

Intergovernmental
Agreement for
Remedial
Investigation and
Source Control
Measures

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Outfall Basin S-1 Source Investigation

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Technical Memorandum No. OF S1-1

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June 2012

PREPARED BY



ENVIRONMENTAL SERVICES
CITY OF PORTLAND
working for clean rivers



TECHNICAL MEMORANDUM No. OFS1-1

Outfall Basin S-1 Source Investigation

TO: Alex Liverman, Oregon Department of Environmental Quality (DEQ)

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

COPIES: David Lacey, DEQ
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Julia Fowler, GSI Water Solutions, Inc.

DATE: June 14, 2012

SUBJECT: **Portland Harbor Source Investigation**

Introduction

This technical memorandum presents the results of the City of Portland (City) source investigation activities conducted in 2010 and 2011 in Outfall Basin S-1. The investigation results identified sources of organotins, polycyclic aromatic hydrocarbons (PAHs), metals, polychlorinated biphenyls (PCBs) and bis(2-ethylhexyl)phthalate (BEHP) to the Basin S-1 municipal storm system.

Outfall S-1 drains a 25-acre basin that includes portions of the Swan Island Portland Shipyard (Shipyard)¹ and two other industrial properties. The investigation objectives were: 1) to determine potential pathways by which identified Shipyard contaminants such as organotins are entering the City conveyance system; and 2) to trace sources of other contaminants present at elevated concentrations in Outfall S-1 stormwater screening samples (i.e., PAHs and copper) (BES, 2010a). The investigation:

- Confirmed that organotins and other contaminants are being discharged from the Shipyard to Basin S-1 via a piped stormwater connection;
- Detected organotins in catch basins along the adjacent N. Lagoon Avenue, suggesting that offsite migration of Shipyard contaminants is occurring via other pathways (e.g. vehicle drag-out, air deposition);
- Identified a major source of PAHs to the City conveyance system: the EWH LLC (EWH) site; and
- Determined that all three industrial sites within the basin are sources of copper to Basin S-1.

¹ The Swan Island Portland Shipyard is currently owned by the Port of Portland and operated by Vigor Industrial, LLC.

Elevated concentrations of organotins, metals, PAHs, PCBs, and BEHP in Basin S-1 source investigation samples indicate the need for source control measures at the Shipyard and EWH sites.

This investigation is part of the City's ongoing Remedial Investigation associated with the Portland Harbor City of Portland Outfalls Project being conducted pursuant to the August 13, 2003, Intergovernmental Agreement (IGA) between DEQ and the City. Data collected under this investigation support ongoing DEQ and City efforts to identify, characterize and control discharges to the Basin S-1 municipal storm system.

Background

Basin Physical System and Setting

Outfall S-1, a 36-inch outfall pipe, drains a 25-acre stormwater-only basin that discharges to the Swan Island Lagoon on the east side of the Willamette River at approximately river mile 8.7. Current land use in the basin is industrial. The Basin S-1 stormwater conveyance system has two major branches that connect at manhole AAM131. The "west branch" receives stormwater from approximately 10 acres of the Shipyard site and the western half of the EWH site. The east branch receives stormwater from the eastern half of the EWH site and the western half of property owned and operated by DSU Peterbilt & GMC, Inc. The Outfall Basin S-1 stormwater conveyance system and basin boundary are shown on Figure 1.

Source Tracing Contaminants

The Swan Island Lagoon is within an area of the Portland Harbor identified by the U.S. Environmental Protection Agency (EPA) as an area of potential concern (AOPC 17S) based on elevated concentrations of PCBs, metals, tributyltin (TBT), PAHs, dibutylphthalate, benzyl alcohol, phenol, and pesticides (EPA, 2010). In addition to Outfall S-1, four other City outfalls and more than 50 non-City outfalls also drain to AOPC 17S.

As part of its Portland Harbor stormwater screening effort, the City collected stormwater grab samples during four storm events in 2007 at a Basin S-1 location representing cumulative discharge from the entire basin (manhole AAM131; see Figure 1). The stormwater samples were analyzed for a broad suite of chemicals to identify stormwater contaminants potentially warranting further source tracing in the basin. The stormwater sampling activities and results are described in detail in the City's *Stormwater Evaluation Report* (BES, 2010a). Based on statistical analyses of the Basin S-1 stormwater results in relation to harborwide stormwater data, the City determined that total PAHs and copper potentially warranted further source tracing within the basin.

For the purposes of this investigation, the City included additional source tracing contaminants to fill existing data gaps in the Shipyard's characterization of stormwater discharges to Basin S-1. Based on the identified presence of organotins at the Shipyard, the City analyzed stormwater and stormwater solids samples for organotins to determine possible migration pathways to S-1 for Shipyard contaminants (ERM, 2008). The analytical suite for stormwater samples was also expanded to include PCBs, zinc, and BEHP following a review of Shipyard stormwater pathway data (ERM, 2010).

Potential Upland Sources

Upland facilities identified as potential sources to City stormwater conveyance systems include DEQ Cleanup Program sites, as listed in DEQ's Environmental Cleanup Site Information (ECSI) database, and facilities permitted by DEQ under the National Pollutant Discharge Elimination System (NPDES) industrial stormwater discharge program. Of the three industrial facilities in Basin S-1, the Shipyard and EWH sites both are currently conducting DEQ Cleanup Program evaluations and are covered by NPDES stormwater permits. The third facility, DSU - Peterbuilt & GMC, Inc. (DSU), is not a DEQ cleanup site or permitted under the NPDES industrial stormwater program but also was evaluated as a potential source to the City conveyance system. These facilities are described below and shown on Figure 1.

- Swan Island Portland Ship Yard*² (ECSI No. 271): This site has been a shipyard since the 1940s. Current operations at the site include ship repair, industrial blasting and coating, metals fabrication, oil and wastewater treatment, vessel layup, and barge building (ERM, 2010). A stormwater pathway evaluation is currently underway at the Shipyard site under DEQ's Cleanup program, including evaluation of the site's stormwater discharges to the Basin S-1 conveyance system (DEQ, 2005). Results from the limited sampling of catch basin solids, stormwater, and suspended sediment conducted as part of the stormwater pathway evaluation indicate this site is an uncontrolled source of TBT, metals, phthalates, PCBs, and PAHs to the Basin S-1 conveyance system (ERM, 2008, 2010, 2011; DEQ, 2012a). In stormwater sediments, including catch basins and inline traps, concentrations of TBT, certain metals (arsenic, copper, lead, mercury, silver, zinc), PAHs and PCBs are among the highest levels observed at Portland Harbor industrial sites. Concentrations of PAHs and metals (cadmium, copper and zinc) in stormwater also are among the highest for Portland Harbor industrial sites. Based on these results, DEQ has concluded that source control measures are needed across the Shipyard (DEQ, 2012a).

The Shipyard site has an NPDES 1200-Z industrial stormwater discharge permit, issued to Vigor Industrial, LLC. Copper and zinc concentrations in stormwater discharges from the site have exceeded the NPDES permit benchmarks.

- EWH, LLC* (ECSI No. 5685): Historical operations at the EWH site, located at 5555 N. Channel Avenue/5851 N. Lagoon Avenue, are believed to include activities associated with shipbuilding and metal fabrication. The site is owned by EWH, LLC and is leased and operated by Service Steel Inc., Evans Metal Fabricators, Swan Island Sandblast, Tice Electric Company, and EFI Secure Shredding-Recycling (EWH, 2012). The main operations at the site are metal fabrication. In 2011, the City requested a DEQ Site Assessment review of this property based on initial results of stormwater samples collected as part of this investigation from the lateral connecting the site to Basin S-1 (BES, 2011b). DEQ subsequently added this site to the ECSI database in 2012 as a suspect site requiring further investigation and is in the process of negotiating a Cleanup Program agreement (DEQ, 2012b).

The EWH site recently obtained an NPDES 1200-Z industrial stormwater discharge permit, and benchmark exceedances for zinc have occurred.

- DSU - Peterbilt & GMC, Inc.*: The western portion of DSU's facility at 5555 N. Lagoon Avenue discharges to Basin S-1. Operations at this facility include repair, service and

² The Shipyard site is also known as Vigor Industrial, Cascade General, and Port of Portland – Ship Repair Yard (DEQ, 2005).

maintenance of heavy-duty, medium-duty and light-duty vehicles and sale of vehicle parts (DSU, 2008a). Operations at the facility are not required to be permitted under the NPDES industrial stormwater program, but a past site inspection by the City's Industrial Stormwater Program indicated the presence of prohibited stormwater discharges from the site as a result of oil stained pavement in exposed areas (BES, 2008a). The site subsequently implemented measures to eliminate these exposures (DSU, 2008b).

Stormwater Solids Investigation

Field Activities

The City's stormwater solids investigation in Basin S-1 included sediment trap sampling and catch basin sampling in 2010. Stormwater solids sample locations are summarized below and shown on Figure 1.

Sample Location	Description	Sample Type
Manhole AAM127	Upstream of manhole in the 21-inch-diameter main stormwater line (entering from the northwest). Represents piped Shipyard discharges to the basin.	Sediment trap
Catch basins ANE512 and ANE509	Catch basins on southwest side of N. Lagoon Avenue. Represents N. Lagoon inlets closest to exit from Shipyard to N. Lagoon Ave.	Composite of both catch basins
Catch basins ANE503 and ANE507	Catch basins on southwest side of N. Lagoon Avenue. ROW. Represents N. Lagoon inlets downgradient from Shipyard and EWH exits to N. Lagoon Ave.	Composite of both catch basins

The sediment trap investigation was completed in accordance with the applicable Standard Operating Procedures included in the City's Amended Programmatic Sampling and Analysis Plan (Programmatic SAP) for collection of water and solids samples for the City of Portland Outfalls Project (BES, 2007b). A Screened Inline Flow-Through (SIFT®)³ sediment trap was installed in the incoming 21-inch line in manhole AAM127 on February 19, 2010. This line receives stormwater discharges only from the Shipyard site; the trap was deployed to evaluate if organotins were being discharged to the Basin S-1 conveyance system.

The sediment trap was inspected periodically to assess the volume of trapped solids, note general conditions, and remove any debris that might be obstructing the opening of the trap chamber. Accumulated solids were removed as needed during the field inspections and archived. The sediment trap was removed on June 15, 2010. Following collection of the last subsample, the subsamples were combined and thoroughly homogenized for laboratory analyses. The final homogenized sediment trap sample was submitted for laboratory analysis of organotins, total solids (TS) and total organic carbon (TOC). Photographs of the sediment trap in the installed location, sample collection, and sample processing are provided in Attachment A. Field notes recorded during sediment trap installation, monitoring, removal, and processing activities are provided in Attachment B.

³ 2009 City of Portland. These traps are proprietary and patent pending. They were designed by the City for use in smaller pipe diameters and low-flow depth conditions.

The sediment trap investigation confirmed that the Shipyard is discharging organotins to Basin S-1. Based on these results (discussed below), the City conducted another phase of the source investigation by collecting stormwater solids samples from catch basins located along N. Lagoon Avenue. Field activities were completed on September 16, 2010, in general accordance with the *Summer 2010 Sampling and Analysis Plan* (Summer 2010 SAP; BES, 2010c). The purpose of the catch basin investigation was to evaluate whether pathways such as vehicle tracking and air deposition may have resulted in offsite migration of organotins from the Shipyard and EWH sites into catch basins on the southwest side of N. Lagoon Avenue. The investigation targeted catch basins on the southwest side of N. Lagoon Avenue because traffic leaving these sites likely utilizes this lane to travel away from the sites.

Solids from the four catch basin sampling locations were combined and homogenized to create the two composite samples. The final homogenized samples were submitted for laboratory analysis of organotins, TS, and TOC. Selected photographs of the catch basin sampling activities are provided in Attachment A. Field notes are included in Attachment B.

Summary of Results

Table 1 summarizes the laboratory analytical results for the sediment trap and catch basin composite samples. The Joint Source Control Strategy (JSCS; DEQ/EPA 2005, updated in July 2007) screening level value (SLV) for TBT is provided in Table 1 for reference. The JSCS does not establish SLVs for other organotins. Organotin concentrations for the three solids samples also are shown on Figure 2. The laboratory analytical reports and data review memoranda for the sediment trap and catch basin samples are provided in Attachment C.

TBT was detected in the sediment trap sample at a concentration exceeding the JSCS SLV by more than two orders-of-magnitude. Lower concentrations of dibutyltin and monobutyltin also were detected in the sample; tetra-n-butyltin was not detected. The same three organotins were detected in the catch basin composite samples, and TBT concentrations in these samples also exceed the SLV. As shown on Table 1 and Figure 2, these organotins also have been detected in stormwater solids from the Shipyard (ERM, 2008 and 2011). The solids data from the City conveyance system and from the Shipyard, together with the stormwater data discussed below, are evaluated in the “Data Evaluation” section.

Stormwater Investigation

Field Activities

Stormwater sampling in Basin S-1 was conducted in general accordance with the Winter 2010-11 SAP (BES, 2010d), amended as discussed with DEQ in December 2010.⁴ The purpose of this investigation was to evaluate sources of the contaminants (PAHs and copper) identified for source tracing based on the City’s 2007 stormwater sampling in the basin (BES, 2010a). In addition to PAHs and copper, the samples also were analyzed for zinc, PCB Aroclors and phthalates based on a review of data gaps affiliated with the Shipyard characterization of stormwater discharges to Basin S-1. The City initially planned to collect stormwater samples from Basin S-1 during three storm events. Because sampling locations were modified after the first two storm events, as discussed below, the City collected samples during a total of five storm events.

⁴ Changes discussed in emails between K. Tarnow (DEQ) and L. Scheffler (BES). December 9 – 20, 2010.

Sampling Locations

The stormwater sampling locations were selected to characterize discharges from identified and suspected sources to the City conveyance system. Locations included lateral connections from the three industrial sites in the basin. After the first two stormwater sampling events were completed, it was discovered that samples from two of the manholes (AAM127 and AAM133) had mistakenly been collected in the outgoing lines instead of the intended incoming lines. The sampling locations were corrected and an additional sampling location (SW6, at manhole AAM138) was added for the final three sampling events. The Basin S-1 stormwater sampling locations are summarized below and shown on Figure 1.

Location	Description	Storm Events Sampled
Manhole AAM131 (SW1)	Downstream of manhole in 36-inch line. Represents cumulative (whole basin) discharges from Basin S-1.	1 – 5
Manhole AAM127 (SW2)	Downstream of manhole in 27-inch line. Represents discharges from the Shipyard, a small portion of the EWH site, and a catch basin on the northeast side of N. Lagoon Avenue.	1, 2
Manhole AAM133 (SW3)	Downstream of manhole in 18-inch line. Represents discharges to the eastern branch.	1 – 5
Manhole AAM133 (SW4)	Upstream of manhole in 15-inch lateral from the EWH LLC site. Represents discharges from the eastern portion of the EWH site.	3 – 5
Manhole AAM127 (SW5)	Upstream of manhole in the 21-inch-diameter main stormwater line (entering from the northwest). Represents discharges from the Shipyard.	3 – 5
Manhole AAM138 (SW6)	Upstream of manhole, in lateral from the DSU site. Represents discharges from DSU.	3 – 5

Selected photographs of the stormwater sampling locations and flow conditions at the time of sampling are included in Attachment A. Field notes recorded during stormwater sampling activities are included in Attachment B.

Storm Events Sampled

The Basin S-1 stormwater sampling targeted storm events meeting the following criteria (consistent with the JSCS):

- Antecedent dry period of at least 24 hours (as defined by <0.1 inch of rainfall over the previous 24 hours);
- Minimum predicted rainfall volume of >0.2 inch for the storm event; and
- Expected duration of the storm event of at least 3 hours.

Precipitation graphs for each event from data collected at the Swan Island rain gage⁵ are shown on Figure 3. Flow data at the sampling location were not collected as part of this investigation.

⁵ Station #204 in the City's Hydrological Data Retrieval and Alarm (HYDRA) system rain gage network (http://or.water.usgs.gov/non-usgs/bes/raingage_info/). Location is on Swan Island near Willamette River.

Brief descriptions of the storm events sampled are provided below, based on sampling crew field notes and the average hourly rainfall data shown on Figure 3. Figure 3 includes a summary of the characteristics of each sampling event and designates those events that are judged as meeting “first-flush” criteria based on the rain gage data, field observations, and the timing of sample collection during the storm event.

- *Event 1 – February 12, 2011:* Only a trace amount of rainfall (0.01 inches) was recorded at the Swan Island rain gage for the four days preceding this event. The minimum forecasted rainfall for this event was 0.58 inches. Steady rainfall began between 5:00 and 6:00 p.m., Pacific Standard Time (PST), and the samples were collected between 5:32 p.m. and 5:50 p.m. PST on February 12. Only 0 to 0.09 inches of rainfall had been recorded by the Swan Island rain gage at the time sampling began, but runoff conditions were observed by field staff at the time of sampling. A total of 0.54 inches was recorded by the time the storm event ended between 9:00 and 10:00 p.m. PST on February 12. The samples from this event are considered to reflect first-flush conditions.
- *Event 2 – March 23, 2011:* Less than 0.1 inch of precipitation was recorded at the Swan Island rain gage over the approximately 48 hours immediately preceding this event. The minimum forecasted rainfall for this event was 0.15 inches. Steady rainfall began between 7:00 and 8:00 p.m. PST⁶ on March 23 and the samples were collected between 8:45 and 9:16 p.m. PST. By the time of sampling, between 0.04 and 0.2 inches of rainfall had been recorded; a total of 0.21 inches was recorded by the time the event ended between 10:00 and 11:00 p.m. on March 23. The samples from this event are considered to reflect first-flush conditions.
- *Event 3 – April 14, 2011:* A total of 0.14 inches of intermittent rainfall was recorded at the Swan Island rain gage during the day preceding this event; however, less than 0.1 inches were recorded in the 12 hours prior to the event. The minimum forecasted rainfall for this event was 0.37 inches. Steady rainfall began between 1:00 and 2:00 a.m. PST on April 14 and became very heavy between 4:00 and 7:00 a.m. The samples were collected between 7:29 a.m. and 8:20 a.m. on April 14. By the time of sampling, approximately 0.47 inches of rainfall had been recorded at the rain gage. Rainfall became intermittent for a few hours immediately following sampling and then continued for a period of more than 24 hours of steady, periodically heavy, rainfall. Total rainfall for the storm was more than 2 inches. The samples from this event are not considered to reflect first-flush conditions.
- *Event 4 – April 28, 2011:* A total of 0.19 inches of rain was recorded during the day preceding this event; however, less than 0.1 inch was recorded during the 17 hours prior to this event. The minimum forecasted rainfall for this event was 0.18 inches. Rainfall began between 12:00 and 1:00 p.m. PST on April 28, and the samples were collected between 2:53 and 3:50 p.m. PST on April 28. Approximately 0.06 to 0.11 inches of rainfall had been recorded at the Swan Island rain gage by time of sampling. Rain continued intermittently until between 7:00 and 8:00 p.m. PST on April 28, by which time a total of 0.19 inches of precipitation had been recorded for the storm event. The samples from this event are considered to reflect first-flush conditions.

⁶ Sampling times have been converted from Pacific Daylight Time to PST to conform with the HYDRA rain gage network data.

- *Event 5 – May 11, 2011:* Only a trace of rainfall (less than 0.1 inch) was recorded during more than 72 hours preceding this event. The minimum forecasted rainfall for this event was 0.19 inches. Rainfall began between 12:00 and 1:00 p.m. PST on May 11, and the samples were collected between 4:35 and 5:26 p.m. PST on May 11. Approximately 0.2 to 0.27 inches of rainfall had been recorded at the Swan Island rain gage by the time of sampling. The rain event ended between 4:00 and 5:00 p.m. PST on May 11, and total rainfall for the event was 0.27 inches. The samples from this event are not considered to reflect first-flush conditions.

Based on these sampling conditions, the 2011 stormwater samples are considered to meet the Basin S-1 sampling objective of investigating contaminant discharges during a variety of storm conditions.

Summary of Results

The stormwater samples were analyzed for PCB Aroclors, PAHs, phthalates, selected metals (copper and zinc), TOC, and total suspended solids (TSS). PAHs, phthalates, copper and zinc were detected in all of the stormwater samples. PCBs were detected only at the manhole AAM133 locations (SW3 and SW4). The laboratory reports and data review memoranda are included in Appendix C. Table 2 summarizes the laboratory analytical results for the whole basin stormwater samples (SW1). Table 3 summarizes the results for the west and east branches. The total PAHs concentrations in the stormwater samples are displayed on Figure 4. Metals, total PCBs, and BEHP concentrations are displayed on Figure 5.

Data Evaluation

Stormwater Solids Investigation

Detections of organotins in the direct discharges from the Shipyard lateral (trapped solids) and in catch basin solids from N. Lagoon Avenue confirm that these identified Shipyard contaminants are being discharged to the Basin S-1 conveyance system. Because the N. Lagoon Avenue catch basins that were sampled capture runoff from the lane used by vehicle traffic exiting the Shipyard site gate, offsite migration via vehicle dragout may be the primary source of the observed organotins in these catch basin. This conceptual model is supported by the fact that organotins have been detected at significantly higher concentrations in stormwater solids in the Shipyard stormwater conveyance system (including catch basin solids collected in 2007 and sediment trap solids collected in 2011) than in the N. Lagoon Avenue catch basin samples (see Table 1). In particular, TBT has been detected in the Shipyard samples at concentrations up to 350,000 µg/Kg (ERM, 2008).

Of the two catch basin composite samples from N. Lagoon Avenue, the higher organotin concentrations were in the sample that was collected from catch basins farther from the gate. However, significant differences in sample matrix make direct comparisons of concentrations between the samples problematic. The composite sample farther from the gate (ANE503 and ANE507) was composed predominantly of fine sediment (70% fine sediment), whereas the composite sample from the two catch basins closer to the gate (ANE509 and ANE512) was composed predominantly (75%) of coarse organic material. Due to the orientation of catch basin ANE512 (see Attachment A, Photo 11), this sample may have had greater influence from soil and organic material eroding from the adjacent vegetated strip. These sample matrix differences likely explain the differences in concentrations between the two samples (i.e., TBT concentrations

are expected to be higher in the sample with a greater percentage of fines and less coarse organic material).⁷

It is also possible that organotins are present at the EWH site, due to suspected historical shipyard-related activities at the site.

Stormwater Investigation

The stormwater investigation was conducted to identify sources of PAHs and copper. To assess if the stormwater data indicate major sources to the stormwater pathway, the City evaluated the Basin S-1 source investigation data set by general comparison to JSCS SLVs and reference concentration ranges for Portland Harbor industrial sites provided in DEQ's *Stormwater Evaluation Guidance* (DEQ, 2010b).

PAHs

The highest total PAH concentrations among all the Basin S-1 sample locations were in the samples from the incoming EWH lateral at manhole AAM133 (SW4) (see Figure 4). Concentrations at this location were up to 10 times higher than the upper end of the industrial reference values compiled in DEQ's guidance. Total PAH concentrations were significantly elevated only in stormwater samples from locations that were downstream of the EWH lateral. These results indicate the EWH site is a major source of PAHs to the Basin S-1 conveyance system. PAHs also may be entering the Basin S-1 conveyance system via vehicle dragout of contaminants from known sources (i.e., Shipyard and EWH) to catch basins on N. Lagoon Avenue.

