500	ng/L	0.0500	EPA 1613B
123678-HxCDF	<0.0500	ng/L	0.0500	EPA 1613B
123789-HxCDD	<0.0500	ng/L	0.0500	EPA 1613B
123789-HxCDF	<0.0500	ng/L	0.0500	EPA 1613B
12378-PeCDD	<0.0500	ng/L	0.0500	EPA 1613B
12378-PeCDF	<0.0500	ng/L	0.0500	EPA 1613B
234678-HxCDF	<0.0500	ng/L	0.0500	EPA 1613B
23478-PeCDF	<0.0500	ng/L	0.0500	EPA 1613B
2378-TCDD	<0.0099	ng/L	0.0099	EPA 1613B
2378-TCDF	<0.0099	ng/L	0.0099	EPA 1613B
OCDD	<0.0990	ng/L	0.0990	EPA 1613B
OCDF	<0.0990	ng/L	0.0990	EPA 1613B
TOTAL TEQ CONCENTRATION	0.0496	ng/L		EPA 1613B
PESTICIDES BY EPA 8081MOD				
2,4'-DDD	0.80	ng/L	0.12	EPA 8081M
2,4'-DDE	<0.29	ng/L	0.29	EPA 8081M
2,4'-DDT	EST 0.02	ng/L	0.13	EPA 8081M
4,4'-DDD	1.22	ng/L	0.07	EPA 8081M
4,4'-DDE	0.14	ng/L	0.14	EPA 8081M
4,4'-DDT	EST 0.02	ng/L	0.10	EPA 8081M
Aldrin	0.27	ng/L	0.11	EPA 8081M
Alpha-BHC	0.07	ng/L	0.06	EPA 8081M
Alpha-Chlordane	0.22	ng/L	0.11	EPA 8081M
Beta-BHC	<0.09	ng/L	0.09	EPA 8081M
Delta-BHC	<0.06	ng/L	0.06	EPA 8081M
Dieldrin	1.81	ng/L	0.09	EPA 8081M

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 9:28 **System ID** AJ05976 **Sample ID** **FO050657**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-22B-AAJ653-0605

5909 NW 61ST AVE - INFILTRATE

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 22B_1
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/DJH

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. NOTE: Pesticide results flagged as estimates are at concentrations below the method reporting limit.

Test Parameter	Result	Units	MRL	Method
Endosulfan I	0.29	ng/L	0.25	EPA 8081M
Endosulfan II	<0.25	ng/L	0.25	EPA 8081M
Endrin	1.35	ng/L	0.12	EPA 8081M
Endrin aldehyde	<0.12	ng/L	0.12	EPA 8081M
Endrin ketone	EST 0.06	ng/L	0.12	EPA 8081M
Gamma-BHC	<0.10	ng/L	0.10	EPA 8081M
Gamma-Chlordane	0.64	ng/L	0.09	EPA 8081M
Heptachlor	EST 0.09	ng/L	0.12	EPA 8081M
Heptachlor epoxide	0.29	ng/L	0.11	EPA 8081M
Methoxychlor	<0.29	ng/L	0.29	EPA 8081M
Toxaphene	<10.0	ng/L	10	EPA 8081M
SEMI-VOLATILE ORGANICS				
1,2,4-Trichlorobenzene	<1.00	µg/L	1.00	EPA 8270
1,2-Dichlorobenzene	1.25	µg/L	1.00	EPA 8270
1,3-Dichlorobenzene	<1.00	µg/L	1.00	EPA 8270
1,4-Dichlorobenzene	<1.00	µg/L	1.00	EPA 8270
2,3,4,6-Tetrachlorophenol	<2.00	µg/L	2.00	EPA 8270
2,4,5-Trichlorophenol	<1.00	µg/L	1.00	EPA 8270
2,4,6-Trichlorophenol	<1.00	µg/L	1.00	EPA 8270
2,4-Dichlorophenol	<1.00	µg/L	1.00	EPA 8270
2,4-Dimethylphenol	<2.00	µg/L	2.00	EPA 8270
2,4-Dinitrophenol	<4.00	µg/L	4.00	EPA 8270
2,4-Dinitrotoluene	<1.00	µg/L	1.00	EPA 8270
2,6-Dichlorophenol	<1.00	µg/L	1.00	EPA 8270
2,6-Dinitrotoluene	<1.00	µg/L	1.00	EPA 8270
2-Chloronaphthalene	<1.00	µg/L	1.00	EPA 8270
2-Chlorophenol	<1.00	µg/L	1.00	EPA 8270
2-Methylnaphthalene	<2.00	µg/L	2.00	EPA 8270
2-Methylphenol	<2.00	µg/L	2.00	EPA 8270

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 9:28 **System ID** AJ05976 **Sample ID** **FO050657**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-22B-AAJ653-0605
5909 NW 61ST AVE - INFILTRATE

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 22B_1
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/DJH

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. NOTE: Pesticide results flagged as estimates are at concentrations below the method reporting limit.

Test Parameter	Result	Units	MRL	Method
2-Nitroaniline	<1.00	µg/L	1.00	EPA 8270
2-Nitrophenol	<1.00	µg/L	1.00	EPA 8270
3,3'-Dichlorobenzidine	<1.00	µg/L	1.00	EPA 8270
3-,4-Methylphenol	<2.00	µg/L	2.00	EPA 8270
3-Nitroaniline	<1.00	µg/L	1.00	EPA 8270
4,6-Dinitro-2-methylphenol	<2.00	µg/L	2.00	EPA 8270
4-Bromophenylphenyl ether	<1.00	µg/L	1.00	EPA 8270
4-Chloro-3-methylphenol	5.97	µg/L	1.00	EPA 8270
4-Chloroaniline	<2.00	µg/L	2.00	EPA 8270
4-Chlorophenylphenyl ether	<1.00	µg/L	1.00	EPA 8270
4-Nitroaniline	<2.00	µg/L	2.00	EPA 8270
4-Nitrophenol	<4.00	µg/L	4.00	EPA 8270
Acenaphthene	<1.00	µg/L	1.00	EPA 8270
Acenaphthylene	<1.00	µg/L	1.00	EPA 8270
Anthracene	<1.00	µg/L	1.00	EPA 8270
Benzo(a)anthracene	<1.00	µg/L	1.00	EPA 8270
Benzo(a)pyrene	<1.00	µg/L	1.00	EPA 8270
Benzo(b)fluoranthene	<1.00	µg/L	1.00	EPA 8270
Benzo(g,h,i)perylene	<1.00	µg/L	1.00	EPA 8270
Benzo(k)fluoranthene	<1.00	µg/L	1.00	EPA 8270
Benzoic acid	<4.00	µg/L	4.00	EPA 8270
Benzyl alcohol	<2.00	µg/L	2.00	EPA 8270
Bis(2-chloroethoxy) methane	<2.00	µg/L	2.00	EPA 8270
Bis(2-chloroethyl) ether	<1.00	µg/L	1.00	EPA 8270
Bis(2-chloroisopropyl) ether	<2.00	µg/L	2.00	EPA 8270
Bis(2-ethylhexyl) phthalate	<2.00	µg/L	2.00	EPA 8270
Butyl benzyl phthalate	<2.00	µg/L	2.00	EPA 8270
Chrysene	<1.00	µg/L	1.00	EPA 8270
Dibenzo(a,h)anthracene	<1.00	µg/L	1.00	EPA 8270

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 9:28 **System ID** AJ05976 **Sample ID** **FO050657**

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Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-22B-AAJ653-0605

5909 NW 61ST AVE - INFILTRATE

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 22B_1
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/DJH

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. NOTE: Pesticide results flagged as estimates are at concentrations below the method reporting limit.