Copper

The lowest concentrations of copper were detected at the DSU lateral. Concentrations at the other locations within the basin were relatively consistent, within two orders-of-magnitude of the SLV, and typically at about one-third of the current NPDES 1200-Z benchmark concentration of 100 µg/L. Results indicate that all three industrial sites are sources of copper.

Other Constituents

The following additional constituents were detected above SLVs in stormwater samples from one or more of the Basin S-1 sample locations:

- **Zinc.** Zinc was detected above SLVs in stormwater from all three sites, though almost all concentrations were on the lower portion of the DEQ reference curve. Concentrations in the samples from the Shipyard and EWH laterals were higher than those collected from the DSU lateral.
- **PCBs.** PCBs (Aroclor 1260 only) were detected only in stormwater samples from the EWH lateral (SW4) and from the sampling location immediately downstream of this lateral (SW3), as shown on Figure 5. Total PCB concentrations in stormwater from EWH (maximum of 0.14 µg/L) are elevated relative to the SLV and DEQ industrial reference concentrations.

⁷ See sample descriptions in field notes (Attachment B).

- **BEHP.** BEHP concentrations were highest in samples collected from the EWH lateral (maximum of 5.1 µg/L), and concentrations in these samples are elevated relative to DEQ industrial reference concentrations. BEHP concentrations from other sample locations are not notably elevated.

Conclusions and Next Steps

City source investigations completed in 2010 and 2011 evaluated contaminant discharges from all three industrial sites within Basin S-1. Investigation results indicate that source control measures are warranted at the Shipyard and the EWH facilities to address offsite migration of site contaminants to the municipal stormwater conveyance system. Conclusions and next steps include the following:

- **Shipyard:** Evaluation of the stormwater solids data indicates the Shipyard is contributing TBT and other organotins to the City system via direct discharges from its lateral connection, and likely also through vehicle dragout of contaminated media onto N. Lagoon Avenue. The source(s) of TBT at the Shipyard has not been identified (ERM, 2011). The stormwater data collected by the City confirm that this site also is a source of copper and zinc to the City conveyance system. It is also possible (given the high PAH concentrations that have been documented on site) that the Shipyard is a source of PAHs to the City system via vehicle dragout onto N. Lagoon Avenue. To date, the Shipyard's stormwater pathway evaluation has not fully characterized site discharges to Basin S-1. The DEQ Cleanup Program is working with the site on the evaluation of potential source control measures that may address this data gap. The City will continue to coordinate with DEQ on the review of work plans and reports related to the stormwater pathway evaluations at the Shipyard site.

Industrial stormwater discharges from the Shipyard are also covered by an NPDES 1200-Z permit. New permit terms include provisions for controlling vehicle drag-out of site contaminants and lower benchmarks for copper and zinc. Ongoing permit oversight by the City Industrial Stormwater Program, will help to ensure that site Best Management Practices (BMP) are developed and implemented to meet permit objectives and reduce contaminant loading from the site to Basin S-1.

- **EWH:** The stormwater sampling results indicate the EWH site is the only major source of PAHs to Basin S-1 and the most likely source of the elevated total PAHs concentrations in the 2007 stormwater screening samples from Outfall S-1 (BES, 2010a). Metals (copper and zinc), PCBs, and BEHP also were detected at moderately elevated concentrations in multiple stormwater samples from the EWH lateral, indicating that onsite source investigation and control is needed. In 2011, the City requested DEQ Site Assessment review of this property to determine whether Cleanup Program involvement may be needed to address site contamination concerns (BES, 2011b). DEQ subsequently added this site to the ECSI database in 2012 as a suspect site requiring further investigation, and is in the process of finalizing a Cleanup Program agreement with the site.

In August 2011, an NPDES 1200-Z permit was issued to the site. Permit compliance has included development and implementation of a Stormwater Pollution Control Plan that covers all tenant operations. The City anticipates future collaboration between our Industrial Stormwater Program and DEQ Cleanup on future stormwater pathway

evaluation activities at the site. With forthcoming work under DEQ Cleanup and Water Quality authority, onsite sources to Basin S-1 are expected to be identified and controlled.

- **DSU:** Lower levels of copper, zinc, and BEHP were observed in stormwater from this site. Although the site does not qualify for coverage under the NPDES 1200-Z permit, the City Industrial Stormwater Program conducts periodic inspections of the site. Inspection records from March 2012 indicate that site BMPs are in place to minimize operational exposures to stormwater and that catch basin inserts are being implemented to reduce solids loading to Basin S-1.

Based on the results of this investigation, sources of contaminants to Basin S-1 have been identified and are in appropriate programs to select and implement source controls. Therefore, no further City source investigation is needed in Basin S-1.

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Attachments

Attachment A – Field Photographs

Attachment B – Field Notes

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Tables

Table 1
Basin S-1 Stormwater Solids Results

		Upstream -----		-----Downstream				
		Stormwater Solids from Shipyard ⁽¹⁾		Stormwater Solids from City' Basin S-1 Conveyance System			JSCS ⁽²⁾	
		Minimum Detected Concentration	Maximum Detected Concentration	Manhole AAM127 Upstream in 21" line Sediment Trap Solids FO105679 6/15/2010	Composite of Catch Basins ANE509 & ANE512 Inline Solids FO105908 9/16/2010	Composite of Catch Basins ANE503 & ANE507 Inline Solids FO105907 9/16/2010	Screening Level Value	
Class	Analyte	Units					Toxicity	Bioaccumulation
Total Solids (SM 2540G)								
	TS	%	32.8	75.7	33.9	39	56	-- --
Total Organic Carbon (EPA 9060M)								
	TOC	mg/Kg	7400	77,000	NA	200,000	120,000	-- --
Organotins (PSEP GC/MS)								
	Monobutyltin	µg/Kg	66	430	140	49	69	-- --
	Dibutyltin	µg/Kg	210	2,600	380 J	71	140	-- --
	Tributyltin	µg/Kg	280	350,000	580 J	66	150	-- 2.3
	Tetra-n-butyltin	µg/Kg	NA	NA	11 UJ	9.1 U	6.4 U	-- --

Notes:

J = The result is an estimated concentration due to inconsistent matrix spike recoveries, which indicate a non-homogeneous sample matrix.

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

NA = Not analyzed

-- No JSCS screening level available

µg/Kg = Micrograms per kilogram

mg/Kg = Milligram per kilogram

⁽¹⁾ Sources:

ERM, 2008. *Catch Basin Sediment Sampling Summary Report, Portland Shipyard, Portland, Oregon* . March 2008.

ERM, 2011. *Vigor Portland Facility Suspended Sediment Sampling Addendum – Storm Water Source Control Screening Evaluation* . October 21, 2011.

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

bold = Concentration exceeds JSCS Bioaccumulation Screening Level Value

Table 2
Basin S-1 Stormwater Results - Whole Basin

			Sample Location SW1 Manhole AAM131 - Downstream in 36" line						JSCS Stormwater SLVs ⁽¹⁾		
Class	Analyte	Units	Event 1 W11B106-01 2/12/2011	Event 1 Dup W11B106-04 2/12/2011	Event 2 W11C196-01 3/23/2011	Event 3 W11D150-01 4/14/2011	Event 4 W11D257-01 4/28/2011	Event 5 W11E103-01 5/11/2011	Human Health Fish Consumption ⁽²⁾	Human Health Ingestion ⁽³⁾	Ecological ⁽⁴⁾
Total Suspended Solids (SM 2540D)											
	TSS	mg/L	49	53	36	38	14	7	--	--	--
Total Organic Carbon (EPA 415.2)											
	TOC	mg/L	10.8	12.3	3.29	2.46	3.58	3.14	--	--	--
Total Metals (EPA 200.8)											
	Copper	µg/L	53.8	54.2	26.0	50.2	23.1	32.7	--	1300	2.7
	Zinc	µg/L	456	460	361	395	311	338	26000	5000	36
Polychlorinated Biphenyls (PCBs) (EPA 8082)											
	Aroclor 1016/1242	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.96	--
	Aroclor 1221	µg/L	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	--	0.034	0.28
	Aroclor 1232	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.034	0.58
	Aroclor 1248	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.034	0.081
	Aroclor 1254	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.034	0.033
	Aroclor 1260	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.034	94
	Aroclor 1262	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	--	--
	Aroclor 1268	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	--	--
	Total PCBs ⁽⁵⁾	µg/L	ND	ND	ND ⁽⁶⁾	ND	ND	ND	0.000064	0.034	0.014
Polycyclic Aromatic Hydrocarbons (PAHs) (EPA 8270-SIM)											
	1-Methylnaphthalene	µg/L	0.042 J	0.037 J	0.039	0.020 U	0.040 U	0.040 U	--	--	--
	2-Methylnaphthalene	µg/L	0.058 J	0.041 J	0.039	0.021	0.040 U	0.040 U	--	0.2	620
	Acenaphthene	µg/L	0.15 J	0.074 J	0.32	0.071	0.028	0.14	990	0.2	520
	Acenaphthylene	µg/L	0.050 J	0.048 J	0.16	0.049	0.025	0.077	--	0.2	--
	Anthracene	µg/L	0.34 J	0.16 J	0.89	0.22	0.081	0.38	40000	0.2	0.73
	Benzo(a)anthracene	µg/L	0.83 J	0.54 J	3.8	0.88	0.26	1.7	0.018	0.092	0.027
	Benzo(a)pyrene	µg/L	0.77 J	0.54 J	4.6	0.95	0.28	2.0	0.018	0.0092	0.014
	Benzo(b)fluoranthene	µg/L	0.93 J	0.69 J	6.1	1.2	0.39	2.5	0.018	0.092	--
	Benzo(g,h,i)perylene	µg/L	0.51 J	0.38 J	3.0	0.68	0.22	1.3	--	0.2	--
	Benzo(k)fluoranthene	µg/L	0.36 J	0.24 J	2.3	0.47	0.14	0.88 J	0.018	0.2	--
	Chrysene	µg/L	0.93 J	0.64 J	4.5	1.1	0.34	2.2	0.018	0.2	--
	Dibenzo(a,h)anthracene	µg/L	0.17 J	0.12 J	1.1	0.22	0.072	0.46	0.018	0.0092	--
	Fluoranthene	µg/L	1.9 J	1.1 J	7.4	1.9	0.62	3.4	140	0.2	--
	Fluorene	µg/L	0.12 J	0.075 J	0.19	0.060	0.029	0.089	5300	0.2	3.9
	Indeno(1,2,3-cd)pyrene	µg/L	0.47 J	0.35 J	2.8	0.61	0.19	1.2	0.018	0.092	--
	Naphthalene	µg/L	0.066 J	0.051 J	0.048	0.040 U	0.040 U	0.051	--	0.2	620
	Phenanthrene	µg/L	1.3 J	0.64 J	2.6	0.67	0.25	1.3	--	0.2	--
	Pyrene	µg/L	1.8 J	1.1 J	7.6	2.0	0.59	3.3	4000	0.2	--
	Total PAHs ⁽⁵⁾	µg/L	10.8 J	6.8 J	47.5	11.1	3.5	21.0 J	--	--	--

Table 2
Basin S-1 Stormwater Results - Whole Basin

		Sample Location SW1 Manhole AAM131 - Downstream in 36" line						JSCS Stormwater SLVs ⁽¹⁾			
			Event 1 W11B106-01	Event 1 Dup W11B106-04	Event 2 W11C196-01	Event 3 W11D150-01	Event 4 W11D257-01	Event 5 W11E103-01	Human Health Fish Consumption ⁽²⁾	Human Health Ingestion ⁽³⁾	Ecological ⁽⁴⁾
Class	Analyte	Units	2/12/2011	2/12/2011	3/23/2011	4/14/2011	4/28/2011	5/11/2011			
Phthalates (EPA 8270-SIM)											
	Bis(2-ethylhexyl) phthalate (BEHP)	µg/L	2.3 J	2.0 J	1.9	2.5	1.3	1.0	2.2	4.8	3
	Butylbenzylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1900	7300	3
	Di-n-butylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4500	3700	3
	Di-n-octylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1500	3
	Diethylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	44000	29000	3
	Dimethylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	0.80 J	1.0 U	1100000	370000	3

Notes:

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

J = The result is an estimated concentration because the value is less than the MRL but greater than or equal to the MDL, or the QC results indicate matrix effects or non-homogenous sample matrix.

-- No JSCS screening level available

ND = not detected

NC = not calculated. Geometric mean concentrations were calculated only for those constituents selected for evaluation in the Stormwater Evaluation Report (BES, 2010a).

µg/L = Micrograms per liter

mg/L = Milligrams per liter

⁽¹⁾ JSCS SLVs = Portland Harbor Joint Source Control Strategy Screening Level Values (DEQ/EPA Final December 2005, Amended July 2007).


⁽²⁾ The SLVs for chemicals in water taken up by fish for human consumption represent EPA's NRWQC values. If no NRWQC values are available, then DEQ's AWQC values are listed for the constituent.

⁽³⁾ The SLVs for chemicals in water for human ingestion represent the most conservative value between EPA's MCLs and Region 9 PRGs.

⁽⁴⁾ The SLVs for chemicals in water for ecological exposure represent EPA's NRWQC values. If no NRWQC values are available, then DEQ's AWQC values are listed for the constituent. If no AWQC values are available, then Oak Ridge National Laboratory Tier II SCV Technology Benchmark values are listed for the constituent.

⁽⁵⁾ Total PCBs and PAHs are calculated by assigning "0" to undetected constituents.

⁽⁶⁾ WPCL reports that sample W11C196-01 appeared to have a trace amount of Aroclor 1260.

 = Highlighted values have been selected by DEQ for initial upland source control screening evaluations.

bold = Concentration exceeds DEQ's SLV.

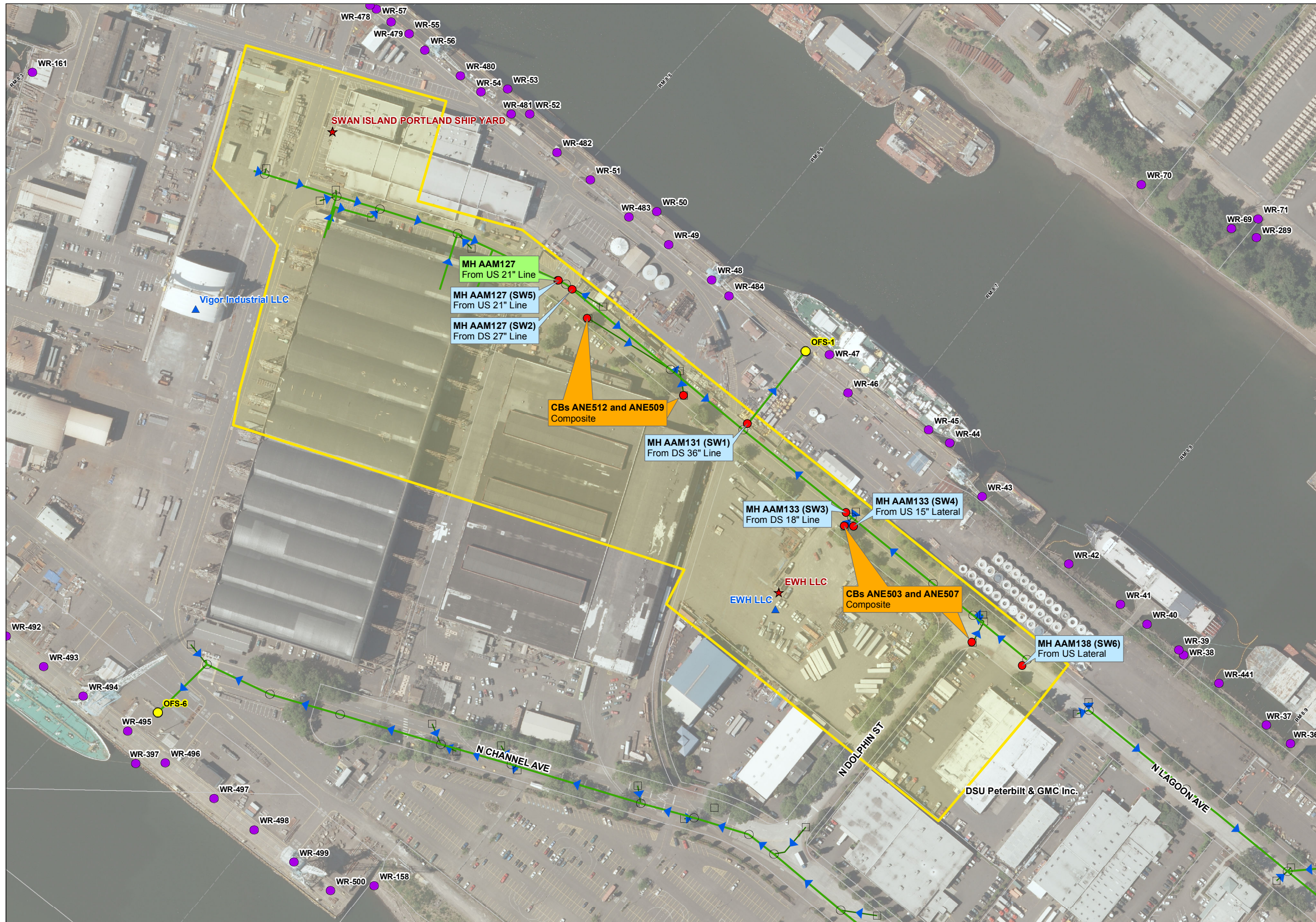
Table 3
Basin S-1 Stormwater Results - West and East Branches

			West Branch					East Branch													JSCS Stormwater SLVs ⁽¹⁾		
			Sample Location SW5 Manhole AAM127 - Upstream in 21" line			Sample Location SW2 Manhole AAM127 - Downstream in 27" line		Sample Location SW6 Manhole AAM138 - Upstream in SW lateral			Sample Location SW4 Manhole AAM133 - Upstream in 15" lateral					Sample Location SW3 Manhole AAM133 - Downstream in 18" line							
			Event 3 W11D150-04	Event 4 W11D257-04	Event 5 W11E103-04	Event 1 W11B106-02	Event 2 W11C196-02	Event 3 W11D150-05	Event 4 W11D257-05	Event 5 W11E103-05	Event 3 W11D150-03	Event 3 Dup W11D150-06	Event 4 W11D257-03	Event 5 W11E103-03	Event 5 Dup W11E103-06	Event 1 W11B106-03	Event 2 W11C196-03	Event 3 W11D150-02	Event 4 W11D257-02	Event 5 W11E103-02			
Class	Analyte	Units	4/14/2011	4/28/2011	5/11/2011	2/12/2011	3/23/2011	4/14/2011	4/28/2011	5/11/2011	4/14/2011	4/14/2011	4/28/2011	5/11/2011	5/11/2011	2/12/2011	3/23/2011	4/14/2011	4/28/2011	5/11/2011			
Total Suspended Solids (SM 2540D)																							
	TSS	mg/L	4	7	13	68	33	10	10	4	212	218	52	53	56	82	76	97	30	29	--	--	--
Total Organic Carbon (EPA 415.2)																							
	TOC	mg/L	1.37	1.97	2.19	25.9	1.18	3.44	11.0	3.8	3.18	3.05	7.57	4.52	4.52	15.7	4.43	2.87	7.69	4.11	--	--	--
Total Metals (EPA 200.8)																							
	Copper	µg/L	29.9	22.3	43.3	146	27.5	15.4	15.9	7.69	62.0	61.2	27.7	27.8	27.7	51.0	33.7	38.7	22.3	18.9	--	1300	2.7
	Zinc	µg/L	319	275	574	907	342	93.9	89.7	71.7	582	571	467	281	278	270	305	335	241	181	26000	5000	36
Polychlorinated Biphenyls (PCBs) (EPA 8082)																							
	Aroclor 1016/1242	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.96	--
	Aroclor 1221	µg/L	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	--	0.034	0.28
	Aroclor 1232	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.034	0.58
	Aroclor 1248	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.034	0.081
	Aroclor 1254	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.034	0.033
	Aroclor 1260	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0618	0.0675	0.0250 U	0.134	0.135	0.0250 U	0.0413	0.0372	0.0250 U	0.0832	--	0.034	94
	Aroclor 1262	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	--	--
	Aroclor 1268	µg/L	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	--	--
	Total PCBs ⁽⁵⁾	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	0.0618	0.0675	ND	0.134	0.135	ND	0.0413	0.0372	ND	0.0832	0.000064	0.034	0.014
Polycyclic Aromatic Hydrocarbons (PAHs) (EPA 8270-SIM)																							
	1-Methylnaphthalene	µg/L	0.020 U	0.040 U	0.040 U	0.056	0.023	0.036	0.047	0.040 U	0.062	0.060	0.040 U	0.060	0.061	0.046	0.060 U	0.040	0.040 U	0.042	--	--	--
	2-Methylnaphthalene	µg/L	0.020 U	0.040 U	0.040 U	0.081	0.030	0.035	0.058	0.040 U	0.060 U	0.060 U	0.040 U	0.058	0.059	0.049	0.060 U	0.040 U	0.040 U	0.045	--	0.2	620
	Acenaphthene	µg/L	0.020 U	0.020 U	0.020 U	0.023	0.020 U	0.020 U	0.020 U	0.020 U	0.19	0.21	0.12	0.83	0.85	0.11	0.48	0.18	0.076	0.46	990	0.2	520
	Acenaphthylene	µg/L	0.020 U	0.020 U	0.020 U	0.036	0.020 U	0.020 U	0.020 U	0.020 U	0.16	0.17	0.11	0.39	0.43	0.048	0.28	0.11	0.060	0.23	--	0.2	--
	Anthracene	µg/L	0.020 U	0.020 U	0.020 U	0.035	0.020 U	0.024	0.020 U	0.020 U	0.69	0.75	0.44	2.3	2.4	0.24	1.4	0.55	0.25	1.3	40000	0.2	0.73
	Benzo(a)anthracene	µg/L	0.010 U	0.010 U	0.010	0.063	0.031	0.010 U	0.010 U	0.010 U	2.8	2.9	1.9	9.2	9.7	0.68	7.0	2.3	1.1	5.1	0.018	0.092	0.027
	Benzo(a)pyrene	µg/L	0.010 U	0.010 U	0.012	0.064	0.035	0.017	0.010 U	0.010 U	3.0	3.1	2.2	10	11	0.65	8.7	2.5	1.3	5.9	0.018	0.0092	0.014
	Benzo(b)fluoranthene	µg/L	0.010 U	0.010 U	0.017	0.11	0.051	0.010 U	0.010 U	0.010 U	3.9	4.1	3.3	13	13	0.75	12	3.4	1.6	7.1	0.018	0.092	--
	Benzo(g,h,i)perylene	µg/L	0.010 U	0.010 U	0.016	0.095	0.037	0.017	0.016	0.010 U	2.2	2.2	1.3	6.5	6.9	0.46	5.6	1.8	0.95	3.7	--	0.2	--
	Benzo(k)fluoranthene	µg/L	0.010 U	0.010 U	0.010 U	0.034	0.016	0.054	0.010 U	0.010 U	1.6	1.5	1.4	4.6 J	5.7 J	0.31	4.1	1.1	0.72	3.2 J	0.018	0.2	--
	Chrysene	µg/L	0.010 U	0.010 U	0.017	0.11	0.047	0.010 U	0.010 U	0.010 U	3.5	3.7	2.6	11	12	0.82	8.8	2.8	1.4	6.3	0.018	0.2	--
	Dibenzo(a,h)anthracene	µg/L	0.010 U	0.010 U	0.010 U	0.018	0.010 U	0.010 U	0.010 U	0.010 U	0.70	0.72	0.50	2.2	2.2	0.14	1.8	0.58	0.33	1.4	0.018	0.0092	--
	Fluoranthene	µg/L	0.018	0.014	0.037	0.21	0.088	0.023	0.018	0.021	6.1	6.3	4.0	18	19	1.4	14	4.9	2.1	11	140	0.2	--
	Fluorene	µg/L	0.020 U	0.020 U	0.020 U	0.043	0.020 U	0.020 U	0.020 U	0.020 U	0.17	0.17	0.095	0.48	0.49	0.097	0.29	0.13	0.058	0.27	5300	0.2	3.9
	Indeno(1,2,3-cd)pyrene	µg/L	0.010 U	0.010 U	0.010 U	0.053	0.025	0.010 U	0.010 U	0.010 U	2.0	2.0	1.3	6.1	6.6	0.41	5.2	1.6	0.89	3.5	0.018	0.092	--
	Naphthalene	µg/L	0.040 U	0.040 U	0.040 U	0.11	0.040 U	0.040 U	0.042	0.043	0.12 U	0.12 U	0.056	0.054	0.068	0.056	0.12 U	0.080 U	0.041	0.048	--	0.2	620
	Phenanthrene	µg/L	0.020 U	0.020 U	0.037	0.16	0.052	0.039	0.022	0.027	2.2	2.3	1.3	6.7	7.0	0.92	4.6	1.8	0.81	3.8	--	0.2	--
	Pyrene	µg/L	0.023	0.016	0.036	0.21	0.091	0.048	0.028	0.023	6.7	6.8	4.3	18	19	1.5	15	5.1	2.3	10	4000	0.2	--
	Total PAHs ⁽⁵⁾	µg/L	0.041	0.030	0.182	1.51	0.53	0.293	0.23	0.114	36.0	37.0	24.9	109 J	116 J	8.7	89	28.9	14.0	63 J	--	--	--
Phthalates (EPA 8270-SIM)																							
	Bis(2-ethylhexyl) phthalate (BEHP)	µg/L	1.2	0.74 J	1.1	2.2	1.1	2.6	2.9	1.3	5.1	5.0	3.2	1.7	1.9	3.7	3.3	3.2	2.6	1.4	2.2	4.8	3
	Butylbenzylphthalate	µg/L	1.0 U	0.69 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1900	7300	3
	Di-n-butylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	2.0 U	1.0 U	1.0 U	4500	3700	3
	Di-n-octylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	3.0 U	0.78 J	1.0 U	1.0 U	1.0 U	3.0 U	2.0 U	0.53 J	1.0 U	--	1500	3
	Diethylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	3.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	2.0 U	1.0 U	1.0 U	44000	29000	3
	Dimethylphthalate	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.9	1.0 U	3.0 U	3.0 U	1.4	1.0 U	1.0 U	1.0 U	3.0 U	2.0 U	2.0	1.0 U	1100000	370000	3

Notes:

- U = The analyte was not detected above the reported sample quantification limit.
- J = The result is an estimated concentration because the value is less than the MRL but greater than or equal to the MDL, or the QC results indicate matrix effects or non-homogenous sample matrix.
- No JSCS screening level available
- ND = not detected
- µg/L = Micrograms per liter
- mg/L = Milligrams per liter
- ⁽¹⁾ JSCS SLVs = Portland Harbor Joint Source Control Strategy Screening Level Values (DEQ/EPA Final December 2005, Amended July 2007).
- ⁽²⁾ The SLVs for chemicals in water taken up by fish for human consumption represent EPA's NRWQC values. If no NRWQC values are available, then DEQ's AWQC values are listed for the constituent.
- ⁽³⁾ The SLVs for chemicals in water for human ingestion represent the most conservative value between EPA's MCLs and Region 9 PRGs.
- ⁽⁴⁾ The SLVs for chemicals in water for ecological exposure represent EPA's NRWQC values. If no NRWQC values are available, then DEQ's AWQC values are listed for the constituent. If no AWQC values are available, then Oak Ridge National Laboratory Tier II SCV Technology Benchmark values are listed for the constituent.
- ⁽⁵⁾ Total PCBs and PAHs are calculated by assigning "0" to undetected constituents.
- ⁽⁶⁾ WPCL reports that sample W11C196-01 appeared to have a trace amount of Aroclor 1260.
- = Highlighted values have been selected by DEQ for initial upland source control screening evaluations.
- bold** = Concentration exceeds DEQ's SLV.

Figures



- LEGEND**
- Outfall Basin S-1
 - Sample Locations
 - Sediment Trap Sample
 - Inline Solids Sample
 - Stormwater Sample
 - City Outfall
 - Non-City Outfall
 - Storm Line
 - Manhole (MH)
 - Catch Basin (CB)
 - DEQ ECSI Site
 - Stormwater Permit
 - Tax Lot
 - River Mile Tenths

NOTES:
DS - Downstream
US - Upstream

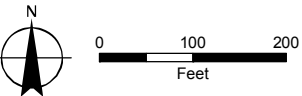


FIGURE 1
Outfall Basin S-1
Drainage Basin Overview
and Sample Locations

Disclaimer:
Information contained on this map is accurate according to available records, however the City of Portland makes no warranty, expressed or implied, as to the completeness or accuracy of the information published.

Prepared By:
GSI, June 6, 2012
005_SCIR/OF_Basin_S1
TM_OFS1_1

Source:
City of Portland BES,
Aerial Photo 2010

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



Shipyards Concentration Ranges:⁽¹⁾
(Nov. 2007 and Oct. 2011)

Monobutyltin	66 - 430
Dibutyltin	210 - 2,600
Tributyltin	280 - 350,000
Tetra-n-butyltin	NA

MH AAM127
(06/15/10)

Monobutyltin	140
Dibutyltin	380 J
Tributyltin	580 J
Tetra-n-butyltin	ND

CBs ANE512 and ANE509, Composite
(09/16/10)

Monobutyltin	49
Dibutyltin	71
Tributyltin	66
Tetra-n-butyltin	ND

CBs ANE503 and ANE507, Composite
(09/16/10)

Monobutyltin	69
Dibutyltin	140
Tributyltin	150
Tetra-n-butyltin	ND



- LEGEND**
- Outfall Basin S-1
 - Sample Locations
 - Sediment Trap Sample
 - Inline Solids Sample
 - Shipyards Stormwater Solids - Summary Data
 - City Outfall
 - Non-City Outfall
 - Storm Line
 - Manhole (MH)
 - Catch Basin (CB)
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 - Stormwater Permit
 - Tax Lot
 - River Mile Tenths

NOTES:
All results presented in micrograms per kilogram ($\mu\text{g}/\text{kg}$).
J = Estimated
ND = Not Detected
NA = Not Analyzed
1. Sources: Catch Basin Sediment Sampling Report (ERM, 2008)
Vigor Portland Facility Suspended Sediment Sampling Addendum (ERM, 2011)

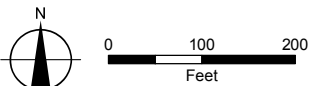


FIGURE 2
Basin S-1
Stormwater Solids Organotins

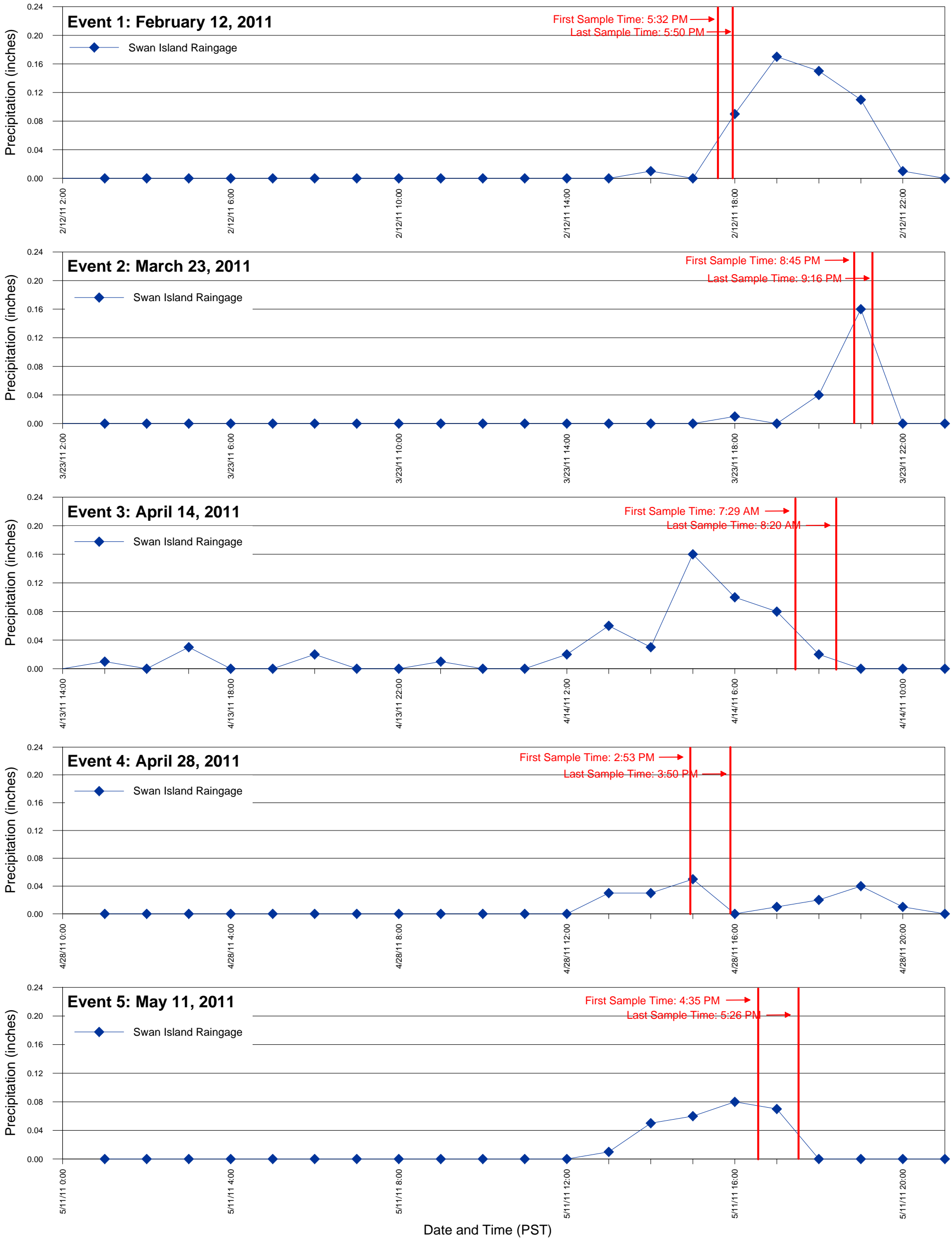
Disclaimer:
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Prepared By:
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005_SCIRI/OF_Basin_S11
TM_OFS1_1

Source:
City of Portland BES,
Aerial Photo 2010

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CITY OF PORTLAND
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Portland Oregon, 97204-1912

Figure 3
Basin S-1
Storm Event Precipitation Graphs



Event Number	Sample Date and Time (PST)	Sample Type	Antecedent Dry Period ⁽¹⁾	Minimum Forcasted Rainfall Total (inches) ⁽²⁾	First Flush Event? ⁽³⁾
1	2/12/2011 17:32 - 17:50	Grab	4 days	0.58	Yes
2	3/23/2011 20:45 - 21:16	Grab	2 days	0.15	Yes
3	4/14/2011 7:29 - 8:20	Grab	12 hours	0.37	No
4	4/28/2011 14:53 - 15:50	Grab	17 hours	0.18	Yes
5	5/11/2011 16:35 - 17:26	Grab	3 days	0.19	No

PST = Pacific Standard Time
Rain gage data obtained from USGS, Oregon Water Science Center (<http://or.water.usgs.gov/non-usgs/bes/>)
(1) Cumulative rainfall during this time less than 0.10 inches.
(2) Minimum forecasted rainfall data provided by Extended Range Forecasting, Inc.
(3) First flush sampling is typically conducted within the first 3 hours of stormwater discharge, but varies depending on the basin size and land use characteristics.



- LEGEND**
- Outfall Basin S-1
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 - Stormwater Permit
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 - River Mile Tenths

NOTES:
All results presented in micrograms per liter (µg/L).
J = Estimated
ND = Not Detected

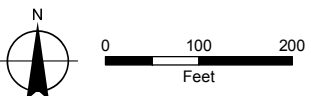


FIGURE 4
Basin S-1
Stormwater
Total PAHs

Disclaimer:
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Prepared By:
GSI, June 6, 2012
005_SCIRI/OF_Basin_S11
TM_OFS1_1

Source:
City of Portland BES,
Aerial Photo 2010

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



- LEGEND**
- Outfall Basin S-1
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NOTES:
All results presented in micrograms per liter (µg/L).
J = Estimated
ND = Not Detected

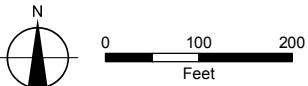


FIGURE 5
Basin S-1
Stormwater
Copper, Zinc, Total PCBs and BEHP

Disclaimer:
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Prepared By:
GSI, June 6, 2012
005_SCIRI/OF_Basin_S11
TM_OFS1_1

Source:
City of Portland BES,
Aerial Photo 2010

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

Attachment A

Field Photographs

Sediment Trap Investigation



Photo 1 (February 19, 2010). View from inside manhole AAM127, looking upstream into the 21-inch line entering the manhole from the northwest.



Photo 2 (March 17, 2010). Screened Inline Flow-Through (SIFT)© ¹ style sediment trap installed in the 21-inch line entering manhole AAM127 from the northwest.

¹ 2009 City of Portland. These traps are proprietary and patent pending. These traps were designed by the City for use in smaller pipe diameters and low-flow depth conditions.



Photo 3 (March 17, 2010). Primary and secondary sediment trap chambers at monthly field check.



Photo 4 (June 15, 2010). Final homogenized composite sample from ST1/manhole AAM127 sediment trap.

Catch Basin Investigation: September 16, 2010

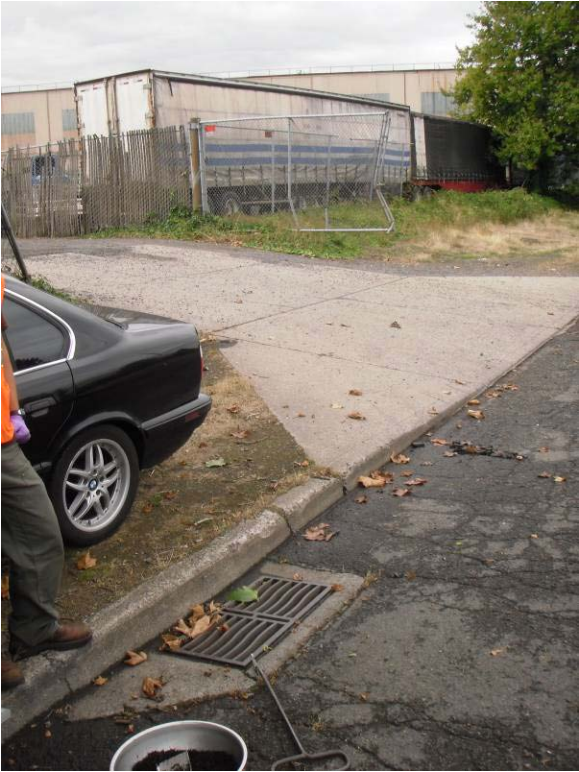


Photo 5. Sampling location at catch basin ANE503. View is to the northwest.



Photo 6. Catch basin ANE503; solids were collected from the rim of the catch basin inlet and the area between inlet and curb.



Photo 7. Sampling location at catch basin ANE507. View is to the northwest.



Photo 8. Catch basin ANE507.

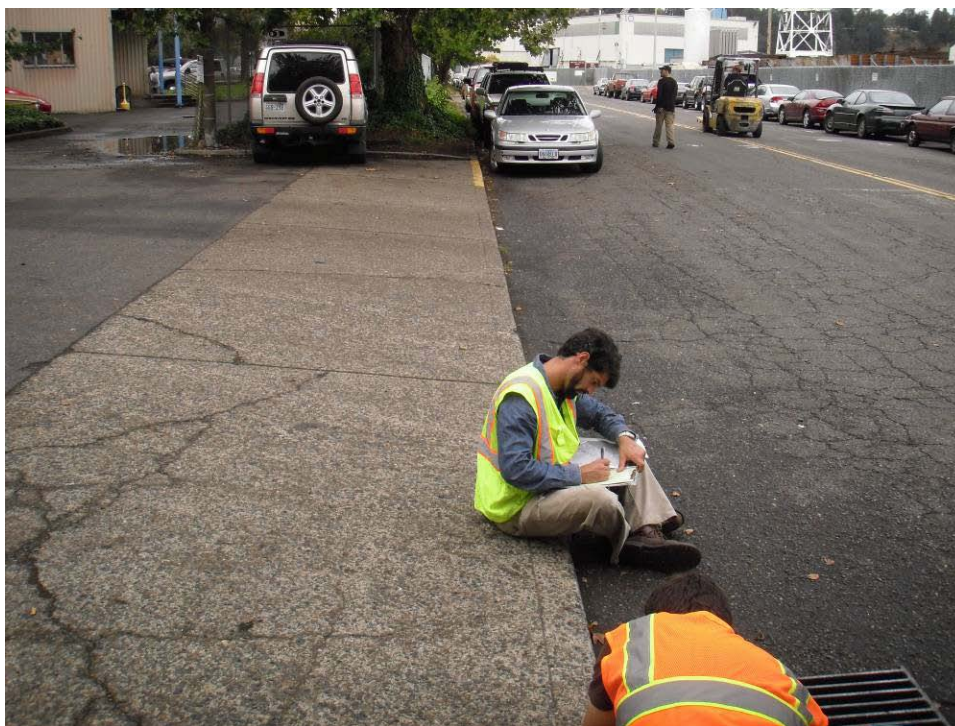


Photo 9. Sample location at catch basin ANE509. View is to the northwest.



Photo 10. Catch basin ANE509; view of solids sampled.

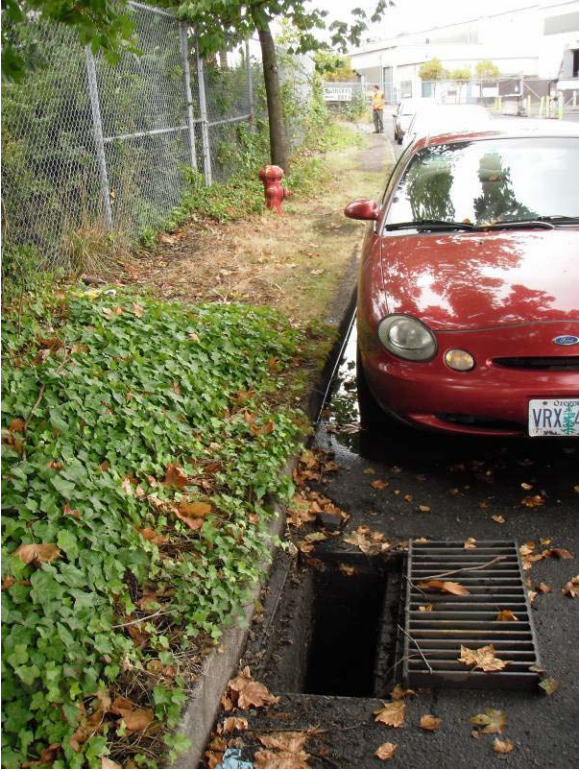


Photo 11. Sampling location at catch basin ANE512. View is to the northwest.



Photo 12. Catch basin ANE512; view of solids sampled.

Stormwater Investigation

Location SW1 – Manhole AAM131



Photo 13 (May 11, 2011). Manhole AAM131. View is to the west.



Photo 14 (April 28, 2011). View into manhole AAM131. Outgoing 36-inch pipe (SW1) is labeled.

Location SW2/SW5 - Manhole AAM127

Photo 15 (April 28, 2011). Manhole AAM127. View is to the west. Gate to Shipyard site is visible in the background.



Photo 16 (April 14, 2011). View into manhole AAM127. Incoming 21-inch line from Shipyard site (SW5) and outgoing 27-inch line (SW2) are labeled.

Location SW3/SW4 – Manhole AAM133



Photo 17 (May 11, 2011). Manhole AAM133. View is to the west.



Photo 18 (May 11, 2011). View into manhole AAM133; incoming 15-inch lateral from EWH LLC site (SW4) and outgoing 18-inch pipe (SW3) are labeled.

Location SW6 – Manhole AAM138



Photo 19 (April 28, 2011). Manhole AAM138. View is to the west-northwest.



Photo 20 (April 28, 2011). View into manhole AAM138. Flow from incoming lateral from DSU Peterbilt site (SW6) is labeled.

Attachment B

Field Notes

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Sediment Trap Investigation

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Page 1 of 2

Project Portland Harbor Stormwater Intake Sed Sampling
Location S1, South MH node AAM133
Subject Daily notes

Project No. 1020.005
Date 2/19/10
By AJA, JXB, MAW

On site at customer's request to investigate the presence or absence of sampleable solids in node AAM133 and its laterals.

1045 Node AAM133, N. Lagoon Ave

Pipe Diameters:

19" at outlet pipe

15" at Inlet pipe

16" above invert floor is 15" concrete lateral coming from West - unknown lateral connection

34" above invert floor is 8" lateral Also

coming from West. probably from West Catch basin

38" Above Manhole floor is 8" lateral from Catch basin to the East

No sampleable solids in any pipes.

River does not appear to back up to this site.

Active baseflow present but only 0.1" depth

See attached map on page 2.

Attachments



Page 1 of 2 ^{AM} ~~2~~

Project Portland Harbor ^{Stormwater} Intake Sump
Location N. Lagoon Ave at Vigor ^{3/26/10} back gate
Subject Basin S1 - ST1 daily notes

Project No. 1020.005
Date 2/19/10
By AJA, JXR, MAW

0945 On site at Basin S1 (N. Lagoon at Vigor back gate) to install SIFT in node AAM127. Confirmed pipes + diameters; all match the GIS maps.

15" lateral from Service Steel property has a drop shaft located approximately 8" upstream from EOP. About 1' (foot) drop. Lateral is concrete, not corrugated. Photo 1497

~~8" lateral coming from south. photo 1497~~

Confirm whether or not 8" lateral exists ★
Main inlet pipe confirmed as 21" free of solids.

Main outlet pipe is 27" about 1" standing water present.

No solids present in any pipes or laterals

Photos: Inlet = 1498
Drop shaft = 1499
Outlet = 1500

★ Confirmed that 8" lateral does exist, enters node about 10' off floor from SE. Likely from CB ANE511. on

Attachments Sat Ind Sump 3/13/10. Lateral confirmed to come from CB ANE511 by both sound and water test. 3/17/10. ANE512 is not connected to the unmapped 8" lateral.



Page 2 of 2

Project Bx Harbor Inflow Stormwater Sump
Location S1-ST1 (JXB) 3/26/10
Subject Field notes

Project No. 1020.005
Date 2/19/10
By AJA, JXB, MAW

Install notes cont. Drop shaft outlet is about 16" above
Invert (floor of node)

SIFT installed on upstream side of node using the
offset Hach band, bolted.

*Tether needed for next visit.

SIFT installed with 18° up angle.

Front of SIFT about 19" upstream from EOP in 21"
pipe.