Test Parameter	Result	Units	MRL	Method
Dibenzofuran	<2.00	µg/L	2.00	EPA 8270
Diethyl phthalate	<1.00	µg/L	1.00	EPA 8270
Dimethyl phthalate	<1.00	µg/L	1.00	EPA 8270
Di-n-butyl phthalate	<2.00	µg/L	2.00	EPA 8270
Di-n-octyl phthalate	<1.00	µg/L	1.00	EPA 8270
Fluoranthene	<1.00	µg/L	1.00	EPA 8270
Fluorene	<1.00	µg/L	1.00	EPA 8270
Hexachlorobenzene	<1.00	µg/L	1.00	EPA 8270
Hexachlorobutadiene	<2.00	µg/L	2.00	EPA 8270
Hexachlorocyclopentadiene	<2.00	µg/L	2.00	EPA 8270
Hexachloroethane	<2.00	µg/L	2.00	EPA 8270
Indeno(1,2,3-cd)pyrene	<1.00	µg/L	1.00	EPA 8270
Isophorone	<1.00	µg/L	1.00	EPA 8270
Naphthalene	<1.00	µg/L	1.00	EPA 8270
Nitrobenzene	<1.00	µg/L	1.00	EPA 8270
N-Nitrosodi-n-propylamine	<2.00	µg/L	2.00	EPA 8270
N-Nitrosodiphenylamine	<1.00	µg/L	1.00	EPA 8270
Pentachlorophenol	<2.00	µg/L	2.00	EPA 8270
Phenanthrene	<1.00	µg/L	1.00	EPA 8270
Phenol	<1.00	µg/L	1.00	EPA 8270
Pyrene	<1.00	µg/L	1.00	EPA 8270
VOLATILE ORGANIC COMPOUNDS				
1,1,1,2-Tetrachloroethane	<1.0	µg/L	1.00	EPA 8260
1,1,1-Trichloroethane	<2.0	µg/L	2.00	EPA 8260
1,1,2,2-Tetrachloroethane	<1.0	µg/L	1.00	EPA 8260
1,1,2-Trichloroethane	<1.0	µg/L	1.00	EPA 8260
1,1,2-Trichlorotrifluoroethane	<2.0	µg/L	2.00	EPA 8260
1,1-Dichloroethane	<1.0	µg/L	1.00	EPA 8260
1,1-Dichloroethene	<2.0	µg/L	2.00	EPA 8260

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 9:28 **System ID** AJ05976 **Sample ID** **FO050657**

Page: 6

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-22B-AAJ653-0605

5909 NW 61ST AVE - INFILTRATE

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 22B_1
IMS File/Invoice #: 1020.001

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/DJH

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. NOTE: Pesticide results flagged as estimates are at concentrations below the method reporting limit.

Test Parameter	Result	Units	MRL	Method
1,1-Dichloropropene	<1.0	µg/L	1.00	EPA 8260
1,2,3-Trichlorobenzene	<1.0	µg/L	1.00	EPA 8260
1,2,3-Trichloropropane	<1.0	µg/L	1.00	EPA 8260
1,2,4-Trichlorobenzene	<1.0	µg/L	1.00	EPA 8260
1,2,4-Trimethylbenzene	<1.0	µg/L	1.00	EPA 8260
1,2-Dibromo-3-chloropropane	<1.0	µg/L	1.00	EPA 8260
1,2-Dibromoethane	<1.0	µg/L	1.00	EPA 8260
1,2-Dichlorobenzene	2.15	µg/L	1.00	EPA 8260
1,2-Dichloroethane	<1.0	µg/L	1.00	EPA 8260
1,2-Dichloropropane	<1.0	µg/L	1.00	EPA 8260
1,3,5-Trimethylbenzene	<1.0	µg/L	1.00	EPA 8260
1,3-Dichlorobenzene	<1.0	µg/L	1.00	EPA 8260
1,3-Dichloropropane	<1.0	µg/L	1.00	EPA 8260
1,4-Dichlorobenzene	<1.0	µg/L	1.00	EPA 8260
2,2-Dichloropropane	<1.0	µg/L	1.00	EPA 8260
2-Butanone	<10.0	µg/L	10.0	EPA 8260
2-Chlorotoluene	<1.0	µg/L	1.00	EPA 8260
2-Hexanone	<10.0	µg/L	10.0	EPA 8260
4-Chlorotoluene	<1.0	µg/L	1.00	EPA 8260
4-Isopropyltoluene	<1.0	µg/L	1.00	EPA 8260
4-Methyl-2-pentanone (MIBK)	<10.0	µg/L	10.0	EPA 8260
Acetone	<20.0	µg/L	20.0	EPA 8260
Benzene	<1.0	µg/L	1.00	EPA 8260
Bromobenzene	<1.0	µg/L	1.00	EPA 8260
Bromochloromethane	<1.0	µg/L	1.00	EPA 8260
Bromodichloromethane	<1.0	µg/L	1.00	EPA 8260
Bromoform	<1.0	µg/L	1.00	EPA 8260
Bromomethane	<1.0	µg/L	1.00	EPA 8260
Carbon disulfide	<5.0	µg/L	5.00	EPA 8260

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 9:28 **System ID** AJ05976 **Sample ID** **FO050657**

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-22B-AAJ653-0605
5909 NW 61ST AVE - INFILTRATE

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 22B_1
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/DJH

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. NOTE: Pesticide results flagged as estimates are at concentrations below the method reporting limit.

Test Parameter	Result	Units	MRL	Method
Carbon tetrachloride	<1.0	µg/L	1.00	EPA 8260
Chlorobenzene	<1.0	µg/L	1.00	EPA 8260
Chloroethane	<2.0	µg/L	2.00	EPA 8260
Chloroform	<1.0	µg/L	1.00	EPA 8260
Chloromethane	<2.0	µg/L	2.00	EPA 8260
cis-1,2-Dichloroethene	<1.0	µg/L	1.00	EPA 8260
cis-1,3-Dichloropropene	<1.0	µg/L	1.00	EPA 8260
Dibromochloromethane	<1.0	µg/L	1.00	EPA 8260
Dibromomethane	<1.0	µg/L	1.00	EPA 8260
Dichlorodifluoromethane	<2.0	µg/L	2.00	EPA 8260
Ethylbenzene	<1.0	µg/L	1.00	EPA 8260
Hexachlorobutadiene	<1.0	µg/L	1.00	EPA 8260
Isopropylbenzene	<1.0	µg/L	1.00	EPA 8260
m,p-Xylene	<2.0	µg/L	2.00	EPA 8260
Methylene chloride	<2.0	µg/L	2.00	EPA 8260
Naphthalene	<1.0	µg/L	1.00	EPA 8260
n-Butylbenzene	<1.0	µg/L	1.00	EPA 8260
n-Propylbenzene	<1.0	µg/L	1.00	EPA 8260
o-Xylene	<1.0	µg/L	1.00	EPA 8260
sec-Butylbenzene	<1.0	µg/L	1.00	EPA 8260
Styrene	<1.0	µg/L	1.00	EPA 8260
tert-Butylbenzene	<1.0	µg/L	1.00	EPA 8260
Tetrachloroethene	<1.0	µg/L	1.00	EPA 8260
Toluene	<1.0	µg/L	1.00	EPA 8260
trans-1,2-Dichloroethene	<1.0	µg/L	1.00	EPA 8260
trans-1,3-Dichloropropene	<1.0	µg/L	1.00	EPA 8260
trans-1,4-Dichloro-2-butene	<1.0	µg/L	1.00	EPA 8260
Trichloroethene	<1.0	µg/L	1.00	EPA 8260
Trichlorofluoromethane	<1.0	µg/L	1.00	EPA 8260

City of Portland
Water Pollution Control Laboratory
Laboratory Analysis Report

Sample Date/Time 6/21/2005 9:28 **System ID** AJ05976 **Sample ID** **FO050657**

Page: 8

Proj./Company Name: PORTLAND HARBOR INLINE SAMP
Address/Location: IL-22B-AAJ653-0605

5909 NW 61ST AVE - INFILTRATE

Date Received: 6/21/2005
Sample Status: COMPLETE AND VALIDATED

Proj Subcategory: REGULATORY PLAN & EVAL
Sample Point Code: 22B_1
IMS File/Invoice #: 1020.001

Sample Type: GRAB
Sample Matrix: OTHER
Collected By: MJH/DJH

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. NOTE: Pesticide results flagged as estimates are at concentrations below the method reporting limit.

Test Parameter	Result	Units	MRL	Method
Vinyl Acetate	<2.0	µg/L	2.00	EPA 8260
Vinyl chloride	<1.0	µg/L	1.00	EPA 8260

End of Report for Sample ID: FO050657

6543 N. Burlington Ave. / Portland OR 97203 (503) 823-5600 fax (503) 823-5656

Report Date: 8/25/2005

Validated By: Signature on File

WPCL FO 050657

NCA/City of Portland

Case Narrative: Pesticides

I. Background

This report contains the pesticide results of the analyses of 1 water sample. This sample was part of sample delivery group SDG F6221. It was analyzed as one QC batch, M3340. This sample was extracted on 6/28/05 and analyzed on 6/29/05.

II. Analytical Results/Methodology

The water samples were extracted and analyzed following the procedures contained in GERG SOP 9014 and SOP 9810. The analyte concentrations were determined using the surrogate, PCB 103, added to the sample prior to extraction.

III. Quality Control

Calibrations

The instrument calibration is performed using a regression calibration curve because the ECD is a non-linear detector. The regression applied was a quadratic regression:

$$y=b_0 + \Sigma\, b_i x^i$$

where i has a value of 2 for a quadratic type curve. The calibration allows both the x and y variables to be optionally transformed prior to fitting the calibration curve. The curve is then fitted to the transformed data and the calibration statistics reported apply to the transformed data.

The two calibration statistics calculated are the coefficient of determination (r^2) and the standard error of the y estimate (SE). The standard error of the y estimate provides a measure of the deviation of the calibration curve. It is expressed by the following equation:

$$SE = (RSS / (n-p-1))^{1/2}$$

where RSS is the residual sum of the squares, n is the number of data points in the calibration (including zero if a force through zero is used), and p is the degree of the polynomial fit for the regression.

The coefficient of determination (r^2) represents the proportion of the variation accounted for by the regression, and is a ratio of the model sum of the squares (MSS) to the corrected sum of squares (CSS):

$$r^2 = MSS/CSS$$

$$r^2 = (CSS-RSS)/CSS$$

where the following definitions apply:

$RSS = \Sigma (y_i-y_{i,pred})^2$

$CSS = \Sigma (y_i-y_{i,mean})^2$

where y is a data point; $y_{i,pred}$ is a data point predicted from the value of y; $(y_i-y_{i,pred})$ is the residual between actual and predicted; $y_{i,mean}$ is the mean value of y; and $(y_i-y_{i,mean})$ is the corrected difference. Calibration data met the calibration criteria with none exceeding the control limits. The average percent deviation was less than 15%, and no analyte had a percent deviation greater than 25%.

Example Calculations

The analytes are calculated using a quadratic equation of the form:

$$y=b_0 + (b_1 * x) + (b_2 * x^2)$$

where:

y = The ratio of the area of the analyte to the area of the internal standard times the amount of the internal standard in micrograms;

b_0, b_1, b_2 = coefficients for the quadratic equation;

x = is the amount of the analyte in micrograms.

The calibration standards analyzed with each set of samples are subjected to the method of least squares for the equation for each analyte. Each analyte has different coefficients (b_0, b_1, b_2) based on the relative response of the analyte compared to the internal standard and as a function of the amount of the analyte. The amount of the internal standard is held constant for the calibration standards.

The sample concentration is calculated using the equation:

$$concentration = x * df / wt$$

where:

concentration = the concentration of the analyte (ng/g or ng/L);

x = amount of the analyte as found from solving the quadratic equation;

df = dilution factor;

wt = the sample dry weight in grams or volume in L.

Laboratory Qualifiers

All of the analytical data have been qualified based on the most recent method detection limits determined. Concentrations that were less than the MDL adjusted for sample sizes are qualified "J" and those analytes not detected are qualified "ND". Concentrations that exceeded the calibration limits are qualified "EC". The concentrations that are determined by analyses of a diluted aliquot are qualified "D". If interference is encountered with the quantification of an analyte due to high concentration of another analyte, the concentration is qualified "I" to denote this interference.

Analytical Difficulties

All surrogate recoveries were within the acceptable range. No further action was required. In the procedural blank contained no analytes detected at concentrations greater than 3 times the MDL. No further action was taken. The recoveries of analytes in the laboratory spike blank (LBS) and laboratory spike blank duplicate (LBSD) were all within the acceptable range. There was interference with 2,4-DDE on the GC/ECD analyses. This was shown not to be 2,4-DDE by GC/MS and was not reported. No other variances or difficulties were observed.

IV. Discussion

Care should be taken in interpretation of these water samples pesticide concentrations. Most analytes were only present at low parts per trillion (ng/L or ng/Kg) concentrations. Most concentrations were close to the detection limit.

Reviewed and approved: Terry L. Wade 7/12/05

Terry L. Wade, Ph.D. Date

Deputy Director, Environmental Sciences

NCA/City of Portland

Client Sample ID	P5F0947-01 B
Sample Descriptor	9:28
Original Sample	
GERG ID	C46244
Sample Type	SAMP
SDG	F6221
Volume	1.00
Sample Size Units	Liters
Matrix	Water
Reporting Units	ng/L
Calculation Basis (dry/wet)	Wet
QC Batch ID	M3340
Method	GCECD
Collection Date	6/21/2005
Receive Date	6/24/2005
Extraction Date	6/28/2005
Analysis Date	6/29/2005

Surrogate Compounds	**%Recovery**
DBOFB	108.0
PCB103*	117.5
PCB198	117.6

Totals	**Concentration**	**DL**	**DB Qual**
Toxaphene		10.00	ND

Pesticides	**Concentration**	**DL**	
Chlorinated Benzenes			
Tetrachlorobenzene 1,2,4,5	0.76	0.24	
Tetrachlorobenzene 1,2,3,4		0.16	ND
Pentachlorobenzene	0.10	0.19	J
Hexachlorobenzene	0.63	0.15	
Hexachlorocyclohexanes			
Alpha HCH	0.07	0.06	
Beta HCH		0.09	ND
Gamma HCH		0.10	ND
Delta HCH		0.06	ND
Chlordane-related Compounds			
Heptachlor	0.09	0.12	J
Heptachlor Epoxide	0.29	0.11	
Oxychlordane	0.08	0.09	J
Alpha Chlordane	0.22	0.11	
Gamma Chlordane	0.64	0.09	
Cis-Nonachlor	0.01	0.11	J
Trans-Nonachlor	0.12	0.11	
Other Cyclodiene Pesticides			
Aldrin	0.27	0.11	
Dieldrin	1.81	0.09	
Endrin	1.35	0.12	
Endrin Ketone	0.06	0.12	J
Endrin Aldehyde		0.12	ND

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
d Dilution
EC Exceeds Calibration

NCA/City of Portland

Client Sample ID	P5F0947-01 B
Sample Descriptor	9:28
Original Sample	
GERG ID	C46244
Sample Type	SAMP
SDG	F6221

Pesticides	Concentration	DL	
Other Chlorinated Pesticides			
Pentachloroanisole	0.19	0.07	
Chlorpyrifos	1.39	0.35	
Mirex		0.15	ND
Endosulfan I	0.29	0.25	
Endosulfan II		0.25	ND
Methoxychlor		0.29	ND
DDTs and Related Compounds			
2,4' DDE		0.29	ND
4,4' DDE	0.14	0.14	J
2,4' DDD	0.80	0.12	
4,4' DDD	1.22	0.07	
2,4' DDT	0.02	0.13	J
4,4' DDT	0.02	0.10	J
DDMU	1.42	0.29	

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
d Dilution
EC Exceeds Calibration