Attachments

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

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



INLINE SEDIMENT TRAP FIELD DATA SHEET

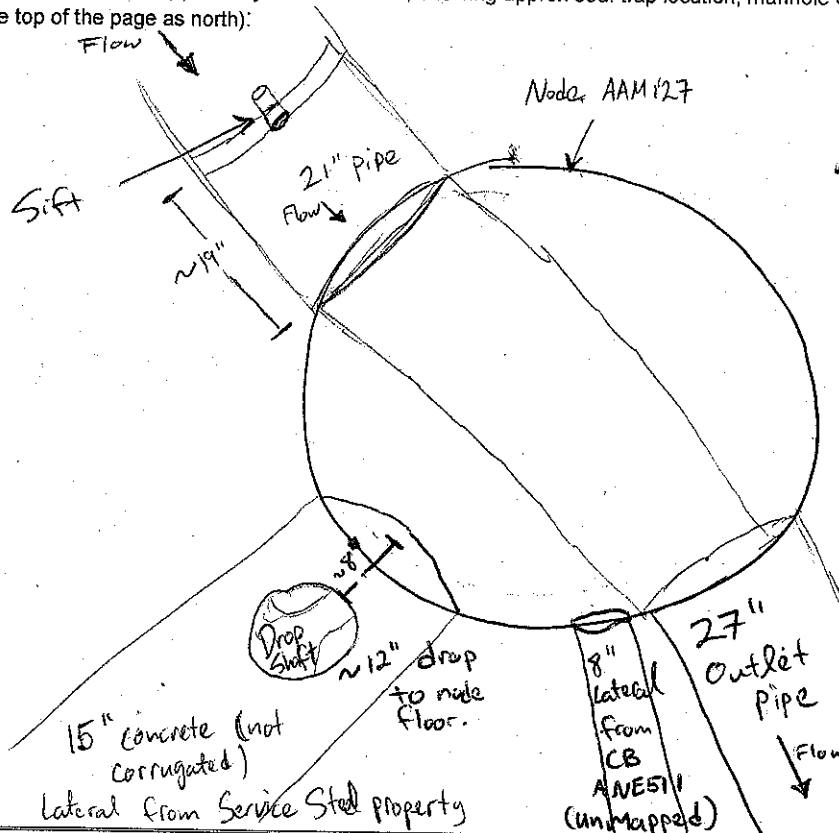
Project Name: Portland Harbor Stormwater Samp.	Project No.: 1020.005	Date: 2/19/10	By: AJA JXB MAW
Site Address: N. Lagoon near Vigor back gate	Sample Pt Code: S1 - ST1	Basin: S1	Hansen ID: AAM 127

SECTION 1 - INSTALLATION INFORMATION

Traffic control and/or site access concerns: Man Hole located on N. Lagoon at back gate (North East Gate) of Vigor. Also near entrance to a steel industry. Traffic is light, maybe 10 cars per hour. (One Island T.C. is sufficient.)		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 flow at installation. Approx. 1" standing water in 27" outlet Pipe. River does not appear to back up to this point.	
Describe sediments in pipe if present (depth, sampleable quantities, lateral extent, etc.): No Sediments in Node and laterals.		Sed trap bottles installed on: 2/19/10	
Sediment trap location(s) (pipe size, distance from center of node, proximity to laterals, etc.): Trap installed w/ offset back band mount, bolted ~ 19" u/s of node in 21" pipe.		Pipe diameter (inches): 21" u/s Distance from MH node (feet): ~ 3 ft ~ 19"	

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):



Note: 8" Lateral from CB ANE511 enters node approx 10' off of node floor.

SIFT installed at an 180° up angle.

Pt. Code SI-ST1		SECTION 2 - MONTHLY FIELD CHECK INFORMATION		Hansen ID: April 27
Date: 3/17/10	Estimated sed. depth per bottle (% by volume & inches): PRIMARY US Bottle - empty SECONDARY DS Bottle - trace - 0.25"	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By: MSS PTB		Final Removal? Y/N		
Comments: Leeks built up around housing. Pipe is wetted & not flowing. SIFT re-installed @ ~20° angle. PRIMARY US Bottle - no sediment or debris in primary SECONDARY DS Bottle - Fine organic silts ranging in depth from a trace to 0.25"				SI-ST1 3/17/10 69.38
Photos Taken? Y/N 100-0007 SIFT in-situ 100-0008 primary & secondary traps opened Describe:				Tare weight of jar (+ lid) 190.8g
Date: 4/14/10	Estimated sed. depth per bottle (% by volume & inches): PRIMARY US Bottle - Empty SECONDARY DS Bottle - Trace 0.25"	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By: OK, MSS PTB		Final Removal? Y/N		
Comments: Leaves built up around housing. Pipe is wetted but not flowing. Re-installed @ 20° angle Primary: Empty. No seeds. Secondary: Trace accumulation across face of screen. Clumps in depth up to 1/4" of fine silts and organic matter (fibrous).				SI-ST1 4/14/10 1002 11.1g
Photos Taken? Y/N 003 - Secondary chamber 004 - Close-up of secondary chamber Describe:				
Date: 6/15/10	Estimated sed. depth per bottle (% by volume & inches): PRIMARY US Bottle - EMPTY SECONDARY DS Bottle - 1/4" avg.	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID
By: MSS PTB		Final Removal? Y/N		
Comments: Few leaves and pieces of plastic surrounding SIFT but no obstructions. Pipe is wetted but not flowing. Primary: Essentially no seeds. Trace accumulations on invert of primary. Secondary: 1/8" across face, 1/4" on invert, 1/2" where invert meets screen and 2 3/4" deep area of mostly coarse organics near top of face. Overall 1/4" average of fine organics and silts.				SI-ST1 6/15/10 1002 36.5g
Photos Taken? Y/N Describe: Photo 2 of Primary & Secondary chambers				

Pt. Code		SECTION 2 – MONTHLY FIELD CHECK INFORMATION		Hansen ID:
Date:	Estimated sed. depth per bottle (% by volume & inches):		Bottles removed/replaced? Y/N If removed which one(s)?	Archived ID:
By:	US Bottle - Bottle -	DS Bottle - Bottle -	Final Removal? Y/N	
Comments:				Holding Sticker
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				Holding Sticker
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):		Bottles removed/replaced? Y/N If removed which one(s)?	
By:	US Bottle - Bottle -	DS Bottle - Bottle -	Final Removal? Y/N	Archived ID:
Comments:				
US Bottle -				Holding Sticker
DS Bottle -				
Photos Taken? Y/N				
Describe:				Holding Sticker
Date:	Estimated sed. depth per bottle (% by volume & inches):		Bottles removed/replaced? Y/N If removed which one(s)?	
By:	US Bottle - Bottle -	DS Bottle - Bottle -	Final Removal? Y/N	
Comments:				Holding Sticker
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				Holding Sticker
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):		Bottles removed/replaced? Y/N If removed which one(s)?	
By:	US Bottle - Bottle -	DS Bottle - Bottle -	Final Removal? Y/N	Archived ID:
Comments:				
US Bottle -				Holding Sticker
DS Bottle -				
Photos Taken? Y/N				
Describe:				Holding Sticker

Pt. Code:		SECTION 2 – MONTHLY FIELD CHECK INFORMATION		Hansen ID:
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID:
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		<div style="border: 1px solid black; border-radius: 50%; width: 50px; height: 50px; display: flex; align-items: center; justify-content: center;"> Holding Sticker </div>
Comments:				
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				
Describe:				
Date:	Estimated sed. depth per bottle (% by volume & inches):	Bottles removed/replaced? Y/N If removed which one(s)?		Archived ID:
By:	US Bottle - DS Bottle - Bottle - Bottle -	Final Removal? Y/N		<div style="border: 1px solid black; border-radius: 50%; width: 50px; height: 50px; display: flex; align-items: center; justify-content: center;"> Holding Sticker </div>
Comments:				
US Bottle -				
DS Bottle -				
Photos Taken? Y/N				
Describe:				

Pt. Code:		SECTION 3 – COMPOSITE SAMPLE		Hansen ID:
51-5T1				AA1127
Sample ID: F0105679 affix FO number sticker	Duplicate sample collected at this site? Y/N	DUPLICATE ID: NA		
Duplicate Sample ID on COC: affix FO number sticker	Any deviations from standard operating procedures? Y/NA			
Describe:				
Comments:				



Page 1 of 1

Project PORTLAND HARBOR STORMWATER SAMP
Location Basin S1 ~~Sediment Trap~~ installation ^{ST2} 4/19/10
Subject 1st Monthly SIFT check

Project No. 1020.005
Date 3/17/10
By PTB, MAW, MJS

0920 Arrive on-site @ S1-ST1 (AAM127) to perform first monthly field check of this SIFT at this location.

0930 Removed accumulated solids and placed in archive sample jar previously tared. (190.8g)

0949 Re-installed SIFT.

S1-ST1

Total Weight w/ Sedst Jar & Lid = 199.5g

Weight of Jar & Lid = 190.8g

Total Sed Weight = 8.7g



Page 1 of 2

Project PORTLAND HARBOR STORMWATER SAMP
Location BASIN S1
Subject Monthly SIFT check

Project No. 1020.005
Date 4/4/10
By CJK, MAW, PTB

0944 Arrive on-site S1-ST1. Set up TC, prepare for entry.
1002 Collected sediment into archive jar for this site.
1015 Re-installed SIFT.

Attachments

Portland Harbor Stormwater Camp

Basin 51

1020.005
4/14/10
CSK, MAW, RTB

SITE	TOTAL WEIGHT OF JAL + LID + SEEDS	WEIGHT OF JAL + LID	TOTAL COLLECTED WEIGHT OF SEEDS 800 ^{111.1g}	3/17/10 WEIGHT OF SEEDS PREVIOUSLY	THIS MONTH'S SEED WEIGHT ACCUMULATION
SL-511	210.6g	190.8g	19.8g	-8.7g ✓	11.1g ✓



Page 1 of 1

Project PORTLAND HARBOR STORMWATER SAMP

Project No. 1020-005

Location BASIN 51

Date 6/15/10

Subject SIFT Removal & Processing

By MIS, PTB

0940 Arrive on-site AAM127 to remove SIFT for end of season per customer request.
1002 Collected seeds from SIFT into archive jar to be homogenized for submittal back at WPCL. Removed band from pipe.
1009 Departed site.
1505 Homogenized sample using decontaminated stainless steel spoon to composite all months' accumulations into one composite for submittal.
1515 Finished homogenization.

Attachments

Date: 6/15/10
Crew: PTB, MSS

[illegible]



Collected By: MJS, PTB

Requested Analyses

Matrix: SEDIMENT

Requested Analyses

Basin S-1 Sediment Trap Chain-of-custody

Sediment traps installed: 2/19/10

Sediment traps removed: 6/15/10

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.

WPCL Sample I.D.	Location	Point Code	Sample Date	Sample Time	Sample Type
------------------	----------	------------	-------------	-------------	-------------

FO105679

ST-S1-AAM127-0610
NLAGOON AT VIGOR GATE

S1-ST1

6/15/10

1515

PCB Congeners (All 209)

PCB Aroclors (Low-level)

Organotins

Grain Size

TOC

TS*

Total Metals (As, Cd Cr, Cu, Pb, Ni, Ag, Zn) + Hg

Analysis added per PHA-6/18/10

TS = 33.9% 56.1 g Total Wet Weight

[illegible]

Signature:		Time:	1620
Signature:		Time:	1620
REINQUISHED BY: 3.			
Signature:		Time:	
REINQUISHED BY: 4.			
Signature:		Time:	

Printed Name:	Date:	Printed Name:	Date:	Printed Name:	Date:
Peter Bryant	6/15/10				

Received By: 1. <i>W. J. P.</i>	Received By: 2.	Received By: 3.	Received By: 4.
---------------------------------	-----------------	-----------------	-----------------

Signature: 	Time:	Signature: 	Time:
	Date:		Date:

S:\EID\10001\020\005 - Portland Harbor Stormwater Sample\FY 2008_2009 Sediment Trap Sampling\Portland Harbor Stormwater Basin S1 Sed Trap COCs (6-15-10).xls



CITY OF PORTLAND
ENVIRONMENTAL SERVICES

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



INLINE SEDIMENT TRAP SAMPLE PROCESSING DATA SHEET

Project Name: Portland Harbor Stormwater Samp

Project Number: 1020.005

Sample Processing Conducted By:

PTB

Sample Pt. Code:

S1-S11

Removal Date:

6/15/10

Processing Date:

6/15/10

Basin: S1

Hansen ID: AAM127

Subbasin: NA

Sediment Trap Location Description/Address:

N Lagoon near Vigor back gate. SFT placed upstream of node ~19".

SEDIMENT TRAP PROCESSING/FILTRATION NOTES

~~Filter Equipment/Method:~~
~~Homogenized in archive jar with decontaminated spatula.~~

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).~~

Sediment Trap Bottle ID: S1-S11

Sediment Trap Bottle ID: - - -

Total Est. ^{weight of} Depth of Accumulated Sed in Bottle (inches) ^{lid} 247.1g ^{prior to homogenization}

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

Sample Processing Start Time: 1505

Sample Processing End Time: 1515

Sample Processing Start Time:

Sample Processing End Time:

~~Number of Filters Used:~~

Number of Filters Used:

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

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

Tare Weight [empty jar in grams (g)]: 190.8g
Weight of seeds plus jar lid post-homogenization: 246.9g
~~Dewatered/Filtered Sed. Weight (g): 56.1g~~

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

Dewatered/Filtered Sed. Weight (g):

Sample Processing Notes/Comments:

Homogenized all months' archived seeds in archive jar using decontaminated stainless steel spatula.

Sample Processing Notes/Comments:

Visual Description of Final Composite Sample: Moist brown seeds 75% fine silts and 25% fine sands.

COC Time (time composite jar is capped): 1515

Total ~~Dewatered/Filtered~~ Sed. Weight in grams (g): 56.1

Sample Jars Collected (number, size, full or partial): 1/4 full 8 oz. jar

Sample ID: FO105679
affix FO numt

Duplicate sample collected? Y ☒ DUPLICATE ID

Duplicate Sample ID on COC:
affix FO number sticker

Any deviations from standard operating procedures? Y ☒ NA
Describe:

Catch Basin Investigation

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Page 1 of 1

Project Portland Harbor Inline Samp.

Project No. 1020.001

Location N. Lagoon Ave - Basin 5-1

Date 9/16/10

Subject Catch basin sampling

By MJS, PTB, CJK

1350 - on site at N. Lagoon + Dolphin St. at Node ANE 507.

Catch basin is curb-cut type of stormwater inlet.

ANE 503 - standard type of catch basin - no material in catch basin but some material along rim of grate and along curb side edge of catch basin.

1424 - on site at ANE 509; No material accumulated in the floor of the catch basin, so removed all material that is present along the lip of the grate and the walls of the catch-basin. ANE 512 has ~6" of material accumulated in the bottom - collected 5 sub samples, 4 in corners and one in the center. ANE 517 could not be located - appears that it does not exist. Examined catch basin directly across N. lagoon from ~~ANE 515~~ ANE 512 for potential sample collection, but it has no material to sample.

Composited roughly equal volumes from ANE 509 and ANE 512 and homogenized to fill jars.



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



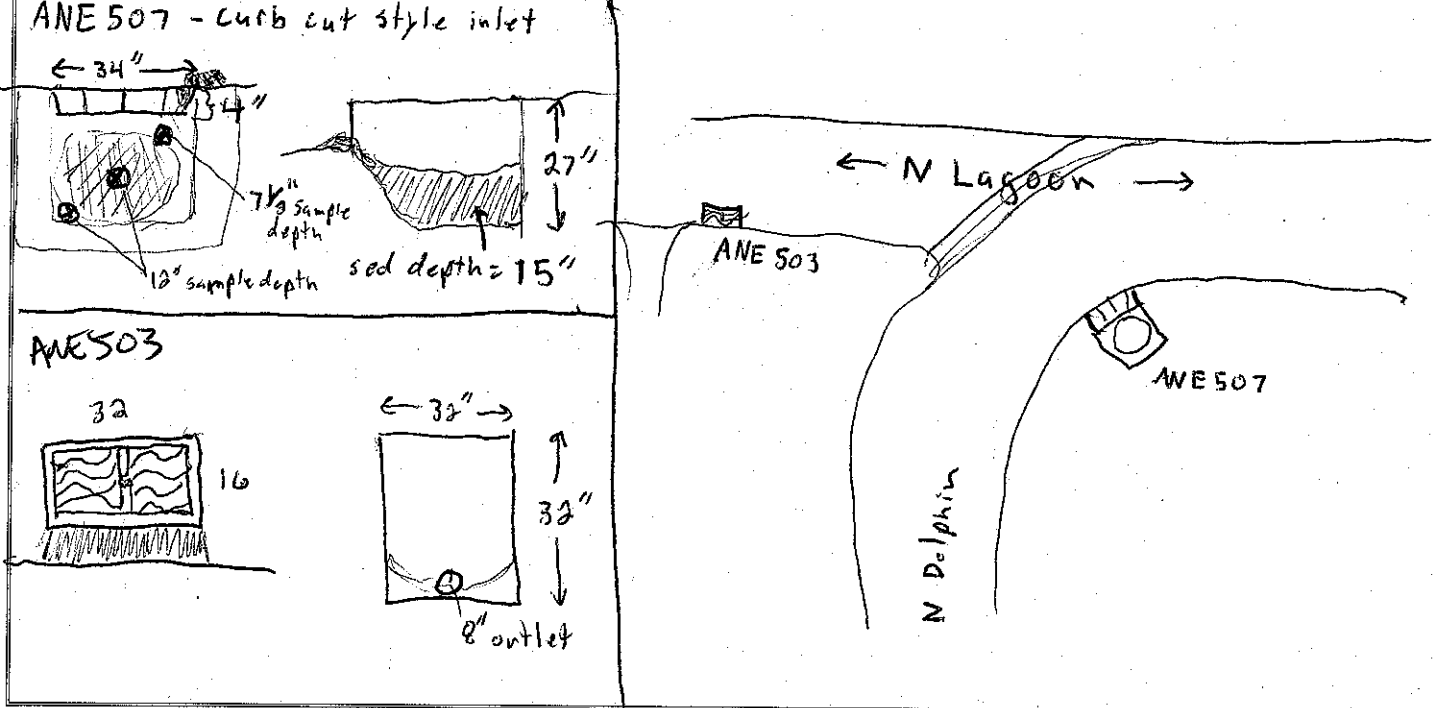
CATCH BASIN SOLIDS SAMPLING
FIELD DATA SHEET

Project Name: PORTLAND HARBOR INLWE CAMP		Project Number: 1020.001
Sampling Team: MJS, PTB, CLK	Date: 9/16/10	Arrival Time: 1350
Basin: S-1	Node: ANE 507 / ANE 503	Address: 5851 N LAGOON N Lagoon and Dolphin
Current weather and last known rainfall: Overcast, ~0.2" of rain earlier today		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe potential solids or contaminant sources that could impact catch basin (const. activities, erosion, vehicles, material storage, onsite processes, etc.):	heavy truck traffic	
Describe debris and/or clogging around, or in catch basin grate/cover:	ANE 507 1" of accumulation along up-stream edge	ANE 503 none
Is there standing water in catch basin?	no	
Describe visual or olfactory observations of contamination at catch basin if any (odor, sheen, discoloration, etc.):	none	
Describe depth of sediments present in catch basin and the total depth of the catch basin or sump:	ANE 507 15" sediment depth	ANE 503: no sediment in catch basin, 1/4" of sediment around grate lip and curb-side of CB inlet at street level

SITE DIAGRAM: Include street intersections, inlets and outlets, catch basin dimensions, etc.



SI-1

Date: 9/16/10	SECTION 2 - SAMPLE COLLECTION REPORT		Node: ANE 507 & ANE 503
Sampling Equipment:	<input checked="" type="checkbox"/> stainless steel spoon & stainless steel bucket <input type="checkbox"/> OTHER (DESCRIBE)		
Equipment decontamination procedure:	<input checked="" type="checkbox"/> Per SOP7.01a <input type="checkbox"/> OTHER (DESCRIBE)		
Sample date: 9/16/10	Sample time: 1350		
Sample Identification Code: S-1-1 IL-SI-Compl-0910	Sample collection technique and if/how overlying water was removed: collected 3 subsamples at ANE 507 from body of catch basin and all present material along the CB rim of ANE 503		
Subsample number and location:	ANE 507 ANE 503 All material removed from catch basin rim 3 subsamples Front upstream center and rear downstream		
Color of sample:	very dark brown		
Texture/particle size:	70% fines, 15% sand, 15% coarse organics		
Visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.)	none		
Amount and type of debris in bulk sample:	leaves and large organic material, cans		
Amount and type of debris removed from final sample:	none		
Compositing notes: combined equal volumes of material from ANE 507 and ANE 503			
Sample jars collected (number, size, full or partial)? 4 - 4oz jars			
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order).			
Lab ID: FO105907	Duplicate sample collected? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Dupe ID		
Duplicate sample identification # on COC:			
Any deviations from standard procedures: None			

SECTION 3 - PHOTOGRAPH LOG

Overview of CB showing drainage area	
Catch basin plan view prior to sampling showing solids	
Lateral connections to/from CB	
Homogenized sample (sediment in bowl)	

SI-2



CITY OF PORTLAND ENVIRONMENTAL SERVICES

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



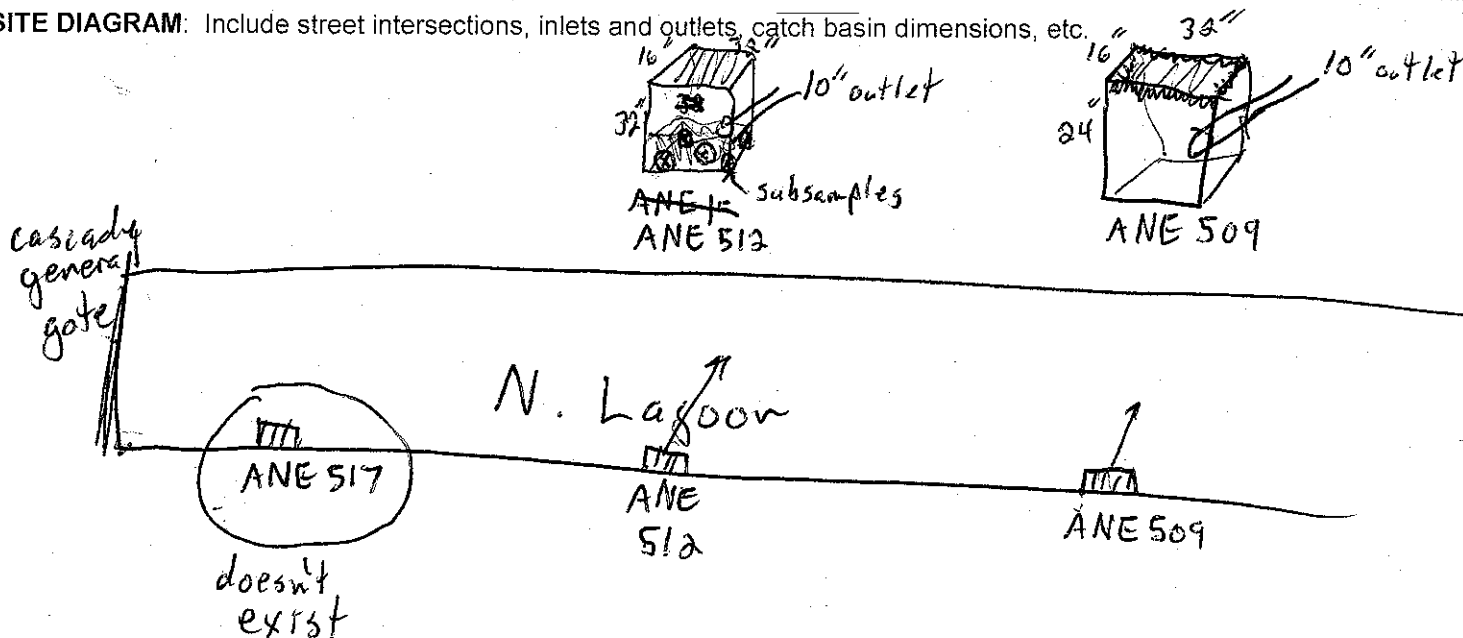
CATCH BASIN SOLIDS SAMPLING FIELD DATA SHEET

Project Name: PORTLAND HARBOR INLINE SAMP		Project Number: 1020.001
Sampling Team: MJS, CSK, PTR	Date: 9/16/10	Arrival Time: 1424
Basin: S-1	Node: ANE 509, ANE 512	Address: 5851 N. Lagoon
Current weather and last known rainfall: light rain currently, significant rain early this morning		

SECTION 1 - PRE-SAMPLING VISUAL OBSERVATION REPORT

Describe potential solids or contaminant sources that could impact catch basin (const. activities, erosion, vehicles, material storage, onsite processes, etc.):	heavy truck traffic none		
Describe debris and/or clogging around, or in catch basin grate/cover:	ANE 509 none	ANE 512 none	ANE 517 does not exist
Is there standing water in catch basin?	no		
Describe visual or olfactory observations of contamination at catch basin if any (odor, sheen, discoloration, etc.)	none		
Describe depth of sediments present in catch basin and the total depth of the catch basin or sump:	ANE 509 none in CB 1/4" along lip	ANE 512 6" deep	ANE 517 does not exist

SITE DIAGRAM: Include street intersections, inlets and outlets, catch basin dimensions, etc.