NCA/City of Portland

Client Sample ID			
Sample Descriptor	Proc Blank	Blank Spike	Blank Spike Dup
Original Sample			
GERG ID	Q22162	Q22163	Q22164
Sample Type	BLANK	LBS	LBSD
SDG			
Volume	1.00	1.00	1.00
Sample Size Units	Liters	Liters	Liters
Matrix	Water	Water	Water
Reporting Units	ng/L	%	%
Calculation Basis (dry/wet)	Wet	Wet	Wet
QC Batch ID	M3340	M3340	M3340
Method	GCECD	GCECD	GCECD
Collection Date			
Receive Date			
Extraction Date	38531.0	38531.0	38531.0
Analysis Date	38532.0	38532.0	38532.0
Surrogate Compounds	% Recovery	% Recovery	% Recovery
DBOFB	72.3	63.1	54.7
PCB103*	79.6	76.5	68.2
PCB198	77.9	71.7	79.5

Totals	**Concentration**	**DL**	**DB Qual**	**% Recovery**	**DB Qual**	**% Recovery**	**DB Qual**	**%RPD**	**DB Qual**
Toxaphene		10.00	ND		NA		NA		NA

Pesticides	**Concentration**	**DL**		**% Recovery**		**% Recovery**		**%RPD**	
Chlorinated Benzenes									
Tetrachlorobenzene 1,2,4,5		0.24	ND	58.9		59.0		0.3	
Tetrachlorobenzene 1,2,3,4		0.16	ND	60.7		58.4		3.9	
Pentachlorobenzene		0.19	ND	61.6		59.6		3.3	
Hexachlorobenzene		0.15	ND	68.6		67.1		2.3	
Hexachlorocyclohexanes									
Alpha HCH		0.06	ND	78.8		72.0		9.1	
Beta HCH		0.09	ND	90.9		85.4		6.2	
Gamma HCH		0.10	ND	85.1		77.6		9.3	
Delta HCH		0.06	ND	87.0		79.8		8.7	
Chlordane-related Compounds									
Heptachlor		0.12	ND	81.7		78.2		4.4	
Heptachlor Epoxide		0.11	ND	95.6		109.5		13.5	
Oxychlordane		0.09	ND	92.7		94.4		1.8	
Alpha Chlordane		0.11	ND	90.4		92.4		2.2	
Gamma Chlordane		0.09	ND	88.7		90.9		2.4	
Cis-Nonachlor		0.11	ND	91.7		100.3		8.9	
Trans-Nonachlor		0.11	ND	89.6		91.5		2.0	
Other Cyclodiene Pesticides									
Aldrin		0.11	ND	68.6		67.6		1.5	
Dieldrin		0.09	ND	95.2		115.3		19.1	
Endrin		0.12	ND	90.8		108.5		17.8	
Endrin Ketone		0.12	ND		NA		NA		NA
Endrin Aldehyde		0.12	ND		NA		NA		NA

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
d Dilution
EC Exceeds Calibration

NCA/City of Portland

Client Sample ID			
Sample Descriptor	Proc Blank	Blank Spike	Blank Spike Dup
Original Sample			
GERG ID	Q22162	Q22163	Q22164
Sample Type	BLANK	LBS	LBSD
SDG			

Pesticides	Concentration	DL		% Recovery		% Recovery		%RPD	
Other Chlorinated Pesticides									
Pentachloroanisole	0.14	0.07	<3xMDL	78.7		76.3		3.1	
Chlorpyrifos		0.35	ND	84.6		96.8		13.5	
Mirex		0.15	ND	95.5		105.6		10.0	
Endosulfan I		0.25	ND	80.2		92.5		14.3	
Endosulfan II		0.25	ND		NA		NA		NA
Methoxychlor		0.29	ND		NA		NA		NA
DDTs and Related Compounds									
2,4' DDE		0.29	ND	90.0		90.5		0.6	
4,4' DDE		0.14	ND	82.0		88.3		7.4	
2,4' DDD		0.12	ND	97.4		108.8		11.0	
4,4' DDD		0.07	ND	94.9		108.6		13.5	
2,4' DDT		0.13	ND	94.3		107.6		13.2	
4,4' DDT		0.10	ND	87.1		100.9		14.7	
DDMU		0.29	ND		NA		NA		NA
		Average % Recovery		**84.3**		**88.7**		**7.8**	

ND Not Detected
J <MDL
NA Not Applicable
Q Results Outside QC
I Interference
B Blank Contamination >3xMDL
d Dilution
EC Exceeds Calibration

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DETERMINATION OF PCDD/PCDF LEVELS

Prepared for:
North Creek Analytical - Portland
Attn: Howard Holmes
9405 SW Nimbus Avenue
Beaverton, OR 97008

ACCREDITED IN ACCORDANCE WITH nelac

This report contains 13 pages.

The results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Project: Chemical Analysis

Client Project Number: P5F0859

REPORT OF LABORATORY ANALYSIS

nelac

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REPORT OF: CHEMICAL ANALYSES

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

PROJECT: PCDD/PCDF ANALYSES

DATE: July 14, 2005

ISSUED TO: North Creek Analytical - Portland
Attn: Howard Holmes
9405 SW Nimbus Avenue
Beaverton, OR 97008

REPORT NO: 05-1015282

INTRODUCTION

This report presents the results from the analyses performed on one sample submitted by a representative of North Creek Analytical. The sample was analyzed for the presence or absence of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) using a modified version of USEPA Method 1613B.

SAMPLE IDENTIFICATION

Client ID	Sample Type	Date Received	PACE ID
P5F0859-01 FO 050657	Water	06/22/05	1015282001

DISCUSSION

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extract ranged from 66-97%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results, found at the beginning of Appendix B, show the blank to be free of PCDDs and PCDFs at the reporting limits. These results indicate that the sample processing steps did not contribute significantly to the levels reported for the field sample.

REPORT OF LABORATORY ANALYSIS

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REPORT OF: CHEMICAL ANALYSES

PROJECT: PCDD/PCDF ANALYSES

DATE: July 14, 2005

REPORT NO: 05-1015282

DISCUSSION (Cont.)

Laboratory spike samples were also prepared with the sample batch using clean laboratory water that had been fortified with native standard materials. The results show that the spiked native compounds were recovered at 94-118%, with relative percent differences of 0.0-6.8%. These results indicate high degrees of accuracy and precision for these determinations.

REMARKS

The sample extract will be retained for a period of 15 days from the date of this report and then discarded unless other arrangements are made. The raw mass spectral data will be archived on magnetic tape for a period of not less than one year. Questions regarding the data contained in this report may be directed to the author at the number provided below.

Pace Analytical Services, Inc.

Scott C. Unze
Project Manager, HRMS
(612) 607-6383

REPORT OF LABORATORY ANALYSIS

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TABLE 1. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

REPORT OF LABORATORY ANALYSIS

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APPENDIX A

REPORT OF LABORATORY ANALYSIS

ACCREDITED IN ACCORDANCE WITH nelac

SUBCONTRACT ORDER

North Creek Analytical - Portland

P5F0859

SENDING LABORATORY:

North Creek Analytical - 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- Minneapolis
1700 Elm Street Suite 200
Minneapolis, MN 55414
Phone :(612) 607-1700
Fax: (612) 607-6444

1015282

Analysis	Due	Expires	Laboratory ID	Comments
			[redacted]	001
Sample ID: P5F0859-01	**Water**	**Sampled:06/21/05 09:28**		[redacted]
1613 Dioxin	07/06/05 16:00	12/18/05 09:28		Dioxins and Furans
Containers Supplied:				
1L Amber - Unpres. (B)				

City of Portland ID: FO 050657

Temp 5°C

Released By	Date	Received By	Date
[signature]	6-21-05	Bright Flexu	6/22/05 10:10
Released By	Date	Received By	Date

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APPENDIX B

REPORT OF LABORATORY ANALYSIS

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

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

Pace Analytical™

Method 1613B Blank Analysis Results

Client - North Creek Analytical

Lab Sample ID	BLANK-7476	Matrix	Water
Filename	U50706A_16	Dilution	NA
Total Amount Extracted	988 mL	Extracted	06/30/2005
ICAL Date	07/06/2005	Analyzed	07/06/2005 21:07
CCal Filename(s)	U50706A_10	Injected By	SMT