51-2

Date: 9/16/10		SECTION 2 - SAMPLE COLLECTION REPORT		Node: ANE 509 & ANE 512	
Sampling Equipment:		<input checked="" type="checkbox"/> Stainless steel spoon & stainless steel bucket <input type="checkbox"/> OTHER (DESCRIBE)			
Equipment decontamination procedure:		<input checked="" type="checkbox"/> Per SOP7.01a <input type="checkbox"/> OTHER (DESCRIBE)			
Sample date: 9/16/10		Sample time: 1429			
Sample Identification Code: 51-2 IL-SI-COMP2-0910		Sample collection technique and if/how overlying water was removed: ANE 509 - no material in CB so removed material from grate lip & walls ANE 512 - all material from grate lip and walls removed ANE 512 - 5 subsamples, 4 corners & center			
Subsample number and location:					
Color of sample:		dark brown			
Texture/particle size:		75% coarse organic material, 25% fines			
Visual or olfactory evidence of contamination in bulk sediment sample (odor, sheen, discoloration, etc.)		none			
Amount and type of debris in bulk sample:		abundant leaves & sticks from ANE 512, none in ANE 509			
Amount and type of debris removed from final sample:		none			
Compositing notes: combined equal volumes from ANE 509 and ANE 512. ANE 517 not located					
Sample jars collected (number, size, full or partial)? 4 - 4 oz jars					
If not enough sample to fill all of the jars, list jars collected and related analytes sampled (as per analyte priority list in work order). FO105908					
Lab ID		Duplicate sample collected? Y <input checked="" type="radio"/> N <input type="radio"/> Dupe ID			
Duplicate sample identification # on COC:					
Any deviations from standard procedures: None					

SECTION 3 - PHOTOGRAPH LOG	
Overview of CB showing drainage area	
Catch basin plan view prior to sampling showing solids	
Lateral connections to/from CB	
Homogenized sample (sediment in bowl)	

Stormwater Sampling

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Page 1 of

Project Portland Harbor

Project No.

Location Basin S1 - S1-SW1, S1-SW2, S1-SW3

Date 2/12/11

Subject Basin S1 stormwater

By MJS, CJK

1610: Radar indicates that rainfall is imminent in Portland area. Will collect samples using a fresh stainless steel beaker lowered on a string for each sample. Beakers have been decontaminated to reflect analytes.

1650: Light rain beginning to fall

1703: Rain intensifying - will go to site.

1727: On site at S1-SW2 to moderate steady rain and abundant runoff. There is heavy flow in the manhole.

1732 Collected sample from downstream end of MH AAM 127. Sample is moderately turbid.

1741: On site at S1-SW3 to continued steady rain and abundant runoff. Ample flow in manhole. Collected sample from downstream end of manhole AAM 133.

1750: on site at S1-SW1 - steady rain and abundant runoff. Abundant flow coming from both laterals.

Collected sample from downstream side of MH AAM 131 where the two laterals combine. Collected sample and duplicate from this location. Sample is moderately turbid with abundant suspended and floating material.

1803: completed sampling - off site



Collected By: CTK, JXB

Matrix: Stormwater

Basin S-1 Stormwater

~~Duplicate~~

Received By: _____
Signature: _____
Date: _____

Page _____ of _____



Page 1 of 1

Project Portland Harbor
Location Basin St: S1-SW1, S1-SW2, S1-SW3
Subject Basin St. Stormwater

Project No. _____
Date 3/23/11
By CJK, JXB

2000 rain gauge reading on Swan Island is 0.0" on all
3/23/11 readings

2100 rain gauge reading on Swan Island updates the 1700 hr
from 0.0" to 0.01" and the 1900 hr from 0.0" to 0.04"

2114 rain gauge reading on Swan Island updates the 2000 hr
from 0.0" to 0.16"

2115 Heading to site for sampling

2116 Heavy rain fall coming down consistently

2144 Arrived on Basin St. Heavy rain still falling

2145 Begin Sampling S1-SW2 at AAM127

Rain has backed off to a light sprinkle

Heavy flows in manhole and from perched laterals in manhole
photos taken.

2203 Begin Sampling S1-SW3 at AAM133

Rain has stopped.

Heavy flows still remain in manhole and in small perched lateral
sample collected from downstream end of MH.

2216 Begin Sampling S1-SW1 at AAM131

Still not raining

Heavy flows still remain in manhole

Both laterals with abundant flow

Sample collected from downstream side where both laterals
combine

* No Duplicate collected on this sampling effort as requested

2225 Completed Sampling event, headed for lab to relinquish
samples.

Attachments

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
Sample Custodian: (503) 823-5696
General Lab: (503) 823-5681



City of Portland
Chain-of-Custody



Bureau of Environmental Services

Date: 4/14/11

Work Order #: W111D150

Collected By: MJS, JJA

Client Name: Director's Office
Project Name: Portland Harbor

Matrix: Stormwater

Special Instructions:

Basin S-1 Stormwater (Revised 4/11/11)

Includes 1 & 2 Methylanthralene

Requested Analyses

Basin S-1 Stormwater (Revised 4/11/11)									
Includes 1 & 2 Methylnaphthalene									
Location ID	Sample Date	Sample Time	Sample Type	TSS	TOC	Totals Metals (Cu, Zn)	PAH + Phthalates ¹	PCB Aroclors (Low-level)	
S1_SW1	4/14/11	0920	G	•	•	•	•	•	
S1_SW3		0907	G	•	•	•	•	•	
S1_SW4		0859	G	•	•	•	•	•	
S1_SW5		0829	G	•	•	•	•	•	
S1_SW6		0846	G	•	•	•	•	•	
FIELDUP			G	•	•	•	•	•	
									</

Relinquished By:

Signature:

Printed Name:

Date: 4/14/11

Time: 0955

Received By:

Signature:

Printed Name:

Date: 4/14/11

Time: 0955

Relinquished By:

Signature:

Printed Name:

Date:

Time:

Received By:

Signature:

Printed Name:

Date:

Time:



Page 1 of 2

Project Portland Harbor Stormwater

Project No.

Location Basin S1 (S1-SW1, S1-SW3, S1-SW4, S1-SW5,

Date 4/14/11

Subject Event 3 S1-SW6)

By MJS, JCM

0748 - Heading to Basin S1 to collect samples. So far 0.38" is reported on Swan Island rain gauge, with bulk coming since 0400.

0824 - on site at S1-SW5 to steady moderate rain and abundant runoff. Abundant flow coming from both laterals.

0829 - collected sample from the 21" ^{line} lateral entering AAM137 from the northwest. Finished collecting sample at 0840.

0846 - on site at S1-SW6 to steady light rain and continued runoff. There is abundant flow in manhole. Collected sample from lateral entering AAM138 from the southwest. 0852 - completed sample collection.

0857 - on-site at S1-SW4. Rain has diminished but there is still substantial runoff. There is flow in main line as well as the two catch basin laterals and the lateral from the south. 0859 - collected sample from the south lateral entering AAM133 and a duplicate sample.

0907 - remained at AAM133 to collect sample for S1-SW3. collected sample downstream of the manhole capturing flow contributions from main line and all laterals. 0914 completed sample collection.

0920 - on site at S1-SW1. Rain has stopped but run-off is continuing. Manhole has substantial flow from



Page 2 of 2

Project Portland Harbor stormwater
Location Basin 51
Subject Event 3

Project No. —
Date 4/14/11
By MJS, JJM

both lines. Collected sample from down stream
end of AAM131. 0925 - completed sample collection.

Attachments



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



Date: 4/28/11
Work Order #: W11D257

Collected By: MJS

Client Name: _____
Director's Office _____
Project Name: Portland Harbor

Matrix: Stormwater

Special Instructions:

Basin S-1 Stormwater (Revised 4/11/11)

Includes 1 & 2 Methylanthralene

Requested Analyses

Lab Num	Location ID	Sample Date	Sample Time	Sample Type	TSS	TOC	Totals Metals (Cu, Zn)	PAH + Phthalates ¹	PCB Aroclors (Low-level)	# of Containers	Remarks
01	S1_SW1	4/28/11	1650	G	•	•	•	•	•		AAM131 Downstream of manhole
02	S1_SW3		1637	G	•	•	•	•	•		AAM133 Downstream of manhole
03	S1_SW4		1626	G	•	•	•	•	•		AAM133 Upstream 15" lateral
04	S1_SW5		1553	G	•	•	•	•	•		AAM127 Upstream 21" main
05	S1_SW6		1614	G	•	•	•	•	•		AAM138 Upstream in lateral from SW
	FIELD DUP				•	•	•	•	•		Field Duplicate

* Note: The samples were stored in sample receiving refrigerator overnight.

Relinquished By:

Signature:

Printed Name: Matt Salinas Date: 4/28/11 Time: 1744

Received By:

Signature:

Printed Name: Rona Knech Date: 4/29/11 Time: 0810

Relinquished By:

Signature:

Printed Name: _____ Date: _____ Time: _____

Received By:

Signature:

Printed Name: _____ Date: _____ Time: _____



Page 1 of 2

Project Portland Harbor Stormwater

Project No. —

Location Basin S1

Date 4/28/11

Subject S1-SW5, S1-SW6, S1-SW4, S1-SW3, S1-SW1

By MJS

1502 - On-site at Basin S1 to light but steady rain. Rain gauges have not yet updated to display rainfall between 1400 and 1500, but rainfall from 1300-1400 was 0.03". Verified that all sites are flowing, but some are not flowing very heavily.

1516 - Rain gauges have updated, and an additional 0.03" fell between 1400 and 1500. Will wait for additional rain, as ~~fast~~^{new} radar indicates that rainfall may be intensifying.

1541 - rain is intensifying and runoff is abundant currently. Spoke w/ LAS + get go ahead to sample.

1553 - On site at S1-SW5 to moderate rainfall and abundant flow from 21" lateral line from the Northwest and other 2 laterals. Collected sample from 21" line entering AAM 127 from the Northwest, using a beaker mounted on a pole. 1609 - completed sampling at S1-SW5.

1614 - On-site at S1-SW6 to light rain and abundant flow in manhole. Collected sample from lateral entering manhole AAM 138 from the southwest. Sample is moderately turbid. 1622 - completed sampling at S1-SW6.

Attachments



Page 2 of 2

Project Portland Harbor stormwater

Project No. -

Location Basin 51

Date 4/28/11

Subject

By MSS

1626 - On site at 51-SW4 to continued light rain and flow entering manhole from ~~all~~ all laterals.

Collected sample from 15" lateral entering AAM133 from the south. Sample is very turbid and has a visible sheen. 1636 completed sampling at 51-SW4.

1637 - collecting sample 51-SW3 from same manhole AAM133 from downstream of the manhole. Sample is moderately turbid.

1646 - completed sampling.

1650 - on site at 51-SW1. Rain has stopped but there is still abundant runoff from both pipes entering manhole AAM131. Collected sample from outlet of manhole. Sample is moderately turbid. 1659 completed sampling at 51-SW1.

Attachments

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
Sample Custodian: (503) 823-5696
General Lab: (503) 823-5681



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



Date: 5/14/11

Work Order #: W11E103

Collected By: MJS, AJA

Client Name: Director's Office
Project Name: Portland Harbor

Matrix: Stormwater

Special Instructions:

Basin S-1 Stormwater (Revised 4/11/11)

Includes 1 & 2 Methylanthalene

Requested Analyses

Special Instructions:				
Basin S-1 Stormwater (Revised 4/11/11)				
Includes 1 & 2 Methyl-naphthalene				
Lab Number	Location ID	Sample Date	Sample Time	Sample Type
01	S1_SW1	5/11/11	1826	G
02	S1_SW3		1815	G
03	S1_SW4		1802	G
04	S1_SW5		1735	G
05	S1_SW6		1750	G
06	FIELD DUP			G

Relinquished By:

Signature:

Printed Name:

Date: 5/12/11

Time: 0836

Received By:

Signature:

Printed Name:

Date: 5/12/11

Time: 0836

Relinquished By:

Signature:

Printed Name:

Received By:

Signature:

Printed Name:

Date:

Time:



Page 1 of 1

Project Portland Harbor
Location Basin 51
Subject Event 3

Project No. _____
Date 5/11/11
By MJS, AJA

5/11/11

1707: Rain has been falling since ~ 1330, although rain gauges have not updated since 1507, at which time 0.06" had fallen. Rainfall has been much more intense since ~ 1630, and radar indicates intense rainfall continuing. Will head to site.

1728: on-site at SI-SW5 for steady moderately heavy rain and abundant runoff. Collected sample from 21" lateral upstream of AAM127 at 1735.

1748: on-site at SI-SW6 to continued steady rain and abundant runoff. Collected sample from lateral entering manhole AAM138 from the southwest at 1750.

1755: on-site at manhole AAM133 to diminishing rain, but still heavy runoff.

Collected sample from SI-SW4 and duplicate from 15" lateral entering AAM133 from the south at 1802.

Collected ~~the~~ sample SI-SW3 from downstream line exiting AAM133 at 1815.

1820: on-site at ~~manhole~~ site SI-SW1. Rainfall has ended but there is still significant runoff. Collected sample from outlet of manhole AAM131 at 1826.

1906 - samples stored in Field operations refrigerator to be submitted to lab ~~AM~~ in the morning.

Attachment C
Laboratory Results and QA/QC Review

Sediment Trap Investigation

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

Laboratory Data QA/QC Review Inline Solids Investigation City Outfall Basin S-1

To: File
From: Karen Demsey, GSI Water Solutions, Inc.
Date: September 21, 2010

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated from source control investigation sampling and analyses conducted by the City of Portland (City) in June 2010. One solids sample (F0105679) from a sediment trap sample installed in Outfall Basin S-1 was collected on June 15, 2010, and submitted for analyses.

The laboratory analyses for this solids sample were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontracted laboratory. The following laboratories conducted the analyses listed below:

- BES WPCL
 - Total solids (TSS) – SM 2540G
- Test America (TA)
 - Organotin Compounds – PSEP GC/MS

The WPCL summary report and the subcontracted laboratory's data report are attached for all analyses associated with this source control program sample. The WPCL summary report comments that 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.

The following QA/QC review of the analytical data is based on the available documentation provided by the subcontracted laboratory and on exceptions noted in the WPCL summary report. The QA/QC review of the analytical data consisted of reviewing the following elements for each laboratory report, if applicable and/or available:

- 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
- Internal standard recoveries within accuracy control limits
- Matrix spike and matrix spike duplicate (MS/MSD) sample results within control limits
- Laboratory control (LC) sample recoveries within control limits

The results from the QA/QC review of the available information in the laboratory reports are presented below.

Chain-of-Custody

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

Analysis Holding Times

The sample was extracted and analyzed within the recommended method-specific holding times for all analyses.

Method Blanks

A method blank was analyzed during the laboratory analysis of organotin compounds. No analytes were detected in the method blank.

Surrogate Recoveries

Surrogate recoveries were completed during the analysis of organotin compounds. Surrogate recoveries were within the method-specified control limits for the field sample and all QA/QC analyses.

Matrix Spike/Matrix Spike Duplicates

MS/MSD samples were processed during the laboratory analysis of organotin compounds. The MS percent recoveries were outside control criteria for all spiked analytes except monobutyltin, and the relative percent differences (RPD) between the MS and MSD samples were outside of control criteria for tetra-n-butyltin and dibutyltin. The WPCL summary report notes that the inconsistent MS/MSD recoveries indicate non-homogeneous matrix and/or matrix interferences, and states that the results should be considered estimates.

Laboratory Control Samples

LC samples were processed during the laboratory analysis of organotin compounds. The LC sample recoveries and relative percent differences were within laboratory control limits.

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: 6/15/2010
Page: 1 of 1
Collected By: MJS, PTB

Project Name: PORTLAND HARBOR STORMWATER SAMP

File Number: 1020.005

Matrix: SEDIMENT

Requested Analyses

Basin S-1 Sediment Trap Chain-of-custody

Sediment traps installed: 2/19/10

Sediment traps removed: 6/15/10

* 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.

WPCL Sample I.D.

Location

Point Code Sample Date Sample Time Sample Type

FO105679

ST-S1-AAM127-0610
NLAGOON AT VIGOR GATE

S1-ST1 6/15/10 1515 C

PCB Congeners (All 209)

PCB Aroclors (Low-level)

Organotins

Grain Size

TOC

TS*

Total Metals (As, Cd Cr,
Cu, Pb, Ni, Ag, Zn) + Hg

Comments

Analysis added per P114-6/18/10

TS = 33.9% 56.1 g Total Wet Weight

Relinquished By: 1.

Signature: [Signature] Time: 1626

Printed Name: Peter Bryant Date: 6/15/10

Received By: [Signature] Time: [Signature]

Signature: [Signature] Date: 6/15/10

Printed Name: [Signature] Date: 6/15/10

Relinquished By: 2.

Signature: [Signature] Time: [Signature]

Printed Name: [Signature] Date: [Signature]

Received By: 2. Signature: [Signature]

Signature: [Signature] Time: [Signature]

Printed Name: [Signature] Date: [Signature]

Relinquished By: 3.

Signature: [Signature] Time: [Signature]

Printed Name: [Signature] Date: [Signature]

Received By: 3. Signature: [Signature]

Signature: [Signature] Time: [Signature]

Printed Name: [Signature] Date: [Signature]

Relinquished By: 4.

Signature: [Signature] Time: [Signature]

Printed Name: [Signature] Date: [Signature]

Received By: 4. Signature: [Signature]

Signature: [Signature] Time: [Signature]

Printed Name: [Signature] Date: [Signature]



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: FO105679

Sample Collected: 6/15/2010 15:15
Sample Received: 06/15/10

Sample Status: COMPLETE AND
VALIDATED

Proj./Company Name: PORTLAND HARBOR STORMWATER SAMP
Address/Location: ST-S1-AAM127-0610
N LAGOON NEAR INDUSTRY GATE
Sample Point Code: S1_ST1
Sample Type: COMPOSITE
Sample Matrix: SEDIMENT

Report Page: Page 1 of 1

System ID: AO05536
EID File # : 1020.005
LocCode: PORTHASW
Collected By: MJS/PTB

Comments:

QA/QC: Except as follows, 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. Inconsistent MS/MSD recoveries for Organotins indicate non-homogeneous matrix and/or matrix interferences; results should be considered estimates.

Test Parameter	Result	Units	MRL	Method	Analysis Date
GENERAL					
TOTAL SOLIDS	33.9	% W/W	0.01	SM 2540 G	06/16/10
OUTSIDE ANALYSIS					
ORGANOTIN COMPOUNDS - TA					
Dibutyl tin	380	µg/Kg dry wt	3.9	PSEP GC/MS	06/24/10
Monobutyl tin	140	µg/Kg dry wt	3.9	PSEP GC/MS	06/24/10
Tetrabutyl tin	<11	µg/Kg dry wt	11	PSEP GC/MS	06/24/10
Tributyl tin	580	µg/Kg dry wt	3.9	PSEP GC/MS	06/24/10

End of Report for Sample ID: FO105679

July 20, 2010

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 06/21/10 14:20.
The following list is a summary of the Work Orders contained in this report, generated on 07/20/10 15:41.

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

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
PTF0636	Portland Harbor	Stormwater (Basin S-1)

TestAmerica Portland



Darrell Auvil, Project Manager

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

City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

Stormwater (Basin S-1)

Project Manager:

Jennifer Shackelford

Report Created:

07/20/10 15:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
F0105679	PTF0636-01	Soil	06/15/10 15:15	06/21/10 14:20

TestAmerica Portland



Darrell Auvil, 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:

Stormwater (Basin S-1)

Project Manager:

Jennifer Shackelford

Report Created:

07/20/10 15:41

Organotins, PSEP (GC/MS)

TestAmerica Seattle

Analyte	Method	Result	MDL *	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTF0636-01 (F0105679)				Soil			Sampled: 06/15/10 15:15			
Dibutyltin	Organotins Dry	380	-----	3.9	ug/Kg dry	1x	66298	06/24/10 10:28	06/24/10 22:59	
Monobutyltin	"	140	-----	3.9	"	"	"	"	"	
Tetra-n-butyltin	"	ND	-----	11	"	"	"	"	"	
Tributyltin	"	580	-----	3.9	"	"	"	"	"	
<hr/>										
<i>Surrogate(s): Tripentyltin</i>				<i>101%</i>		<i>42 - 192 %</i>	<i>"</i>			<i>"</i>

TestAmerica Portland



Darrell Auvil, 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:

Stormwater (Basin S-1)

Project Manager:

Jennifer Shackelford

Report Created:

07/20/10 15:41

Percent Moisture
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTF0636-01 (F0105679)			Soil			Sampled: 06/15/10 15:15				
Percent Moisture	Moisture	66	-----	0.10	%	1x	67211	07/06/10 19:08	07/06/10 19:08	
Percent Solids	"	34	-----	0.10	"	"	"	"	"	

TestAmerica Portland



Darrell Auvil, Project Manager

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

City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **Portland Harbor**
Project Number: Stormwater (Basin S-1)
Project Manager: Jennifer Shackelford

Report Created:
07/20/10 15:41

Organotins, PSEP (GC/MS) - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 66298

Soil Preparation Method: Organotin Prep

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
---------	--------	--------	------	-----	-------	-----	---------------	-----------	-------	----------	-------	----------	----------	-------

Matrix Spike Dup (200911D)

QC Source: PTF0636-01

Extracted: 06/24/10 10:28

Monobutyltin	Organotins Dry	417	---	5.3	ug/Kg dry	1x	140	331	84%	(21-99)	26%	(36)	06/24/10 22:39	
Tetra-n-butyltin	"	510	---	14	"	"	ND	531	96%	(42-124)	32%	(25)	"	F
Tributyltin	"	964	---	5.3	"	"	580	473	81%	(29-110)	25%	(28)	"	
Dibutyltin	"	671	---	5.3	"	"	380	407	71%	(32-114)	54%	(30)	"	F
Surrogate(s): Tripentyltin		Recovery: 129%		Limits: 42-192%	"								06/24/10 22:39	

Matrix Spike (200911S)

QC Source: PTF0636-01

Extracted: 06/24/10 10:28

Tributyltin	Organotins Dry	1240	---	5.3	ug/Kg dry	1x	580	473	138%	(29-110)	--	--	06/24/10 22:18	F
Dibutyltin	"	1170	---	5.3	"	"	380	407	194%	(32-114)	--	--	"	F
Monobutyltin	"	322	---	5.3	"	"	140	331	55%	(21-99)	--	--	"	
Tetra-n-butyltin	"	702	---	14	"	"	ND	530	132%	(42-124)	--	--	"	F
Surrogate(s): Tripentyltin		Recovery: 99%		Limits: 42-192%	"								06/24/10 22:18	

LCS (580-66367-10)

QC Source:

Extracted: 06/24/10 10:28

Monobutyltin	Organotins Dry	114	---	1.3	ug/Kg dry	1x	--	166	69%	(21-99)	--	--	06/24/10 21:56	
Tetra-n-butyltin	"	244	---	3.6	"	"	--	267	91%	(42-124)	--	--	"	
Tributyltin	"	143	---	1.3	"	"	--	238	60%	(29-110)	--	--	"	
Dibutyltin	"	118	---	1.3	"	"	--	204	58%	(32-114)	--	--	"	
Surrogate(s): Tripentyltin		Recovery: 77%		Limits: 42-192%	"								06/24/10 21:56	

Blank (580-66367-9)

QC Source:

Extracted: 06/24/10 10:28

Dibutyltin	Organotins Dry	ND	---	1.3	ug/Kg dry	1x	--	--	--	--	--	--	06/24/10 21:35	
Monobutyltin	"	ND	---	1.3	"	"	--	--	--	--	--	--	"	
Tetra-n-butyltin	"	ND	---	3.6	"	"	--	--	--	--	--	--	"	
Tributyltin	"	ND	---	1.3	"	"	--	--	--	--	--	--	"	
Surrogate(s): Tripentyltin		Recovery: 114%		Limits: 42-192%	"								06/24/10 21:35	

TestAmerica Portland



Darrell Auvil, Project Manager

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

City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

Portland Harbor

Project Number:

Stormwater (Basin S-1)

Project Manager:

Jennifer Shackelford

Report Created:

07/20/10 15:41

Notes and Definitions

Report Specific Notes:

F - MS or MSD exceeds the control limits

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



Darrell Auvil, Project Manager

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

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244
11922 E. First Ave, Spokane, WA 99206-5302
9405 SW Nimbus Ave, Beaverton, OR 97008-7145
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119

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

CHAIN OF CUSTODY REPORT

Work Order #: **PFFedeele**

CLIENT: City of Portland		INVOICE TO: Charles Lytle		TURNAROUND REQUEST	
REPORT TO: Jennifer Shackelford		PRESERVATIVE		in Business Days *	
ADDRESS:		P.O. NUMBER:		Organic & Inorganic Analyses	
PHONE:		FAX:		7 5 4 3 2 1 <1	
PROJECT NAME: Portland Harbor		REQUESTED ANALYSES		Petroleum Hydrocarbon Analyses	
PROJECT NUMBER: Stormwater Samp				5 4 3 2 1 <1	
SAMPLED BY: (Basin S-1)				STD.	
CLIENT SAMPLE IDENTIFICATION		SAMPLING DATE/TIME		OTHER Specify:	
1. F0105679 6/15/10 1515		X		* Turnaround Requests less than standard may incur Rush Charges.	
2.				MATRIX (W, S, O)	
3.				# OF CONT.	
4.				LOCATION/ COMMENTS	
5.				TA	
6.				WO ID	
7.				0 1 Total Solids =	
8.				33.9%	
9.					
10.					
RELEASED BY: Shackelford		DATE: 6/21/10		DATE: 6/21/10	
PRINT NAME: Shackelford		FIRM: City of Portland		FIRM: TAP	
RELEASED BY: Shackelford		DATE: 6/21/10		DATE: 6/21/10	
PRINT NAME: Shackelford		FIRM: TAP		FIRM: TAP	
ADDITIONAL REMARKS: Please use given TS results due to limited sample volume - to				PAGE 39 OF	

TestAmerica Portland
Sample Receiving Checklist

Work Order #: PTF0636 Date/Time Received: 6/21/10 1420
Client Name and Project: COP

Time Zone:
☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☒ PDT/PST ☐ AK ☐ OTHER

Unpacking Checks:

Cooler #(s): 29
Temperatures: 29
Digi #1 ☐ Digi #2 ☐ IR Gun ☒ (☒ Plastic ☐ Glass)

Temperature out of Range:

☐ Not enough or No Ice
☐ Ice Melted
☐ W/in 4 Hrs of collection
☐ Other:

N/A Yes No

Initials dm

- | | | | |
|-------------------------------------|-------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1. If ESI client, were temp blanks received? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2. Cooler Seals intact? (N/A if hand delivered) if no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3. Chain of Custody present? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4. Bottles received intact? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5. Sample is not multiphasic? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6. Proper Container and preservatives used? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7. pH of all samples checked and meet requirements? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8. Cyanide samples checked for sulfides and meet requirements? If no, notify PM. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9. HF Dilution required? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 10. Sufficient volume provided for all analysis? If no, document on NOD and consult PM before proceeding. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 11. Did chain of custody agree with samples received? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 12. Is the "Sampled by" section of the COC completed? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13. Were VOA/Oil Syringe samples without headspace? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 14. Were VOA vials preserved? <input type="checkbox"/> HCl <input type="checkbox"/> Sodium Thiosulfate <input type="checkbox"/> Ascorbic Acid |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 15. Did samples require preservation with sodium thiosulfate? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 16. If yes to #15, was the residual chlorine test negative? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 17. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 18. Is sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM before proceeding. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 19. Are analyses with short holding times received in hold? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 20. Was Standard Turn Around (TAT) requested? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 21. Receipt date(s) < 48 hours past the collection date(s)? If no, notify PM. |

TestAmerica Portland
Sample Receiving Checklist

Work Order #: PTF0636

Login Checks:

Initials: jm

N/A Yes No

- | | | | |
|-------------------------------------|-------------------------------------|--------------------------|---|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 22. Sufficient volume provided for all analysis? If no, document on NOD & contact PM. |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 23. Sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM. |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 24. Did the chain of custody include "received by" and "relinquished by" signatures, dates and times? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 25. Were special log in instructions read and followed? |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 26. Were tests logged checked against the COC? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 27. Were rush notices printed and delivered? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 28. Were short hold notices printed and delivered? |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 29. Were subcontract COCs printed? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 30. Was HF dilution logged? |

Labeling and Storage Checks:

Initials: jm

N/A Yes No

- | | | | |
|-------------------------------------|-------------------------------------|--------------------------|---|
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 31. Were the subcontracted samples/containers put in Sx fridge? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 32. Were sample bottles and COC double checked for dissolved/filtered metals? |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 33. Did the sample ID, Date, and Time from label match what was logged? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 34. Were Foreign sample stickers affixed to each container and containers stored in foreign fridge? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 35. Were HF stickers affixed to each container, and containers stored in Sx fridge? |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 36. Was an NOD for created for noted discrepancies and placed in folder? |

Document any problems or discrepancies and the actions taken to resolve them on a Notice of Discrepancy form (NOD).

Catch Basin Investigation

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

Laboratory Data QA/QC Review Inline Solids Investigation City Outfall Basin S-1

To: File
From: Andrew Davidson, GSI Water Solutions, Inc. (GSI)
Date: November 11, 2010

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated from a source control investigation sampling event conducted by the City of Portland (City) in September 2010. Two composite solids samples (FO105907 and FO105908) were collected from catch basins in City Outfall Basin S-1 on September 16, 2010.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and subcontracted laboratories. The following laboratories conducted the analyses listed:

- BES WPCL
 - Total Solids – SM 2540G
- Test America (TA)
 - Organotin Compounds – PSEP GC/MS
 - Total Organic Carbon (TOC) – EPA 9060 MOD

The WPCL summary report and the subcontracted laboratory's data reports for all analyses associated with this sampling event are attached. The WPCL summary report comments that unless otherwise noted, all analytical QA/QC criteria were met for these samples including holding times, calibration, method blanks, laboratory control sample recoveries, duplicate precision, matrix spike recoveries, and surrogate recoveries, as applicable.

The following QA/QC review of the analytical data is based on the available documentation provided by the subcontracted laboratories and on exceptions noted in the WPCL summary report. The QA/QC review of the analytical data consisted of reviewing the following elements for each laboratory report, if applicable and/or available:

- Chain-of-custody – for completeness and continuous custody

- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate recoveries within laboratory control limits
- Matrix spike and matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control and duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits

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

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

Samples for all analyses were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the subcontracted laboratory analyses of organotins and TOC. No analytes were detected in the method blanks for either analysis.

Surrogate Recoveries

Surrogate recoveries were completed during the analysis of organotin compounds. Surrogate recoveries were within the method-specified control limits for the field sample and all QC samples.

Matrix Spike/Matrix Spike Duplicate

MS/MSD samples were processed during the subcontracted analyses of organotin compounds and TOC. MS/MSD sample recoveries and relative percent differences (RPDs) are within method-specified control limits for the organotin analysis. The MS sample recovery for the TOC analysis is below method-specified control limits. However, the associated MSD sample recovery is within control criteria.

Laboratory Control Samples

LC samples were processed during the analyses of organotins and TOC. All LC sample recoveries were within method-specified control limits.



City of Portland
Chain of Custody
Bureau of Environmental Services



Date: 9/16/10
Page: 1 of 1
Collected By: CSK, MSS, PTB

Project Name: **PORTLAND HARBOR INLINE SAMP**

File Number: 1020.001

Matrix: SEDIMENT

Basin ~~19A~~ inline

S1 ~~19A~~

Organics

General

Requested Analyses

Field Comments

WPCL Sample I.D.

FO105907

FO105908

Location

Point Code Sample Date Sample Time Sample Type

Organotins
TOC

Total Solids

IL-S1-COMP1-0910

5651 N LAGOON CDS
ANES07 & ANES08

S1-1

9/16/10

1350

C

IL-S1-COMP2-0910

5651 N LAGOON CDS
ANES09 & ANES12

S1-2

9/16/10

1429

C

Relinquished By: 1

Signature: [Signature] Time: 1547

Printed Name: Peter Bryant Date: 9/16/10

Received By: 1

Signature: [Signature] Time: 1547

Printed Name: Rona Klued Date: 9/16/10

Relinquished By: 2

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Received By: 2

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Relinquished By: 3

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Received By: 3

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Relinquished By: 4

Signature: _____ Time: _____

Printed Name: _____ Date: _____

Received By: 4

Signature: _____ Time: _____

Printed Name: _____ Date: _____



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: **FO105907** Sample Collected: 9/16/2010 13:50 Sample Status: **COMPLETE AND VALIDATED**
Sample Received: 09/16/10

Proj./Company Name: PORTLAND HARBOR INLINE SAMP Report Page: Page 1 of 1
Address/Location: IL-S1-CBCOMP1-0910
5851 N LAGOON AVE CBs ANE507 & ANE503
Sample Point Code: S1_1 System ID: AO08238
Sample Type: COMPOSITE EID File #: 1020.001
Sample Matrix: SEDIMENT LocCode: PORTHARI
Collected By: MJS/PTB

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	56	% W/W	0.01	SM 2540 G	09/26/10
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	120000	mg/Kg dry wt	2000	EPA 9060 MOD	09/30/10
ORGANOTIN COMPOUNDS - TA					
Dibutyl tin	140	µg/Kg dry wt	2.30	PSEP GC/MS	09/28/10
Monobutyl tin	69	µg/Kg dry wt	2.30	PSEP GC/MS	09/28/10
Tetrabutyl tin	<6.4	µg/Kg dry wt	6.4	PSEP GC/MS	09/28/10
Tributyl tin	150	µg/Kg dry wt	2.30	PSEP GC/MS	09/28/10

End of Report for Sample ID: FO105907



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: **FO105908** Sample Collected: 9/16/2010 14:29 Sample Status: **COMPLETE AND VALIDATED**
Sample Received: 09/16/10

Proj./Company Name: PORTLAND HARBOR INLINE SAMP Report Page: Page 1 of 1
Address/Location: IL-S1-CBCOMP2-0910
5851 N LAGOON AVE CBs ANE509 & ANE512
Sample Point Code: S1_2 System ID: AO08239
Sample Type: COMPOSITE EID File #: 1020.001
Sample Matrix: SEDIMENT LocCode: PORTHARI
Collected By: MJS/PTB

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	39	% W/W	0.01	SM 2540 G	09/26/10
OUTSIDE ANALYSIS					
TOTAL ORGANIC CARBON	200000	mg/Kg dry wt	2000	EPA 9060 MOD	09/30/10
ORGANOTIN COMPOUNDS - TA					
Dibutyl tin	71	µg/Kg dry wt	3.30	PSEP GC/MS	09/28/10
Monobutyl tin	49	µg/Kg dry wt	3.30	PSEP GC/MS	09/28/10
Tetrabutyl tin	<9.1	µg/Kg dry wt	9.1	PSEP GC/MS	09/28/10
Tributyl tin	66	µg/Kg dry wt	3.30	PSEP GC/MS	09/28/10

End of Report for Sample ID: FO105908

November 16, 2010

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


RE: General 2010-2013

Enclosed are the results of analyses for samples received by the laboratory on 09/17/10 13:20.
The following list is a summary of the Work Orders contained in this report, generated on 11/16/10 08:27.

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

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
PTI0587	General 2010-2013	Basin S-1

TestAmerica Portland



Darrell Auvil, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

General 2010-2013

Project Number:

Basin S-1

Project Manager:

Jennifer Shackelford

Report Created:

11/16/10 08:27

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FO105907	PTI0587-01	Soil	09/16/10 13:50	09/17/10 13:20
FO105908	PTI0587-02	Soil	09/16/10 14:29	09/17/10 13:20

TestAmerica Portland



Darrell Auvil, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **General 2010-2013**
Project Number: **Basin S-1**
Project Manager: **Jennifer Shackelford**

Report Created:
11/16/10 08:27

Organic Carbon, Total (TOC)
TestAmerica Seattle

Analyte	Method	Result	MDL *	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTI0587-01 (FO105907)										
			Soil				Sampled: 09/16/10 13:50			
Total Organic Carbon	9060	120000	-----	2000	mg/Kg	1x	72728	09/30/10 10:54	09/30/10 10:54	
PTI0587-02 (FO105908)										
			Soil				Sampled: 09/16/10 14:29			
Total Organic Carbon	9060	200000	-----	2000	mg/Kg	1x	72728	09/30/10 12:36	09/30/10 12:36	

TestAmerica Portland



Darrell Auvil, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **General 2010-2013**
Project Number: **Basin S-1**
Project Manager: **Jennifer Shackelford**

Report Created:
11/16/10 08:27

Organotins, PSEP (GC/MS)
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTI0587-01 (FO105907)				Soil			Sampled: 09/16/10 13:50			
Dibutyltin	Organotins Dry	140	----	2.3	ug/Kg dry	1x	72667	09/28/10 09:41	10/01/10 20:39	
Monobutyltin	"	69	----	2.3	"	"	"	"	"	
Tetra-n-butyltin	"	ND	----	6.4	"	"	"	"	"	
Tributyltin	"	150	----	2.3	"	"	"	"	"	
<i>Surrogate(s): Tripentyltin</i>				69%		20 - 151 %	"			"
PTI0587-02 (FO105908)				Soil			Sampled: 09/16/10 14:29			
Dibutyltin	Organotins Dry	71	----	3.3	ug/Kg dry	1x	72667	09/28/10 09:41	10/01/10 21:00	
Monobutyltin	"	49	----	3.3	"	"	"	"	"	
Tetra-n-butyltin	"	ND	----	9.1	"	"	"	"	"	
Tributyltin	"	66	----	3.3	"	"	"	"	"	
<i>Surrogate(s): Tripentyltin</i>				80%		20 - 151 %	"			"

TestAmerica Portland



Darrell Auvil, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203


Project Name: **General 2010-2013**
Project Number: **Basin S-1**
Project Manager: **Jennifer Shackelford**

Report Created:
11/16/10 08:27

Percent Moisture
TestAmerica Seattle

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
PTI0587-01 (FO105907)		Soil		Sampled: 09/16/10 13:50						
Percent Moisture	Moisture	44	-----	0.10	%	1x	72329	09/26/10 11:02	09/26/10 11:02	
Percent Solids	"	56	-----	0.10	"	"	"	"	"	
PTI0587-02 (FO105908)		Soil		Sampled: 09/16/10 14:29						
Percent Moisture	Moisture	61	-----	0.10	%	1x	72329	09/26/10 11:02	09/26/10 11:02	
Percent Solids	"	39	-----	0.10	"	"	"	"	"	

TestAmerica Portland



Darrell Auvil, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **General 2010-2013**
Project Number: **Basin S-1**
Project Manager: **Jennifer Shackelford**

Report Created:
11/16/10 08:27

Organic Carbon, Total (TOC) - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 72728

Soil Preparation Method: NA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Matrix Spike (217751S)			QC Source: PTI0587-01					Extracted: 09/30/10 12:12						
Total Organic Carbon	9060	139000	---	2000	mg/Kg	1x	120000	95200	17%	(76-128)	--	--	09/30/10 12:12	F
Duplicate (217751X)			QC Source: PTI0587-01					Extracted: 09/30/10 11:25						
Total Organic Carbon	9060	120000	---	2000	mg/Kg	1x	120000	--	--	--	2%	(50)	09/30/10 11:25	
Blank (580-72728-3)			QC Source:					Extracted: 09/30/10 09:30						
Total Organic Carbon	9060	ND	---	2000	mg/Kg	1x	--	--	--	--	--	--	09/30/10 09:30	
LCS (580-72728-4)			QC Source:					Extracted: 09/30/10 09:54						
Total Organic Carbon	9060	3900	---	2000	mg/Kg	1x	--	2720	143%	(34-166)	--	--	09/30/10 09:54	

TestAmerica Portland



Darrell Auvil, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **General 2010-2013**

Project Number: Basin S-1

Project Manager: Jennifer Shackelford

Report Created:

11/16/10 08:27

Organotins, PSEP (GC/MS) - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 72667

Soil Preparation Method: Organotin Prep

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
LCS (580-72667-10)		QC Source:						Extracted: 09/28/10 09:41						
Dibutyltin	Organotins Dry	76.5	---	1.3	ug/Kg dry	1x	--	102	75%	(25-142)	--	--	10/01/10 20:18	
Monobutyltin	"	55.8	---	1.3	"	"	--	83.1	67%	(24-125)	--	--	"	
Tetra-n-butyltin	"	92.0	---	3.6	"	"	--	133	69%	(26-149)	--	--	"	
Tributyltin	"	72.9	---	1.3	"	"	--	119	61%	(20-146)	--	--	"	
Surrogate(s): Tripentyltin		Recovery:	118%	Limits: 20-151%		"		10/01/10 20:18						
Matrix Spike (580-72667-14)		QC Source: 580-72667-13						Extracted: 09/28/10 09:41						
Dibutyltin	Organotins Dry	59.1	---	1.4	ug/Kg dry	1x	ND	108	55%	(25-142)	--	--	10/01/10 21:43	
Monobutyltin	"	54.7	---	1.4	"	"	ND	87.9	62%	(24-125)	--	--	"	
Tetra-n-butyltin	"	73.1	---	3.8	"	"	ND	141	52%	(26-149)	--	--	"	
Tributyltin	"	77.3	---	1.4	"	"	ND	126	62%	(20-146)	--	--	"	
Surrogate(s): Tripentyltin		Recovery:	87%	Limits: 20-151%		"		10/01/10 21:43						
Matrix Spike Dup (580-72667-15)		QC Source: 580-72667-13						Extracted: 09/28/10 09:41						
Monobutyltin	Organotins Dry	49.1	---	1.4	ug/Kg dry	1x	ND	87.8	56%	(24-125)	11%	(36)	10/01/10 22:04	
Tetra-n-butyltin	"	84.1	---	3.8	"	"	ND	141	60%	(26-149)	14%	(25)	"	
Tributyltin	"	70.9	---	1.4	"	"	ND	126	56%	(20-146)	9%	(28)	"	
Dibutyltin	"	57.7	---	1.4	"	"	ND	108	53%	(25-142)	2%	(30)	"	
Surrogate(s): Tripentyltin		Recovery:	100%	Limits: 20-151%		"		10/01/10 22:04						
Blank (580-72667-9)		QC Source:						Extracted: 09/28/10 09:41						
Dibutyltin	Organotins Dry	ND	---	1.3	ug/Kg dry	1x	--	--	--	--	--	--	10/01/10 19:57	
Monobutyltin	"	ND	---	1.3	"	"	--	--	--	--	--	--	"	
Tetra-n-butyltin	"	ND	---	3.6	"	"	--	--	--	--	--	--	"	
Tributyltin	"	ND	---	1.3	"	"	--	--	--	--	--	--	"	
Surrogate(s): Tripentyltin		Recovery:	108%	Limits: 20-151%		"		10/01/10 19:57						

TestAmerica Portland



Darrell Auvil, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name:

General 2010-2013

Project Number:

Basin S-1

Project Manager:

Jennifer Shackelford

Report Created:

11/16/10 08:27

Percent Moisture - Laboratory Quality Control Results

TestAmerica Seattle

QC Batch: 72329

Soil Preparation Method: NA

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
Duplicate (580-72329-2)			QC Source: 580-72329-1					Extracted: 09/26/10 11:02						
Percent Moisture	Moisture	5.4	---	0.10	%	1x	6.3	--	--	--	16%	(20)	09/26/10 11:02	
Percent Solids	"	95	---	0.10	"	"	94	--	--	--	1%	"	"	

TestAmerica Portland



Darrell Auvil, Project Manager

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City of Portland Water Pollution Laboratory

6543 N. Burlington Ave.
Portland, OR 97203

Project Name: **General 2010-2013**

Project Number: Basin S-1

Project Manager: Jennifer Shackelford

Report Created:

11/16/10 08:27

Notes and Definitions

Report Specific Notes:

- F - MS or MSD exceeds the control limits

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



Darrell Auvil, Project Manager

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CERTIFICATION SUMMARY

TestAmerica Portland

Method	Matrix	Oregon
None	Soil	


Subcontracted Laboratories

TestAmerica Seattle

5755 8th Street East - Tacoma, WA 98424

- Method Performed: 9060
Samples: PTI0587-01, PTI0587-02
- Method Performed: Moisture
Samples: PTI0587-01, PTI0587-02
- Method Performed: Organotins Dry
Samples: PTI0587-01, PTI0587-02

TestAmerica Portland



Darrell Auvil, Project Manager

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<input type="checkbox"/>		X
425-420-9200	FAX 420-9210	
509-924-9200	FAX 924-9290	
503-906-9200	FAX 906-9210	
907-563-9200	FAX 563-9210	

CHAIN OF CUSTODY REPORT

Work Order #: F10581

[illegible]

TestAmerica Portland
Sample Receiving Checklist

Work Order #: PT10587 Date/Time Received: 9/17/10 1320
Client Name and Project: COFP

Time Zone:
☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☒ PDT/PST ☐ AK ☐ OTHER

Unpacking Checks:

Cooler #(s): 34
Temperatures: 34
Digi #1 Digi #2 IR Gun
☐ ☐ ☒ Plastic ☐ Glass

Temperature out of Range:

☐ Not enough or No Ice
☐ Ice Melted
☐ W/in 4 Hrs of collection
☐ Other: _____

Initials: dm

N/A Yes No

- ☒ ☐ ☐ 1. If ESI client, were temp blanks received? If no, document on NOD.
- ☒ ☐ ☐ 2. Cooler Seals intact? (N/A if hand delivered) if no, document on NOD.
- ☒ ☐ ☐ 3. Chain of Custody present? If no, document on NOD.
- ☒ ☐ ☐ 4. Bottles received intact? If no, document on NOD.
- ☒ ☐ ☐ 5. Sample is not multiphasic? If no, document on NOD.
- ☒ ☐ ☐ 6. Proper Container and preservatives used? If no, document on NOD.
- ☒ ☐ ☐ 7. pH of all samples checked and meet requirements? If no, document on NOD.
- ☒ ☐ ☐ 8. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
- ☒ ☐ ☐ 9. HF Dilution required?
- ☒ ☐ ☐ 10. Sufficient volume provided for all analysis? If no, document on NOD and consult PM before proceeding.
- ☒ ☐ ☐ 11. Did chain of custody agree with samples received? If no, document on NOD.
- ☐ ☒ ☐ 12. Is the "Sampled by" section of the COC completed?
- ☒ ☐ ☐ 13. Were VOA/Oil Syringe samples without headspace?
- ☒ ☐ ☐ 14. Were VOA vials preserved? ☐ HCl ☐ Sodium Thiosulfate ☐ Ascorbic Acid
- ☐ ☒ ☐ 15. Did samples require preservation with sodium thiosulfate?
- ☒ ☐ ☐ 16. If yes to #15, was the residual chlorine test negative? If no, document on NOD.
- ☒ ☐ ☐ 17. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
- ☒ ☐ ☐ 18. Is sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM before proceeding.
- ☒ ☐ ☐ 19. Are analyses with short holding times received in hold?
- ☒ ☐ ☐ 20. Was Standard Turn Around (TAT) requested?
- ☒ ☐ ☐ 21. Receipt date(s) < 48 hours past the collection date(s)? If no, notify PM.