Native Isomers	Conc ng/L	EMPC ng/L	PRL ng/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.010	2,3,7,8-TCDF-13C	2.00	51
				2,3,7,8-TCDD-13C	2.00	58
				1,2,3,7,8-PeCDF-13C	2.00	66
2,3,7,8-TCDD	ND	-----	0.010	2,3,4,7,8-PeCDF-13C	2.00	75
				1,2,3,7,8-PeCDD-13C	2.00	87
				1,2,3,4,7,8-HxCDF-13C	2.00	89
1,2,3,7,8-PeCDF	ND	-----	0.051	1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	-----	0.051	2,3,4,6,7,8-HxCDF-13C	2.00	84
				1,2,3,7,8,9-HxCDF-13C	2.00	84
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	-----	0.051	1,2,3,6,7,8-HxCDD-13C	2.00	81
				1,2,3,4,6,7,8-HpCDF-13C	2.00	80
				1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	-----	0.051	1,2,3,4,6,7,8-HpCDD-13C	2.00	86
1,2,3,6,7,8-HxCDF	ND	-----	0.051	OCDD-13C	4.00	88
2,3,4,6,7,8-HxCDF	ND	-----	0.051			
1,2,3,7,8,9-HxCDF	ND	-----	0.051	1,2,3,4-TCDD-13C	2.00	NA
				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.051	2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	ND	-----	0.051			
1,2,3,7,8,9-HxCDD	ND	-----	0.051			
1,2,3,4,6,7,8-HpCDF	ND	-----	0.051	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.051	Equivalence: 0.051 ng/L		
				(Using ITE Factors - Using PRL/2 where ND)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.051			
OCDF	ND	-----	0.100			
OCDD	ND	-----	0.100			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
PRL = Pace Analytical Reporting Limit
A = Limit of Detection based on signal to noise
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
J = Value below calibration range
* = See Discussion

Report No.....1015282

REPORT OF LABORATORY ANALYSIS

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

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

Pace Analytical™

Method 1613B Analysis Results

Client - North Creek Analytical

Client's Sample ID	P5F0859-01 FO 050657		
Lab Sample ID	1015282001		
Filename	U50708B_05		
Injected By	SMT		
Total Amount Extracted	1010 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	06/21/2005
ICAL Date	07/06/2005	Received	06/22/2005
CCal Filename(s)	U50708A_17	Extracted	06/30/2005
Method Blank ID	BLANK-7476	Analyzed	07/09/2005 04:53

Native Isomers	Conc ng/L	EMPC ng/L	PRL ng/L	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0099	2,3,7,8-TCDF-13C	2.00	66
				2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	79
2,3,7,8-TCDD	ND	-----	0.0099	2,3,4,7,8-PeCDF-13C	2.00	86
				1,2,3,7,8-PeCDD-13C	2.00	94
				1,2,3,4,7,8-HxCDF-13C	2.00	97
1,2,3,7,8-PeCDF	ND	-----	0.0500	1,2,3,6,7,8-HxCDF-13C	2.00	96
2,3,4,7,8-PeCDF	ND	-----	0.0500	2,3,4,6,7,8-HxCDF-13C	2.00	93
				1,2,3,7,8,9-HxCDF-13C	2.00	95
				1,2,3,4,7,8-HxCDD-13C	2.00	87
1,2,3,7,8-PeCDD	ND	-----	0.0500	1,2,3,6,7,8-HxCDD-13C	2.00	83
				1,2,3,4,6,7,8-HpCDF-13C	2.00	83
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	0.0500	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	-----	0.0500	OCDD-13C	4.00	89
2,3,4,6,7,8-HxCDF	ND	-----	0.0500			
1,2,3,7,8,9-HxCDF	ND	-----	0.0500	1,2,3,4-TCDD-13C	2.00	NA
				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0500	2,3,7,8-TCDD-37Cl4	0.20	88
1,2,3,6,7,8-HxCDD	ND	-----	0.0500			
1,2,3,7,8,9-HxCDD	ND	-----	0.0500			
1,2,3,4,6,7,8-HpCDF	ND	-----	0.0500	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0500	Equivalence: 0.050 ng/L		
				(Using ITE Factors - Using PRL/2 where ND)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.0500			
OCDF	ND	-----	0.0990			
OCDD	ND	-----	0.0990			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
PRL = Pace Analytical Reporting Limit.
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
P = Recovery outside of method 1613 control limits
Nn = Value obtained from additional analysis

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
J = Value below calibration range
* = See Discussion

Report No.....1015282

REPORT OF LABORATORY ANALYSIS

Pace Analytical™

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

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

2,3,7,8-TCDD Toxic Equivalency (TEQ) Calculations

Using 1989 ITE Factors

Client's Sample ID	P5F0859-01 FO 050657
Lab Sample ID	1015282001
Filename	U50708B_05
Injected By	SMT
Total Amount Extracted	1010 mL
% Moisture	NA
Dry Weight Extracted	NA
ICAL Date	07/06/2005
CCal Filename(s)	U50708A_17
Method Blank ID	BLANK-7476

Total TEQ Conc.: 0.0496 ng/L

Matrix	Water
Dilution	NA
Collected	06/21/2005
Received	06/22/2005
Extracted	06/30/2005
Analyzed	07/09/2005 04:53

Analyte	Conc ng/L	PRL ng/L	TEF Factor	TEQ Conc. ng/L
OCDD	ND	0.0990	0.0010	0.0000
Total HpCDD	--	--	0.0000	0.0000
1,2,3,4,6,7,8-HpCDD	ND	0.0500	0.0100	0.0002
Total HxCDD	--	--	0.0000	0.0000
1,2,3,4,7,8-HxCDD	ND	0.0500	0.1000	0.0025
1,2,3,6,7,8-HxCDD	ND	0.0500	0.1000	0.0025
1,2,3,7,8,9-HxCDD	ND	0.0500	0.1000	0.0025
Total PeCDD	--	--	0.0000	0.0000
1,2,3,7,8-PeCDD	ND	0.0500	0.5000	0.0124
Total TCDD	--	--	0.0000	0.0000
2,3,7,8-TCDD	ND	0.0099	1.0000	0.0050
OCDF	ND	0.0990	0.0010	0.0000
Total HpCDF	--	--	0.0000	0.0000
1,2,3,4,6,7,8-HpCDF	ND	0.0500	0.0100	0.0002
1,2,3,4,7,8,9-HpCDF	ND	0.0500	0.0100	0.0002
Total HxCDF	--	--	0.0000	0.0000
1,2,3,4,7,8-HxCDF	ND	0.0500	0.1000	0.0025
1,2,3,6,7,8-HxCDF	ND	0.0500	0.1000	0.0025
2,3,4,6,7,8-HxCDF	ND	0.0500	0.1000	0.0025
1,2,3,7,8,9-HxCDF	ND	0.0500	0.1000	0.0025
Total PeCDF	--	--	0.0000	0.0000
1,2,3,7,8-PeCDF	ND	0.0500	0.0500	0.0012
2,3,4,7,8-PeCDF	ND	0.0500	0.5000	0.0124
Total TCDF	--	--	0.0000	0.0000
2,3,7,8-TCDF	ND	0.0099	0.1000	0.0005

Final values are valid to only 2 significant figures
TEQs for Totals classes include contributions from non 2,3,7,8 isomers only
Where "ND", TEQ Conc = (PRL/2) * (TEF Factor)

Report No.....1015282

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Fax: 612-607-6444

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - North Creek Analytical

Lab Sample ID	LCS-7477		
Filename	U50706A_12	Matrix	Water
Total Amount Extracted	963 mL	Dilution	NA
ICAL Date	07/06/2005	Extracted	06/30/2005
CCal Filename	U50706A_10	Analyzed	07/06/2005 17:44
Method Blank ID	BLANK-7476	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	11.4	7.5	15.8	114
2,3,7,8-TCDD	10	10.2	6.7	15.8	102
1,2,3,7,8-PeCDF	50	56.2	40.0	67.0	112
2,3,4,7,8-PeCDF	50	52.3	34.0	80.0	105
1,2,3,7,8-PeCDD	50	47.0	35.0	71.0	94
1,2,3,4,7,8-HxCDF	50	47.7	36.0	67.0	95
1,2,3,6,7,8-HxCDF	50	53.8	42.0	65.0	108
2,3,4,6,7,8-HxCDF	50	50.4	35.0	78.0	101
1,2,3,7,8,9-HxCDF	50	49.7	39.0	65.0	99
1,2,3,4,7,8-HxCDD	50	53.2	35.0	82.0	106
1,2,3,6,7,8-HxCDD	50	57.1	38.0	67.0	114
1,2,3,7,8,9-HxCDD	50	54.4	32.0	81.0	109
1,2,3,4,6,7,8-HpCDF	50	56.9	41.0	61.0	114
1,2,3,4,7,8,9-HpCDF	50	59.1	39.0	69.0	118
1,2,3,4,6,7,8-HpCDD	50	49.0	35.0	70.0	98
OCDF	100	101.4	63.0	170.0	101
OCDD	100	95.9	78.0	144.0	96
2,3,7,8-TCDD-37Cl4	10	8.0	3.1	19.1	80
2,3,7,8-TCDF-13C	100	42.3	22.0	152.0	42
2,3,7,8-TCDD-13C	100	45.7	20.0	175.0	46
1,2,3,7,8-PeCDF-13C	100	57.2	21.0	192.0	57
2,3,4,7,8-PeCDF-13C	100	66.9	13.0	328.0	67
1,2,3,7,8-PeCDD-13C	100	73.0	21.0	227.0	73
1,2,3,4,7,8-HxCDF-13C	100	83.5	19.0	202.0	84
1,2,3,6,7,8-HxCDF-13C	100	79.9	21.0	159.0	80
2,3,4,6,7,8-HxCDF-13C	100	87.8	22.0	176.0	88
1,2,3,7,8,9-HxCDF-13C	100	86.6	17.0	205.0	87
1,2,3,4,7,8-HxCDD-13C	100	83.9	21.0	193.0	84
1,2,3,6,7,8-HxCDD-13C	100	74.7	25.0	163.0	75
1,2,3,4,6,7,8-HpCDF-13C	100	78.1	21.0	158.0	78
1,2,3,4,7,8,9-HpCDF-13C	100	79.8	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	89.1	26.0	166.0	89
OCDD-13C	200	194.0	26.0	397.0	97

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....1015282

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

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

Pace Analytical™

Method 1613B Laboratory Control Spike Results

Client - North Creek Analytical

Lab Sample ID	LCSD-7478		
Filename	U50706A_13	Matrix	Water
Total Amount Extracted	993 mL	Dilution	NA
ICAL Date	07/06/2005	Extracted	06/30/2005
CCal Filename	U50706A_10	Analyzed	07/06/2005 18:35
Method Blank ID	BLANK-7476	Injected By	SMT

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	11.4	7.5	15.8	114
2,3,7,8-TCDD	10	10.0	6.7	15.8	100
1,2,3,7,8-PeCDF	50	56.0	40.0	67.0	112
2,3,4,7,8-PeCDF	50	53.4	34.0	80.0	107
1,2,3,7,8-PeCDD	50	47.3	35.0	71.0	95
1,2,3,4,7,8-HxCDF	50	48.7	36.0	67.0	97
1,2,3,6,7,8-HxCDF	50	53.0	42.0	65.0	106
2,3,4,6,7,8-HxCDF	50	53.4	35.0	78.0	107
1,2,3,7,8,9-HxCDF	50	53.1	39.0	65.0	106
1,2,3,4,7,8-HxCDD	50	55.9	35.0	82.0	112
1,2,3,6,7,8-HxCDD	50	58.2	38.0	67.0	116
1,2,3,7,8,9-HxCDD	50	57.4	32.0	81.0	115
1,2,3,4,6,7,8-HpCDF	50	58.2	41.0	61.0	116
1,2,3,4,7,8,9-HpCDF	50	59.0	39.0	69.0	118
1,2,3,4,6,7,8-HpCDD	50	50.5	35.0	70.0	101
OCDF	100	102.4	63.0	170.0	102
OCDD	100	94.7	78.0	144.0	95
2,3,7,8-TCDD-37Cl4	10	8.4	3.1	19.1	84
2,3,7,8-TCDF-13C	100	43.6	22.0	152.0	44
2,3,7,8-TCDD-13C	100	47.5	20.0	175.0	47
1,2,3,7,8-PeCDF-13C	100	59.1	21.0	192.0	59
2,3,4,7,8-PeCDF-13C	100	69.2	13.0	328.0	69
1,2,3,7,8-PeCDD-13C	100	76.0	21.0	227.0	76
1,2,3,4,7,8-HxCDF-13C	100	86.1	19.0	202.0	86
1,2,3,6,7,8-HxCDF-13C	100	82.5	21.0	159.0	83
2,3,4,6,7,8-HxCDF-13C	100	86.2	22.0	176.0	86
1,2,3,7,8,9-HxCDF-13C	100	85.0	17.0	205.0	85
1,2,3,4,7,8-HxCDD-13C	100	81.9	21.0	193.0	82
1,2,3,6,7,8-HxCDD-13C	100	75.6	25.0	163.0	76
1,2,3,4,6,7,8-HpCDF-13C	100	77.9	21.0	158.0	78
1,2,3,4,7,8,9-HpCDF-13C	100	80.1	20.0	186.0	80
1,2,3,4,6,7,8-HpCDD-13C	100	87.4	26.0	166.0	87
OCDD-13C	200	195.2	26.0	397.0	98

Cs = Concentration Spiked (ng/mL)
Cr = Concentration Recovered (ng/mL)
Rec. = Recovery (Expressed as Percent)
Control Limit Reference: Method 1613, Table 6, 10/94 Revision
X = Background subtracted value
P = Recovery outside of control limits
Nn = Value obtained from additional analysis
* = See Discussion

Report No.....1015282

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414
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Fax: 612.607.6444

SPIKE RECOVERY RELATIVE PERCENT DIFFERENCE (RPD) RESULTS

Client..... North Creek Analytical

SPIKE 1 ID..... LCS-7477
SPIKE 1 Filename..... U50706A_12
SPIKE 2 ID..... LCSD-7478
SPIKE 2 Filename..... U50706A_13

COMPOUND	SPIKE 1 REC,%	SPIKE 2 REC,%	RPD,%
2378-TCDF	114	114	0.0
2378-TCDD	102	100	2.0
12378-PeCDF	112	112	0.0
23478-PeCDF	105	107	1.9
12378-PeCDD	94	95	1.1
123478-HxCDF	95	97	2.1
123678-HxCDF	108	106	1.9
234678-HxCDF	101	107	5.8
123789-HxCDF	99	106	6.8
123478-HxCDD	106	112	5.5
123678-HxCDD	114	116	1.7
123789-HxCDD	109	115	5.4
1234678-HpCDF	114	116	1.7
1234789-HpCDF	118	118	0.0
1234678-HpCDD	98	101	3.0
OCDF	101	102	1.0
OCDD	96	95	1.0

REC = Percent Recovered
RPD = The difference between the two values divided by the average.
NA = Not Applicable

Report No..... 1015282

REPORT OF LABORATORY ANALYSIS

nelac

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City of Portland Water Pollution Laboratory	Project Name:	**Main - 40567**	
6543 N. Burlington Ave.	Project Number:	Project name on COC	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	07/14/05 15:32

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
F0050657	P5F0859-01	Water	06/21/05 09:28	06/21/05 10:55

PORTLAND HARBOR INLINE

6/21/05

CHROMIUM VI

NEED - DIOXINS / FURANS

Hg EPA 1631 - CANCELLED

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

Project Name: **Main - 40567**
Project Number: Project name on COC
Project Manager: Jennifer Shackelford

Report Created:
07/14/05 15:32

Hexavalent Chromium per EPA Method 7195

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P5F0859-01 Water	**F0050657**	**Sampled: 06/21/05 09:28**								
Hexavalent Chromium	EPA 7195	ND	-----	0.0100	mg/l	10x	5060935	06/21/05	07/14/05 06:35	**M-01**