TestAmerica Portland
Sample Receiving Checklist

Work Order #: PT10587

Login Checks:

Initials: jm

N/A Yes No

- ☒ ☒ ☐ 22. Sufficient volume provided for all analysis? If no, document on NOD & contact PM.
- ☒ ☐ ☐ 23. Sufficient volume provided for client requested MS/MSD or matrix duplicates? If no, document on NOD and contact PM.
- ☒ ☐ ☐ 24. Did the chain of custody include "received by" and "relinquished by" signatures, dates and times?
- ☐ ☒ ☐ 25. Were special log in instructions read and followed?
- ☐ ☒ ☐ 26. Were tests logged checked against the COC?
- ☒ ☐ ☐ 27. Were rush notices printed and delivered?
- ☒ ☐ ☐ 28. Were short hold notices printed and delivered?
- ☐ ☒ ☐ 29. Were subcontract COCs printed?
- ☒ ☐ ☐ 30. Was HF dilution logged?

Labeling and Storage Checks:

Initials: jm

N/A Yes No

- ☐ ☒ ☐ 31. Were the subcontracted samples/containers put in Sx fridge?
- ☒ ☐ ☐ 32. Were sample bottles and COC double checked for dissolved/filtered metals?
- ☒ ☐ ☐ 33. Did the sample ID, Date, and Time from label match what was logged?
- ☒ ☐ ☐ 34. Were Foreign sample stickers affixed to each container and containers stored in foreign fridge?
- ☒ ☐ ☐ 35. Were HF stickers affixed to each container, and containers stored in Sx fridge?
- ☒ ☐ ☐ 36. Was an NOD for created for noted discrepancies and placed in folder?

Document any problems or discrepancies and the actions taken to resolve them on a Notice of Discrepancy form (NOD).

Stormwater Investigation

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Event 1: February 12, 2011



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 Basin S-1 Stormwater Sampling Event 1

To: File
From: Andrew Davidson, GSI Water Solutions, Inc. (GSI)
Date: May 25, 2011

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated from a source control investigation sampling event conducted by the City of Portland (City) in Basin S-1 on February 12, 2011. Four stormwater samples, including three field samples (W11B106-01, W11B106-02, W11B106-03) and one duplicate sample (W11B1106-04) were collected and submitted for analyses.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontracted laboratory. The following laboratories conducted the analyses listed:

- BES WPCL
 - Total Suspended Solids – SM 2540D
 - Total Metals – EPA 200.8
 - Polycyclic Aromatic Hydrocarbons (PAHs) and Phthalates – EPA 8270M-SIM
 - Polychlorinated Biphenyls (PCBs) – EPA 8082
- Test America (TA)
 - Total Organic Carbon – SM 5310C

The WPCL laboratory report and the subcontracted laboratory report for all analyses associated with this sampling event are attached.

The following QA/QC review of the analytical data is based on the available documentation provided by WPCL and the subcontracted laboratories. The QA/QC review of the analytical data consisted of reviewing the following elements for each laboratory report, if applicable and/or available:

- Chain-of-custody – for completeness and continuous custody

- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate and/or internal standard recoveries within laboratory control limits
- Matrix spike and matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control and duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits
- Relative percent differences (RPDs) for laboratory duplicate samples within laboratory control limits

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

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

Samples for all analyses were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the laboratory analyses of metals, PAHs/phthalates, PCB Aroclors, and TOC. No analytes were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries were completed during the laboratory analyses of PAHs/phthalates and PCB Aroclors. All surrogate recoveries were within laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

MS and/or MSD samples were processed during the laboratory analysis of total metals, PAHs/phthalates, and TOC. The percent recoveries for seven analytes were outside laboratory control limits for the MS and MSD samples processed during the analysis of PAHs and phthalates. WPCL reports that the low MS/MSD recoveries are attributable to a non-homogenous sample matrix and, for some compounds, the amount of target analyte spiked in the MS/MSD samples was low compared to the concentration already present in the matrix source. RPDs for MS/MSD samples were within laboratory control limits. Percent recoveries and RPDs were within laboratory control limits for MS and MSD samples processed during the analysis of total metals and TOC.

Laboratory Control Sample/Laboratory Control Sample Duplicate

LC and/or DLC samples were processed during the laboratory analysis of TSS, total metals, PAHs/phthalates, PCB Aroclors, and TOC. LC/DLC sample recoveries and RPDs were within laboratory control limits for all analyses.

Laboratory Duplicate Samples

Laboratory duplicate samples were processed during the laboratory analysis of TSS, total metals, and TOC. All RPDs for the duplicate samples were within laboratory control limits.

Other

The WPCL included a case narrative for PCB analysis that states “The samples may contain traces of Aroclor but post-cleanup interferences prevented definitive identification.”

A field duplicate was obtained as part of the field sampling program. Field sample W11B106-01 and its duplicate sample W11B1106-04 were obtained at the same location in sequential time order. The analyte RPDs for the field and field duplicate sample were calculated and ranged from 1 to 72 percent. Four analytes (anthracene, fluoranthene, fluorine, phenanthrene) had RPDs that exceeded 50 percent. Inconsistent results for matrix QC during the PAH analysis (MS and MSD) indicate non-homogenous sample matrix in field sample W11B106-01 (used as MS/MSD source) and its duplicate sample W11B1106-04. Accordingly, PAH values associated with these two samples are flagged as estimates “J”.



City of Portland
Water Pollution Control Laboratory

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



March 02, 2011

Linda Scheffler
Director's Office

Work Order
W11B106

Project
Portland Harbor

Received
02/12/11 18:29

Enclosed are the results of analysis for the above work order. If you have questions concerning this report, please contact your project coordinator Peter Abrams at 503-823-5533.

Renee Chauvin
Laboratory Coordinator QA/QC



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



LABORATORY ANALYSIS REPORT

Project:	Portland Harbor	Client:	Director's Office
Work Order:	W11B106	Project Mgr:	Linda Scheffler
Received:	2/12/11 18:29	WQDB #:	Janus329
Submitted By:	Field Operations		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date		Qualifier
				Start	End	
S1_SW1	W11B106-01	Stormwater	Grab	02/12/11 17:50	02/12/11 17:50	
S1_SW2	W11B106-02	Stormwater	Grab	02/12/11 17:32	02/12/11 17:32	
S1_SW3	W11B106-03	Stormwater	Grab	02/12/11 17:41	02/12/11 17:41	
DUP	W11B106-04	Stormwater	Grab	02/12/11 00:00	02/12/11 00:00	

Case Narrative

PCB Analysis:

The samples may contain traces of Aroclor but post-cleanup interferences prevented definitive identification.

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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General Chemistry

Total Suspended Solids

S1_SW1 : W11B106-01

Total suspended solids	49	mg/L		2	B11B189	02/14/11	02/14/11	SM 2540D
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S1_SW2 : W11B106-02

Total suspended solids	68	mg/L		2	B11B189	02/14/11	02/14/11	SM 2540D
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S1_SW3 : W11B106-03

Total suspended solids	82	mg/L		2	B11B189	02/14/11	02/14/11	SM 2540D
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DUP : W11B106-04

Total suspended solids	53	mg/L		2	B11B189	02/14/11	02/14/11	SM 2540D
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Reported: 03/02/11 13:10

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11B106**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Total Metals

Total Metals by ICPMS

S1_SW1 : W11B106-01

Copper	53.8	ug/L		0.200	1	B11B240	02/16/11	02/17/11	EPA 200.8	
Zinc	456	ug/L		1.00	2	B11B240	02/16/11	02/17/11	EPA 200.8	

S1_SW2 : W11B106-02

Copper	146	ug/L		0.800	4	B11B240	02/16/11	02/17/11	EPA 200.8	
Zinc	907	ug/L		2.00	4	B11B240	02/16/11	02/17/11	EPA 200.8	

S1_SW3 : W11B106-03

Copper	51.0	ug/L		0.200	1	B11B240	02/16/11	02/17/11	EPA 200.8	
Zinc	270	ug/L		0.500	1	B11B240	02/16/11	02/17/11	EPA 200.8	

DUP : W11B106-04

Copper	54.2	ug/L		0.200	1	B11B240	02/16/11	02/17/11	EPA 200.8	
Zinc	460	ug/L		1.00	2	B11B240	02/16/11	02/17/11	EPA 200.8	

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Project: **Portland Harbor**
Work Order: **W11B106**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW1 : W11B106-01

M3

Acenaphthene	0.15	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Acenaphthylene	0.050	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Anthracene	0.34	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(a)anthracene	0.83	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(a)pyrene	0.77	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(b)fluoranthene	0.93	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(g,h,i)perylene	0.51	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(k)fluoranthene	0.36	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Chrysene	0.93	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	0.17	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Fluoranthene	1.9	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Fluorene	0.12	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	0.47	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
1-Methylnaphthalene	0.042	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
2-Methylnaphthalene	0.058	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Naphthalene	0.066	ug/L	0.040	0.040	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Phenanthrene	1.3	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Pyrene	1.8	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	2.3	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM

Surrogate

Result

Expected

%Rec

Limits(%)

2-Methylnaphthalene-d10	0.16	0.216	76%	20-110	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Fluoranthene-d10	0.19	0.216	87%	35-130	B11B235	02/16/11	02/24/11	EPA 8270-SIM

S1_SW2 : W11B106-02

Acenaphthene	0.023	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Acenaphthylene	0.036	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Anthracene	0.035	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(a)anthracene	0.063	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(a)pyrene	0.064	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(b)fluoranthene	0.11	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(g,h,i)perylene	0.095	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(k)fluoranthene	0.034	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Chrysene	0.11	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	0.018	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Fluoranthene	0.21	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Fluorene	0.043	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM

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Renee Chauvin, Laboratory Coordinator QA/QC



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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11B106**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW2 : W11B106-02

Indeno(1,2,3-cd)pyrene	0.053	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
1-Methylnaphthalene	0.056	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
2-Methylnaphthalene	0.081	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Naphthalene	0.11	ug/L	0.040	0.040	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Phenanthrene	0.16	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Pyrene	0.21	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	2.2	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.17	0.216	81%	20-110
Fluoranthene-d10	0.18	0.216	82%	35-130

S1_SW3 : W11B106-03

Acenaphthene	0.11	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Acenaphthylene	0.048	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Anthracene	0.24	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(a)anthracene	0.68	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(a)pyrene	0.65	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(b)fluoranthene	0.75	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(g,h,i)perylene	0.46	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Benzo(k)fluoranthene	0.31	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Chrysene	0.82	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	0.14	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Fluoranthene	1.4	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Fluorene	0.097	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	0.41	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
1-Methylnaphthalene	0.046	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
2-Methylnaphthalene	0.049	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Naphthalene	0.056	ug/L	0.040	0.040	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Phenanthrene	0.92	ug/L	0.020	0.020	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Pyrene	1.5	ug/L	0.010	0.010	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	3.7	ug/L	0.50	1.0	1	B11B235	02/16/11	02/24/11	EPA 8270-SIM

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Project: **Portland Harbor**
Work Order: **W11B106**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW3 : W11B106-03

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.12	0.216	56%	20-110
Fluoranthene-d10	0.18	0.216	81%	35-130

DUP : W11B106-04

Surrogate	Result	Units	Expected	%Rec	Limits(%)
Acenaphthene	0.074	ug/L	0.020	0.020	1
Acenaphthylene	0.048	ug/L	0.020	0.020	1
Anthracene	0.16	ug/L	0.020	0.020	1
Benzo(a)anthracene	0.54	ug/L	0.010	0.010	1
Benzo(a)pyrene	0.54	ug/L	0.010	0.010	1
Benzo(b)fluoranthene	0.69	ug/L	0.010	0.010	1
Benzo(g,h,i)perylene	0.38	ug/L	0.010	0.010	1
Benzo(k)fluoranthene	0.24	ug/L	0.010	0.010	1
Chrysene	0.64	ug/L	0.010	0.010	1
Dibenzo(a,h)anthracene	0.12	ug/L	0.010	0.010	1
Fluoranthene	1.1	ug/L	0.010	0.010	1
Fluorene	0.075	ug/L	0.020	0.020	1
Indeno(1,2,3-cd)pyrene	0.35	ug/L	0.010	0.010	1
1-Methylnaphthalene	0.037	ug/L	0.020	0.020	1
2-Methylnaphthalene	0.041	ug/L	0.020	0.020	1
Naphthalene	0.051	ug/L	0.040	0.040	1
Phenanthrene	0.64	ug/L	0.020	0.020	1
Pyrene	1.1	ug/L	0.010	0.010	1
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1
Diethyl phthalate	ND	ug/L	0.50	1.0	1
Dimethyl phthalate	ND	ug/L	0.50	1.0	1
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1
Bis(2-ethylhexyl) phthalate	2.0	ug/L	0.50	1.0	1
Surrogate	Result		Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.15		0.216	69%	20-110
Fluoranthene-d10	0.17		0.216	78%	35-130

Reported: 03/02/11 13:10

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Project: **Portland Harbor**
Work Order: **W11B106**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

S1_SW1 : W11B106-01

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082

Surrogate	Result	Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0362	0.0495	73%	41-107.6	B11B206	02/15/11	02/15/11	EPA 8082
Decachlorobiphenyl	0.0398	0.0495	80%	8.3-153	B11B206	02/15/11	02/15/11	EPA 8082

S1_SW2 : W11B106-02

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082

Surrogate	Result	Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0301	0.0495	61%	41-107.6	B11B206	02/15/11	02/15/11	EPA 8082
Decachlorobiphenyl	0.0366	0.0495	74%	8.3-153	B11B206	02/15/11	02/15/11	EPA 8082

S1_SW3 : W11B106-03

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082

Surrogate	Result	Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0303	0.0490	62%	41-107.6	B11B206	02/15/11	02/15/11	EPA 8082
Decachlorobiphenyl	0.0382	0.0490	78%	8.3-153	B11B206	02/15/11	02/15/11	EPA 8082

DUP : W11B106-04

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082

Reported: 03/02/11 13:10

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11B106**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

DUP : W11B106-04

Aroclor 1248	ND	ug/L		0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1254	ND	ug/L		0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1260	ND	ug/L		0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1262	ND	ug/L		0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Aroclor 1268	ND	ug/L		0.0250	1	B11B206	02/15/11	02/15/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0320		0.0490	65%	41-107.6	B11B206	02/15/11	02/15/11	EPA 8082
Decachlorobiphenyl	0.0438		0.0490	89%	8.3-153	B11B206	02/15/11	02/15/11	EPA 8082

Reported: 03/02/11 13:10

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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11B106**

Client: Director's Office
Project Mgr: Linda Scheffler

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Suspended Solids - Batch B11B189										
LCS (B11B189-BS1)										
Total suspended solids	90	mg/L		2	100		90 (90-110)		02/14/11 :02/14/11	
Duplicate (B11B189-DUP1) Source: W11B109-03										
Total suspended solids	6	mg/L		2		6	6 (20)		02/14/11 :02/14/11	
Duplicate (B11B189-DUP2) Source: W11B104-02										
Total suspended solids	5	mg/L		2		4	11 (20)		02/14/11 :02/14/11	

Total Metals - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Metals by ICPMS - Batch B11B240										
Blank (B11B240-BLK1)										
Copper	ND	ug/L		0.200					02/16/11 :02/17/11	
Zinc	ND	ug/L		0.500					02/16/11 :02/17/11	
LCS (B11B240-BS1)										
Copper	10.30	ug/L		0.200	10.0		103 (85-115)		02/16/11 :02/17/11	
Zinc	50.92	ug/L		0.500	50.0		102 (85-115)		02/16/11 :02/17/11	
Duplicate (B11B240-DUP1) Source: W11B103-02										
Copper	8.302	ug/L		0.200		8.269	0.4 (20)		02/16/11 :02/17/11	
Zinc	54.37	ug/L		0.500		54.31	0.1 (20)		02/16/11 :02/17/11	
Duplicate (B11B240-DUP3) Source: W11B112-01										
Copper	21.45	ug/L		0.200		21.83	2 (20)		02/16/11 :02/17/11	
Zinc	184.1	ug/L		0.500		182.6	0.8 (20)		02/16/11 :02/17/11	
Matrix Spike (B11B240-MS1) Source: W11B103-02										
Copper	18.53	ug/L		0.200	10.0	8.269	103 (70-130)		02/16/11 :02/17/11	
Zinc	105.6	ug/L		0.500	50.0	54.31	103 (70-130)		02/16/11 :02/17/11	
Matrix Spike (B11B240-MS2) Source: W11B112-01										
Copper	31.76	ug/L		0.200	10.0	21.83	99 (70-130)		02/16/11 :02/17/11	
Zinc	233.1	ug/L		0.500	50.0	182.6	101 (70-130)		02/16/11 :02/17/11	

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Renee Chauvin, Laboratory Coordinator QA/QC



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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11B106**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11B235

Blank (B11B235-BLK1)

Acenaphthene	ND	ug/L	0.020	0.020					02/16/11 :02/23/11	
Acenaphthylene	ND	ug/L	0.020	0.020					02/16/11 :02/23/11	
Anthracene	ND	ug/L	0.020	0.020					02/16/11 :02/23/11	
Benzo(a)anthracene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Benzo(a)pyrene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Chrysene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Fluoranthene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Fluorene	ND	ug/L	0.020	0.020					02/16/11 :02/23/11	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
1-Methylnaphthalene	ND	ug/L	0.020	0.020					02/16/11 :02/23/11	
2-Methylnaphthalene	ND	ug/L	0.020	0.020					02/16/11 :02/23/11	
Naphthalene	ND	ug/L	0.040	0.040					02/16/11 :02/23/11	
Phenanthrene	ND	ug/L	0.020	0.020					02/16/11 :02/23/11	
Pyrene	ND	ug/L	0.010	0.010					02/16/11 :02/23/11	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0					02/16/11 :02/23/11	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0					02/16/11 :02/23/11	
Diethyl phthalate	ND	ug/L	0.50	1.0					02/16/11 :02/23/11	
Dimethyl phthalate	ND	ug/L	0.50	1.0					02/16/11 :02/23/11	
Di-n-octyl phthalate	ND	ug/L	0.50	1.0					02/16/11 :02/23/11	
Bis(2-ethylhexyl) phthalate	ND	ug/L	0.50	1.0					02/16/11 :02/23/11	

Surrogate

2-Methylnaphthalene-d10	0.18			ug/L	0.216	83			02/16/11 :02/23/11	
Fluoranthene-d10	0.21			ug/L	0.216	97			02/16/11 :02/23/11	

LCS (B11B235-BS1)

Acenaphthene	0.0795	ug/L	0.020	0.020	0.108		74 (27-123)		02/16/11 :02/23/11	
Acenaphthylene	0.0881	ug/L	0.020	0.020	0.108		82 (34-116)		02/16/11 :02/23/11	
Anthracene	0.0935	ug/L	0.020	0.020	0.108		86 (42-123)		02/16/11 :02/23/11	
Benzo(a)anthracene	0.0935	ug/L	0.010	0.010	0.108		86 (63-143)		02/16/11 :02/23/11	
Benzo(a)pyrene	0.0827	ug/L	0.010	0.010	0.108		76 (41-144)		02/16/11 :02/23/11	
Benzo(b)fluoranthene	0.0881	ug/L	0.010	0.010	0.108		82 (57-139)		02/16/11 :02/23/11	
Benzo(g,h,i)perylene	0.0951	ug/L	0.010	0.010	0.108		88 (23-155)		02/16/11 :02/23/11	
Benzo(k)fluoranthene	0.0822	ug/L	0.010	0.010	0.108		76 (54-137)		02/16/11 :02/23/11	
Chrysene	0.0903	ug/L	0.010	0.010	0.108		84 (64-142)		02/16/11 :02/23/11	
Dibenzo(a,h)anthracene	0.101	ug/L	0.010	0.010	0.108		93 (27-159)		02/16/11 :02/23/11	
Fluoranthene	0.102	ug/L	0.010	0.010	0.108		94 (68-128)		02/16/11 :02/23/11	
Fluorene	0.0886	ug/L	0.020	0.020	0.108		82 (48-122)		02/16/11 :02/23/11	

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11B106**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11B235

LCS (B11B235-BS1)

Indeno(1,2,3-cd)pyrene	0.0978	ug/L	0.010	0.010	0.108		90 (29-156)		02/16/11 :02/23/11	
1-Methylnaphthalene	0.0746	ug/L	0.020	0.020	0.108		69 (50-150)		02/16/11 :02/23/11	
2-Methylnaphthalene	0.0735	ug/L	0.020	0.020	0.108		68 (50-150)		02/16/11 :02/23/11	
Naphthalene	0.0827	ug/L	0.040	0.040	0.108		76 (45-135)		02/16/11 :02/23/11	
Phenanthrene	0.0957	ug/L	0.020	0.020	0.108		88 (49-129)		02/16/11 :02/23/11	
Pyrene	0.0968	ug/L	0.010	0.010	0.108		90 (67-132)		02/16/11 :02/23/11	
Butyl benzyl phthalate	1.33	ug/L	0.50	1.0	1.08		123 (50-150)		02/16/11 :02/23/11	
Di-n-butyl phthalate	1.29	ug/L	0.50	1.0	1.08		119 (50-150)		02/16/11 :02/23/11	
Diethyl phthalate	1.31	ug/L	0.50	1.0	1.08		121 (50-150)		02/16/11 :02/23/11	
Dimethyl phthalate	1.21	ug/L	0.50	1.0	1.08		112 (50-150)		02/16/11 :02/23/11	
Di-n-octyl phthalate	1.27	ug/L	0.50	1.0	1.08		118 (50-150)		02/16/11 :02/23/11	
Bis(2-ethylhexyl) phthalate	1.56	ug/L	0.50	1.0	1.08		144 (50-150)		02/16/11 :02/23/11	