North Creek Analytical - Portland

Howard B. Holmes

Howard Holmes, Project Manager

www.ncalabs.com

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

Project Name: **Main - 40567**
Project Number: Project name on COC
Project Manager: Jennifer Shackelford

Report Created:
07/14/05 15:32

Hexavalent Chromium per EPA Method 7195 - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 5060935 **Water Preparation Method: EPA 7195**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (5060935-BLK1)								**Extracted: 06/21/05 15:28**						
Hexavalent Chromium	EPA 7195	ND	---	0.0100	mg/l	10x	--	--	--	--	--	--	07/14/05 06:02	M-01
LCS (5060935-BS1)								**Extracted: 06/21/05 15:28**						
Hexavalent Chromium	EPA 7195	0.942	---	0.0100	mg/l	10x	--	1.00	94.2%	(85-115)	--	--	07/14/05 06:08	M-01
LCS Dup (5060935-BSD1)								**Extracted: 06/21/05 15:28**						
Hexavalent Chromium	EPA 7195	0.949	---	0.0100	mg/l	10x	--	1.00	94.9%	(85-115)	0.740%	(20)	07/14/05 06:28	M-01
Duplicate (5060935-DUP1)				**QC Source: P5F0859-01**				**Extracted: 06/21/05 15:28**						
Hexavalent Chromium	EPA 7195	ND	---	0.0100	mg/l	10x	ND	--	--	--	NR	(20)	07/14/05 06:42	M-01
Matrix Spike (5060935-MS1)				**QC Source: P5F0859-01**				**Extracted: 06/21/05 15:28**						
Hexavalent Chromium	EPA 7195	1.14	---	0.0100	mg/l	10x	ND	1.00	114%	(80-120)	--	--	07/14/05 06:48	M-01

North Creek Analytical - Portland

Howard B. Holmes

Howard Holmes, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

North Creek Analytical, Inc.
Environmental Laboratory Network

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City of Portland Water Pollution Laboratory	Project Name:	**Main - 40567**	
6543 N. Burlington Ave.	Project Number:	Project name on COC	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	07/14/05 15:32

Notes and Definitions

Report Specific Notes:

M-01 - Analysis performed by EPA 200.8/6020 due to matrix interference or to meet lower reporting limit.

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. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

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.

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2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: P5F0859

NCA CLIENT: CITY OF PORTLAND

REPORT TO: Jennifer Shackelford

ADDRESS:

PHONE: FAX:

INVOICE TO:

P.O. NUMBER: 40567

PROJECT NAME: Portland Harbor Inline

PROJECT NUMBER:

SAMPLED BY:

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: [X] STD. [7] [5] [4] [3] [2] [1] [<1]

Petroleum Hydrocarbon Analyses: [X] STD. [4] [3] [2] [1] [<1]

[OTHER] Specify:

* Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE	REQUESTED ANALYSES: Chromium VI	Dioxins Furans HRMS 1613	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1 F0050657	6/21/05 0928		X	X	W	2		
2								
3								
4								
5								
6								
7								
8								
9								
10								

RELEASED BY: Jennifer Shackelford DATE: 6/21/05

PRINT NAME: Jennifer Shackelford FIRM: COP TIME: 1055

RECEIVED BY: Vanessa Brown DATE: 6-21-05

PRINT NAME: Vanessa Brown FIRM: NCA TIME: 10:55

RELEASED BY: DATE:

PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:

PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

cc client

TEMP: 16.3

COC REV 09/04

PAGE OF

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June 30, 2005

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 06/22/05 14:30.
The following list is a summary of the NCA Work Orders contained in this report.
If you have any questions concerning this report, please feel free to contact me.

Work	Project	ProjectNumber
P5F0947	Portland Harbor	40567

Thank You,

Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	40567	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	06/30/05 21:36

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
F0050657	P5F0947-01	Water	06/21/05 09:28	06/22/05 14:30

North Creek Analytical - Portland

Howard Holmes, Project Manager

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

Project Name: **Portland Harbor**
Project Number: 40567
Project Manager: Jennifer Shackelford

Report Created:
06/30/05 21:36

Chlorinated Herbicides per EPA Method 8151A Modified

North Creek Analytical - Portland

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
P5F0947-01 Water	**F0050657**	**Sampled: 06/21/05 09:28**								
2,4-D	8151mod	ND	-----	1.00	ug/l	1x	5061151	06/27/05	06/28/05 23:25	**J-06**
2,4-DB	"	ND	-----	1.00	"	"	"	"	"	**J-06**
2,4,5-T	"	ND	-----	1.00	"	"	"	"	"	
2,4,5-TP (Silvex)	"	ND	-----	1.00	"	"	"	"	"	
Dalapon	"	ND	-----	5.00	"	"	"	"	"	**J-06**
Dicamba	"	ND	-----	1.00	"	"	"	"	"	
Dichlorprop	"	ND	-----	1.00	"	"	"	"	"	
Dinoseb	"	ND	-----	1.00	"	"	"	"	"	**J-06**
MCPA	"	ND	-----	300	"	"	"	"	"	
MCPP	"	ND	-----	300	"	"	"	"	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid		*Recovery: 93.2%*		*Limits: 20 - 150 %*	"				"	

North Creek Analytical - Portland

Howard Holmes, Project Manager

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

Project Name: **Portland Harbor**
Project Number: 40567
Project Manager: Jennifer Shackelford

Report Created:
06/30/05 21:36

Chlorinated Herbicides per EPA Method 8151A Modified - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 5061151 **Water Preparation Method: EPA 3510/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Blank (5061151-BLK1)							**Extracted: 06/27/05 10:46**							
2,4-D	8151mod	ND	---	1.00	ug/l	1x	--	--	--	--	--	--	06/28/05 22:04	
2,4-DB	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	J-06
2,4,5-T	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
2,4,5-TP (Silvex)	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Dalapon	"	ND	---	5.00	"	"	--	--	--	--	--	--	"	
Dicamba	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Dichlorprop	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	
Dinoseb	"	ND	---	1.00	"	"	--	--	--	--	--	--	"	J-06
MCPA	"	ND	---	300	"	"	--	--	--	--	--	--	"	
MCPP	"	ND	---	300	"	"	--	--	--	--	--	--	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid		*Recovery: 92.8%*		*Limits: 20-150%*		"							*06/28/05 22:04*	
LCS (5061151-BS1)							**Extracted: 06/27/05 10:46**							
2,4-D	8151mod	21.3	---	1.00	ug/l	1x	--	20.0	106%	(40-160)	--	--	06/28/05 22:58	J-06, Q-28
2,4-DB	"	24.0	---	1.00	"	"	--	"	120%	"	--	--	"	J-06, Q-28
2,4,5-T	"	23.8	---	1.00	"	"	--	"	119%	"	--	--	"	
2,4,5-TP (Silvex)	"	17.5	---	1.00	"	"	--	"	87.5%	"	--	--	"	
Dalapon	"	19.0	---	5.00	"	"	--	"	95.0%	"	--	--	"	J-06, Q-28
Dicamba	"	21.3	---	1.00	"	"	--	"	106%	"	--	--	"	
Dichlorprop	"	19.1	---	1.00	"	"	--	"	95.5%	"	--	--	"	
Dinoseb	"	32.3	---	1.00	"	"	--	"	162%	"	--	--	"	J-06, Q-28, Q-29
MCPA	"	1840	---	300	"	"	--	2000	92.0%	"	--	--	"	
MCPP	"	1960	---	300	"	"	--	"	98.0%	"	--	--	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid		*Recovery: 93.6%*		*Limits: 40-160%*		"							*06/28/05 22:58*	
Matrix Spike (5061151-MS1)							**QC Source: P5F0947-01**						**Extracted: 06/27/05 10:46**	
2,4-D	8151mod	ND	---	1.00	ug/l	1x	0.527	20.0	NR	(40-160)	--	--	06/28/05 23:53	J-06, Q-28
2,4-DB	"	25.3	---	1.00	"	"	0.582	"	124%	"	--	--	"	J-06, Q-28
2,4,5-T	"	23.6	---	1.00	"	"	0.372	"	116%	"	--	--	"	
2,4,5-TP (Silvex)	"	17.8	---	1.00	"	"	0.443	"	86.8%	"	--	--	"	
Dalapon	"	19.7	---	5.00	"	"	ND	"	98.5%	"	--	--	"	J-06, Q-28
Dicamba	"	22.0	---	1.00	"	"	ND	"	110%	"	--	--	"	
Dichlorprop	"	19.6	---	1.00	"	"	ND	"	98.0%	"	--	--	"	
Dinoseb	"	32.1	---	1.00	"	"	0.368	"	159%	"	--	--	"	J-06, Q-28
MCPA	"	1940	---	300	"	"	ND	2000	97.0%	"	--	--	"	
MCPP	"	2090	---	300	"	"	ND	"	104%	"	--	--	"	
Surrogate(s): 2,4-Dichlorophenylacetic acid		*Recovery: 90.4%*		*Limits: 40-160%*		"							*06/28/05 23:53*	

North Creek Analytical - Portland

Howard Holmes, Project Manager

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North Creek Analytical, Inc.
Environmental Laboratory Network

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

Project Name: **Portland Harbor**
Project Number: 40567
Project Manager: Jennifer Shackelford

Report Created:
06/30/05 21:36

Chlorinated Herbicides per EPA Method 8151A Modified - Laboratory Quality Control Results

North Creek Analytical - Portland

QC Batch: 5061151 **Water Preparation Method: EPA 3510/600 Series**

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike Dup (5061151-MSD1)					**QC Source: P5F0947-01**					**Extracted: 06/27/05 10:46**				
2,4-D	8151mod	21.7	---	1.00	ug/l	1x	0.527	20.0	106%	(40-160)		(40)	06/29/05 00:20	J-06, Q-28
2,4-DB	"	25.6	---	1.00	"	"	0.582	"	125%	"	1.18%	"	"	J-06, Q-28
2,4,5-T	"	23.8	---	1.00	"	"	0.372	"	117%	"	0.844%	"	"	
2,4,5-TP (Silvex)	"	18.0	---	1.00	"	"	0.443	"	87.8%	"	1.12%	"	"	
Dalapon	"	19.7	---	5.00	"	"	ND	"	98.5%	"	0.00%	"	"	J-06, Q-28
Dicamba	"	22.7	---	1.00	"	"	ND	"	114%	"	3.13%	"	"	
Dichlorprop	"	19.6	---	1.00	"	"	ND	"	98.0%	"	0.00%	"	"	
Dinoseb	"	31.5	---	1.00	"	"	0.368	"	156%	"	1.89%	"	"	J-06, Q-28
MCPA	"	1980	---	300	"	"	ND	2000	99.0%	"	2.04%	"	"	
MCPP	"	2150	---	300	"	"	ND	"	108%	"	2.83%	"	"	

Surrogate(s): 2,4-Dichlorophenylacetic acid Recovery: 94.8% Limits: 40-160% " 06/29/05 00:20

North Creek Analytical - Portland

Howard Holmes, Project Manager

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City of Portland Water Pollution Laboratory	Project Name:	**Portland Harbor**	
6543 N. Burlington Ave.	Project Number:	40567	Report Created:
Portland, OR 97203	Project Manager:	Jennifer Shackelford	06/30/05 21:36

Notes and Definitions

Report Specific Notes:

J-06 - Daily Calibration Check Sample had recovery above 115% for this analyte. Result may be biased high. All samples were Non-Detect, Data Quality is not impacted.

Q-28 - The recovery for the Daily Continuing Calibration Check sample was above method specified criteria. All samples were Non Detect for this analyte, therefore Data Quality is not affected. Reported results for QC may be biased high.

Q-29 - The recovery for the Laboratory Control Sample, and/or LCS Duplicate, for this analyte was above method specified criteria. All samples were Non Detect for this analyte, therefore Data Quality is not affected.

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. Reporting Limits are corrected for %Solids when %Solids are <50%.

wet - Sample results and reporting limits reported on a wet weight basis (as received).

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.

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CHAIN OF CUSTODY REPORT

Work Order #: 5FC947

NCA CLIENT: City of Portland

REPORT TO: Jennifer Shackelford

ADDRESS:

PHONE: FAX:

INVOICE TO: Charles Lytle

P.O. NUMBER: 40567

PROJECT NAME: Portland Harbor

PROJECT NUMBER:

SAMPLED BY:

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: ☒ 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

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	Pests/PCBs 8081/8082	Herbs EPA 8151	PCBs 8082 Low Level	MATRIX (W, S, O)	# OF CONT.	LOCATION / COMMENTS	NCA WO ID
1	F0050657	6/21/05 0928	X	X		W	2		
2	674	1350			X	S	2		
3	675	1000	X			S	2		
4	676	1020	X			S	2		
5	677	1038	X			S	2		
6									
7									
8									
9									
10									

RELEASED BY: Maggie Faraguna DATE: 6/22/05

PRINT NAME: Maggie Faraguna FIRM: City of Portland TIME: 1:30

RECEIVED BY: Bob DATE: 6/22/05

PRINT NAME: Bob FIRM: NCA TIME:

RELEASED BY: Bob DATE: 6/22/05

PRINT NAME: Bob FIRM: NCA TIME: 14:30

RECEIVED BY: Callie Fujishige DATE: 6/22/05

PRINT NAME: Callie Fujishige FIRM: NCA TIME: 1430

ADDITIONAL REMARKS: Water Pests/PCBs are sent to GERG for analysis. Soil Pests/PCBs and PCBs are sent to STL-Seattle for analysis. Only water Herbs are to be analyzed at NCA.

TEMP: 10

COC REV 09/04

NORTH CREEK ANALYTICAL COOLER RECEIPT FORM

(Army Corp. compliant)

Client: CCP

1. **Please sign for receipt and opening of** 1 **cooler or** _____ **other** _____

   By (print) Chris Fahsholz (sign) [signature]

2. Date samples received 6/22/05 Date opened: Same X or ___/___/___

3. Delivered by: ✓ NCA (BOB) courier ___ FedEx ___UPS ___Courier ___Client ___Other_____

   Airbill # if applicable _____ (Put copy of shipping papers in file)

4. There were 1 custody seals present, signed by BOB date 6/22/05.

5. Were the custody seals unbroken and intact at the date and time of arrival? X Yes ___No

6. Was ice used? X yes ___no Type of ice: ___ blue ice ___gel ice X real ice

   Temperature (degrees C) _____ Raytek thermometer 1.0 Digi-Therm (probe temperature blank)

7. Are custody papers sealed in a plastic bag and taped inside to lid? ___Yes X No

8. Were custody papers filled out properly (ink, signed, etc.)? X Yes ___No

   If "no" please specify: _____

9. Was project identifiable from custody papers? X Yes ___No

   Name of project Portland Harbor (if applicable)

10. **Initial and date for unpacking:** EJ **(initials)** **date** 6/22/05

11. Packing material: NA bubble wrap/bag ___styrofoam ___cardboard _____other

12. Were samples in bags? ___Yes X No

13. Did all containers indicated on the COC arrive? ✓ Yes ___No

    If "no" please indicate which containers were absent _____

14. Were all containers unbroken and labels in good condition? ✓ Yes ___No

    If "no" please indicate which containers _____

15. Were all bottle labels complete (ID, date, time, signature, etc.)? ✓ Yes (✓ EJ) No

    Do the IDs, times, etc. agree with the COC? ✓ Yes ___No

    If "no" please indicate which containers no time/date on labels

16. Are containers properly preserved for indicated analysis? ✓ Yes ___No

17. Is there adequate volume for the test(s) requested? ✓ Yes ___No

18. If voa vials were submitted, are they free of bubbles? ✓ N/A ___Yes ___No

19. **Log-in phase: Date samples were logged in:** 6/22/05 **Elm Project #** P5F0947

20. Logged in by (print) Emily Jensen (sign) [signature]

21. Was the project manager notified of status? (Use back of form as a record) ___Yes ✓ No