Surrogate

2-Methylnaphthalene-d10	0.16			ug/L	0.216		73 (20-110)		02/16/11 :02/23/11	
Fluoranthene-d10	0.21			ug/L	0.216		96 (35-130)		02/16/11 :02/23/11	

Matrix Spike (B11B235-MS1)

Source: W11B106-01

Z0

Acenaphthene	0.323	ug/L	0.020	0.020	0.270	0.155	62 (14-123)		02/16/11 :02/24/11	
Acenaphthylene	0.309	ug/L	0.020	0.020	0.270	0.0503	96 (17-116)		02/16/11 :02/24/11	
Anthracene	0.435	ug/L	0.020	0.020	0.270	0.336	37 (22-123)		02/16/11 :02/24/11	
Benzo(a)anthracene	0.779	ug/L	0.010	0.010	0.270	0.829	-19 (32-143)		02/16/11 :02/24/11	
Benzo(a)pyrene	0.769	ug/L	0.010	0.010	0.270	0.768	0.4 (21-144)		02/16/11 :02/24/11	
Benzo(b)fluoranthene	0.894	ug/L	0.010	0.010	0.270	0.931	-14 (29-139)		02/16/11 :02/24/11	
Benzo(g,h,i)perylene	0.646	ug/L	0.010	0.010	0.270	0.515	49 (12-155)		02/16/11 :02/24/11	
Benzo(k)fluoranthene	0.497	ug/L	0.010	0.010	0.270	0.355	52 (27-137)		02/16/11 :02/24/11	
Chrysene	0.914	ug/L	0.010	0.010	0.270	0.931	-6 (32-142)		02/16/11 :02/24/11	
Dibenzo(a,h)anthracene	0.405	ug/L	0.010	0.010	0.270	0.165	89 (14-159)		02/16/11 :02/24/11	
Fluoranthene	1.35	ug/L	0.010	0.010	0.270	1.86	-191 (34-128)		02/16/11 :02/24/11	
Fluorene	0.330	ug/L	0.020	0.020	0.270	0.115	80 (24-122)		02/16/11 :02/24/11	
Indeno(1,2,3-cd)pyrene	0.618	ug/L	0.010	0.010	0.270	0.468	56 (15-156)		02/16/11 :02/24/11	
1-Methylnaphthalene	0.308	ug/L	0.020	0.020	0.270	0.0422	98 (50-150)		02/16/11 :02/24/11	
2-Methylnaphthalene	0.315	ug/L	0.020	0.020	0.270	0.0578	95 (50-150)		02/16/11 :02/24/11	
Naphthalene	0.291	ug/L	0.040	0.040	0.270	0.0665	83 (23-135)		02/16/11 :02/24/11	
Phenanthrene	0.836	ug/L	0.020	0.020	0.270	1.33	-185 (25-129)		02/16/11 :02/24/11	
Pyrene	1.35	ug/L	0.010	0.010	0.270	1.80	-165 (34-132)		02/16/11 :02/24/11	
Butyl benzyl phthalate	3.36	ug/L	0.50	1.0	2.70	ND	124 (25-150)		02/16/11 :02/24/11	
Di-n-butyl phthalate	3.19	ug/L	0.50	1.0	2.70	ND	118 (25-150)		02/16/11 :02/24/11	
Diethyl phthalate	3.26	ug/L	0.50	1.0	2.70	ND	121 (25-150)		02/16/11 :02/24/11	
Dimethyl phthalate	3.26	ug/L	0.50	1.0	2.70	ND	121 (25-150)		02/16/11 :02/24/11	
Di-n-octyl phthalate	3.56	ug/L	0.50	1.0	2.70	ND	132 (25-150)		02/16/11 :02/24/11	
Bis(2-ethylhexyl) phthalate	5.29	ug/L	0.50	1.0	2.70	2.27	112 (25-150)		02/16/11 :02/24/11	

Surrogate

Reported: 03/02/11 13:10

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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11B106**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11B235

Matrix Spike (B11B235-MS1)

Source: W11B106-01

Z0

Surrogate

2-Methylnaphthalene-d10	0.16			ug/L	0.216		73 (20-110)		02/16/11 :02/24/11	
Fluoranthene-d10	0.18			ug/L	0.216		85 (35-130)		02/16/11 :02/24/11	

Matrix Spike Dup (B11B235-MSD1)

Source: W11B106-01

Z0

Acenaphthene	0.328	ug/L	0.020	0.020	0.270	0.155	64 (14-123)	1 (50)	02/16/11 :02/24/11	
Acenaphthylene	0.298	ug/L	0.020	0.020	0.270	0.0503	92 (17-116)	4 (50)	02/16/11 :02/24/11	
Anthracene	0.414	ug/L	0.020	0.020	0.270	0.336	29 (22-123)	5 (50)	02/16/11 :02/24/11	
Benzo(a)anthracene	0.758	ug/L	0.010	0.010	0.270	0.829	-26 (32-143)	3 (50)	02/16/11 :02/24/11	
Benzo(a)pyrene	0.745	ug/L	0.010	0.010	0.270	0.768	-8 (21-144)	3 (50)	02/16/11 :02/24/11	
Benzo(b)fluoranthene	0.828	ug/L	0.010	0.010	0.270	0.931	-38 (29-139)	8 (50)	02/16/11 :02/24/11	
Benzo(g,h,i)perylene	0.619	ug/L	0.010	0.010	0.270	0.515	39 (12-155)	4 (50)	02/16/11 :02/24/11	
Benzo(k)fluoranthene	0.526	ug/L	0.010	0.010	0.270	0.355	63 (27-137)	6 (50)	02/16/11 :02/24/11	
Chrysene	0.866	ug/L	0.010	0.010	0.270	0.931	-24 (32-142)	5 (50)	02/16/11 :02/24/11	
Dibenzo(a,h)anthracene	0.388	ug/L	0.010	0.010	0.270	0.165	82 (14-159)	4 (50)	02/16/11 :02/24/11	
Fluoranthene	1.33	ug/L	0.010	0.010	0.270	1.86	-197 (34-128)	1 (50)	02/16/11 :02/24/11	
Fluorene	0.320	ug/L	0.020	0.020	0.270	0.115	76 (24-122)	3 (50)	02/16/11 :02/24/11	
Indeno(1,2,3-cd)pyrene	0.593	ug/L	0.010	0.010	0.270	0.468	46 (15-156)	4 (50)	02/16/11 :02/24/11	
1-Methylnaphthalene	0.289	ug/L	0.020	0.020	0.270	0.0422	91 (50-150)	6 (50)	02/16/11 :02/24/11	
2-Methylnaphthalene	0.292	ug/L	0.020	0.020	0.270	0.0578	87 (50-150)	7 (50)	02/16/11 :02/24/11	
Naphthalene	0.278	ug/L	0.040	0.040	0.270	0.0665	78 (23-135)	5 (50)	02/16/11 :02/24/11	
Phenanthrene	0.844	ug/L	0.020	0.020	0.270	1.33	-181 (25-129)	1 (50)	02/16/11 :02/24/11	
Pyrene	1.33	ug/L	0.010	0.010	0.270	1.80	-170 (34-132)	1 (50)	02/16/11 :02/24/11	
Butyl benzyl phthalate	3.24	ug/L	0.50	1.0	2.70	ND	120 (25-150)	4 (50)	02/16/11 :02/24/11	
Di-n-butyl phthalate	3.04	ug/L	0.50	1.0	2.70	ND	113 (25-150)	5 (50)	02/16/11 :02/24/11	
Diethyl phthalate	3.14	ug/L	0.50	1.0	2.70	ND	116 (25-150)	4 (50)	02/16/11 :02/24/11	
Dimethyl phthalate	3.15	ug/L	0.50	1.0	2.70	ND	117 (25-150)	4 (50)	02/16/11 :02/24/11	
Di-n-octyl phthalate	3.51	ug/L	0.50	1.0	2.70	ND	130 (25-150)	1 (50)	02/16/11 :02/24/11	
Bis(2-ethylhexyl) phthalate	5.11	ug/L	0.50	1.0	2.70	2.27	105 (25-150)	3 (50)	02/16/11 :02/24/11	

Surrogate

2-Methylnaphthalene-d10	0.16			ug/L	0.216		75 (20-110)		02/16/11 :02/24/11	
Fluoranthene-d10	0.17			ug/L	0.216		80 (35-130)		02/16/11 :02/24/11	

Reported: 03/02/11 13:10

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Renee Chauvin, Laboratory Coordinator QA/QC



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Project: **Portland Harbor**
Work Order: **W11B106**

Client: Director's Office
Project Mgr: Linda Scheffler

Polychlorinated Biphenyls (PCBs) - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
PCB Aroclors by GC-ECD - Batch B11B206										
Blank (B11B206-BLK1)										
Aroclor 1016/1242	ND	ug/L		0.0250					02/15/11 :02/15/11	
Aroclor 1221	ND	ug/L		0.0500					02/15/11 :02/15/11	
Aroclor 1232	ND	ug/L		0.0250					02/15/11 :02/15/11	
Aroclor 1248	ND	ug/L		0.0250					02/15/11 :02/15/11	
Aroclor 1254	ND	ug/L		0.0250					02/15/11 :02/15/11	
Aroclor 1260	ND	ug/L		0.0250					02/15/11 :02/15/11	
Aroclor 1262	ND	ug/L		0.0250					02/15/11 :02/15/11	
Aroclor 1268	ND	ug/L		0.0250					02/15/11 :02/15/11	
Surrogate										
Tetrachloro-m-xylene	0.0329			ug/L	0.0500		66		02/15/11 :02/15/11	
Decachlorobiphenyl	0.0476			ug/L	0.0500		95		02/15/11 :02/15/11	
LCS (B11B206-BS1)										
Aroclor 1016/1242	0.1208	ug/L		0.0250	0.125		97 (64-122)		02/15/11 :02/15/11	
Aroclor 1260	0.1276	ug/L		0.0250	0.125		102 (65.4-122)		02/15/11 :02/15/11	
Surrogate										
Tetrachloro-m-xylene	0.0356			ug/L	0.0500		71 (41-107.6)		02/15/11 :02/15/11	
Decachlorobiphenyl	0.0512			ug/L	0.0500		102 (8.3-153)		02/15/11 :02/15/11	
LCS Dup (B11B206-BSD1)										
Aroclor 1016/1242	0.1145	ug/L		0.0250	0.125		92 (64-122)	5 (20)	02/15/11 :02/15/11	
Aroclor 1260	0.1252	ug/L		0.0250	0.125		100 (65.4-122)	2 (20)	02/15/11 :02/15/11	
Surrogate										
Tetrachloro-m-xylene	0.0347			ug/L	0.0500		69 (41-107.6)		02/15/11 :02/15/11	
Decachlorobiphenyl	0.0508			ug/L	0.0500		102 (8.3-153)		02/15/11 :02/15/11	

Qualifiers

- M3 Inconsistent results for matrix QC (duplicates and/or matrix spikes) indicate non-homogeneous sample matrix. Sample results should be considered estimates.
- Z0 Low Matrix Spike and Matrix Spike Duplicate recoveries are attributable to non-homogeneous matrix and, for some compounds, the high concentration of target analyte in the sample compared to a low spiking level.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference

Reported: 03/02/11 13:10

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Renee Chauvin, Laboratory Coordinator QA/QC

Water Pollution Control Laboratory
6543 N. Burlington Ave.
Portland, Oregon 97203-4552
Sample Custodian: (503) 823-5696
General Lab: (503) 823-5681



City of Portland
Chain-of-Custody



Bureau of Environmental Services

Date: 2/12/11

Work Order #: W11B106

Collected By: MJS, CLK

Client Name: Director's Office
Project Name: Portland Harbor

Matrix: Stormwater

Requested Analyses

Lab Number	Special Instructions		Sample Date		Sample Time	Sample Type	TSS	TOC	Totals Metals (Cu, Zn)	PAH + Phthalates ¹	PCB Aroclors (Low-level)	# of Containers	Remarks
	Location ID												
01	S1_SW1	2/12/11	1750	G			•	•	•	•	•		AAM131
02	S1_SW2	2/12/11	1732	G			•	•	•	•	•		AAM127
03	S1_SW3	2/12/11	1741	G			•	•	•	•	•		AAM133
04	DUP	2/12/11					•	•	•	•	•		Duplicate

Inquired By: <i>Mark G. Sullivan</i>	Received By: <i>Mark G. Sullivan</i>	Relinquished By: <i>Mark G. Sullivan</i>
Signature: <i>Mark G. Sullivan</i>	Signature: <i>Mark G. Sullivan</i>	Signature: <i>Mark G. Sullivan</i>
Date: 2/12/11	Date: 2/13/11	Date: 2/13/11
Time: 1829	Time: 0900	Time: 0900
Printed Name: Mark G. Sullivan	Printed Name: Mark G. Sullivan	Printed Name: Mark G. Sullivan

*Samples stored in sample receiving fridge overnight

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Tel: (503) 906-9200

TestAmerica Job ID: PUB0416

TestAmerica Sample Delivery Group: PUB0416

Client Project/Site: W11B106

Client Project Description: Portland Harbor

For:

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

Attn: Renee Chauvin



Authorized for release by:
3/1/2011 5:04 PM

Darrell Auvil
Project Manager
darrell.auvil@testamericainc.com

LINKS

Review your project
results through

TotalAccess

Have a Question?



Visit us at:

www.testamericainc.com

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all 2003 NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.



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Sample Summary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11B106

TestAmerica Job ID: PUB0416

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
PUB0416-01	W11B106-01 (S1_SW1)	Stormwater	02/12/11 17:50	02/14/11 14:40
PUB0416-02	W11B106-02 (S1_SW2)	Stormwater	02/12/11 17:32	02/14/11 14:40
PUB0416-03	W11B106-03 (S1_SW3)	Stormwater	02/12/11 17:41	02/14/11 14:40
PUB0416-04	W11B106-04 (DUP)	Stormwater	02/12/11 00:00	02/14/11 14:40

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

Qualifier Definition/Glossary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11B106

TestAmerica Job ID: PUB0416
SDG: PUB0416

Glossary

Glossary	Glossary Description
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

Detection Summary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11B106

TestAmerica Job ID: PUB0416
SDG: PUB0416

Client Sample ID: W11B106-01 (S1_SW1)

Lab Sample ID: PUB0416-01

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	10.8		1.00		mg/l	1.00		SM 5310C	total

Client Sample ID: W11B106-02 (S1_SW2)

Lab Sample ID: PUB0416-02

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	25.9		1.00		mg/l	1.00		SM 5310C	total

Client Sample ID: W11B106-03 (S1_SW3)

Lab Sample ID: PUB0416-03

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	15.7		1.00		mg/l	1.00		SM 5310C	total

Client Sample ID: W11B106-04 (DUP)

Lab Sample ID: PUB0416-04

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Organic Carbon	12.3		1.00		mg/l	1.00		SM 5310C	total

Analytical Data

Client: City of Portland Water Pollution Laboratory
Project/Site: W11B106

TestAmerica Job ID: PUB0416
SDG: PUB0416

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Client Sample ID: W11B106-01 (S1_SW1)

Date Collected: 02/12/11 17:50

Date Received: 02/14/11 14:40

Lab Sample ID: PUB0416-01

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	10.8		1.00		mg/l		02/16/11 09:32	02/16/11 22:09	1.00

Client Sample ID: W11B106-02 (S1_SW2)

Date Collected: 02/12/11 17:32

Date Received: 02/14/11 14:40

Lab Sample ID: PUB0416-02

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	25.9		1.00		mg/l		02/16/11 09:32	02/16/11 22:09	1.00

Client Sample ID: W11B106-03 (S1_SW3)

Date Collected: 02/12/11 17:41

Date Received: 02/14/11 14:40

Lab Sample ID: PUB0416-03

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	15.7		1.00		mg/l		02/16/11 09:32	02/16/11 22:09	1.00

Client Sample ID: W11B106-04 (DUP)

Date Collected: 02/12/11 00:00

Date Received: 02/14/11 14:40

Lab Sample ID: PUB0416-04

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	12.3		1.00		mg/l		02/16/11 09:32	02/16/11 22:09	1.00

Quality Control Data

Client: City of Portland Water Pollution Laboratory
Project/Site: W11B106

TestAmerica Job ID: PUB0416
SDG: PUB0416

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Lab Sample ID: 11B0469-BLK1

Matrix: Water

Analysis Batch: 11B0469

Client Sample ID: 11B0469-BLK1

Prep Type: total

Prep Batch: 11B0469_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.00		mg/l		02/16/11 09:32	02/16/11 22:09	1.00

Lab Sample ID: 11B0469-BS1

Matrix: Water

Analysis Batch: 11B0469

Client Sample ID: 11B0469-BS1

Prep Type: total

Prep Batch: 11B0469_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	20.0	18.0		mg/l		90.0	85 - 115

Lab Sample ID: 11B0469-MS1

Matrix: Water

Analysis Batch: 11B0469

Client Sample ID: PUB0371-06

Prep Type: total

Prep Batch: 11B0469_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	2.63		25.0	28.1		mg/l		102	75 - 125

Lab Sample ID: 11B0469-DUP1

Matrix: Water

Analysis Batch: 11B0469

Client Sample ID: PUB0371-06

Prep Type: total

Prep Batch: 11B0469_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	2.63		2.72		mg/l		3.39	20

Certification Summary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11B106

TestAmerica Job ID: PUB0416
SDG: PUB0416

Laboratory	Authority	Program	EPA Region	Certification ID	* Expiration Date
TestAmerica Portland		USDA		P330-07-XXXXXX	02/17/14
TestAmerica Portland	Alaska	Alaska UST	10	UST-012	12/26/10
TestAmerica Portland	Alaska	State Program	10	OR00040	04/21/11
TestAmerica Portland	California	State Program	9	2597	09/30/11
TestAmerica Portland	Oregon	NELAC	10	OR100021	01/09/12
TestAmerica Portland	Washington	State Program	10	C586	06/23/11

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.
* Any expired certifications in this list are currently pending renewal and are considered valid.



SUBCONTRACT ORDER
City of Portland Water Pollution Control Lab
W11B106

PUB0416

SENDING LABORATORY:

City of Portland Water Pollution Control Lab
6543 N. Burlington Ave
Portland, OR 97203
Phone: 503-823-5600
Fax: 503-823-5656
Invoice To: Charles Lytle using P.O.# 30001516

RECEIVING LABORATORY:

TestAmerica
9405 SW Nimbus Ave
Beaverton, OR 97008
Phone : (503) 906-9200
Fax: (503) 906-9210

WPCL Project Name

Portland Harbor

TURNAROUND REQUEST

☒ Standard

☐ Rush _ day(s)

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: W11B106-01	Water	Sampled:02/12/11 17:50		
Out-TOC Water	03/01/11 17:00	03/12/11 17:50		
Containers Supplied: G amber 250ml H2SO4 (C)				
Sample ID: W11B106-02	Water	Sampled:02/12/11 17:32		
Out-TOC Water	03/01/11 17:00	03/12/11 17:32		
Containers Supplied: G amber 250ml H2SO4 (C)				
Sample ID: W11B106-03	Water	Sampled:02/12/11 17:41		
Out-TOC Water	03/01/11 17:00	03/12/11 17:41		
Containers Supplied: G amber 250ml H2SO4 (C)				
Sample ID: W11B106-04	Water	Sampled:02/12/11 00:00		
Out-TOC Water	03/01/11 17:00	03/12/11 00:00		
Containers Supplied: G amber 250ml H2SO4 (C)				

Released By	<i>Kristen Momen</i>	Date	<i>2/14/11 @ 14:00</i>	Received By	<i>Barbara</i>	Date	<i>2/14/11 @ 14:00</i>
Released By	<i>Barbara</i>	Date	<i>2/14/11 @ 14:40</i>	Received By	<i>Louisa M</i>	Date	<i>2/14/11 1440</i>

4.8

Portland Sample Control Checklist

Work Order #: PV80416 Date/Time Received: 2/14/11 1440
Client Name: City of Portland
Project Name: will B106
Time Zone: ☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☒ PDT/PST ☐ AK ☐ HI ☐ OTHER

Unpacking Checks:

Cooler (s): 1
Temperature (s): 4.8

Digi #1 ☐ Digi #2 ☐ IR Gun ☒ (☐ Plastic ☒ Glass)

Raytek ☐ (☐ Plastic ☐ Glass)

Ice used: (circle one) GEL LOOSE BLUE NONE OTHER: _____ Initials: _____

N/A Yes No

- ☒ ☐ ☐ 1. If ESI client, were temp blanks received? If no, document on NOD.
- ☒ ☐ ☐ 2. Cooler Seals intact? (N/A if hand delivered) if no and ESI client, document on NOD.
- ☒ ☐ ☐ 3. Chain of Custody present? If no, document on NOD. Along with "received by" & "relinquished by" signatures with date & time?
- ☒ ☐ ☐ 4. Bottles received intact? If no, document on NOD.
- ☒ ☐ ☐ 5. Sample is not multiphasic? If no, document on NOD.
- ☒ ☒ ☐ 6. Sampler name/signature documented on COC?
- ☒ ☐ ☐ 7. Proper Container and preservatives used? If no, document on NOD.
- ☐ ☒ ☐ 8. pH of all samples checked and meet requirements? If no, document on NOD.
- ☐ ☐ ☐ 9. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
- ☒ ☐ ☐ 10. HF Dilution required?
- ☒ ☐ ☐ 11. Sufficient volume provided for all analysis and requested MS/MSD? If no, document on NOD and consult PM before proceeding.
- ☒ ☐ ☐ 12. Did chain of custody agree with samples received? If no, document on NOD.
- ☒ ☐ ☐ 13. Were VOA samples received without headspace?
- ☐ ☒ ☐ 14. Did samples require preservation with sodium thiosulfate?
- ☒ ☐ ☐ 15. If yes to #14, was the residual chlorine test negative? If no, document on NOD.
- ☒ ☐ ☐ 16. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
- ☒ ☐ ☐ 17. Are analyses with short holding times received in hold?
- ☐ ☒ ☐ 18. Were special log- in instructions read and followed?

Checklist Reviewed: _____ Log-in initials: jm Labeler initials: jm

Event 2: March 23, 2011



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 Basin S-1 Stormwater Sampling Event 2

To: File
From: Andrew Davidson, GSI Water Solutions, Inc. (GSI)
Date: May 26, 2011

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated from a source control investigation sampling event conducted by the City of Portland (City) in Basin S-1 on March 23, 2011. Three stormwater samples (W11C196-01, W11C196-02, W11C196-03) were collected and submitted for analyses.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontracted laboratory. The following laboratories conducted the analyses listed:

- BES WPCL
 - Total Suspended Solids – SM 2540D
 - Total Metals – EPA 200.8
 - Polycyclic Aromatic Hydrocarbons (PAHs) and Phthalates – EPA 8270-SIM
 - Polychlorinated Biphenyl (PCB) Aroclors – EPA 8082
- Test America (TA)
 - Total Organic Carbon – SM 5310C

The WPCL laboratory report and the subcontracted laboratory reports for all analyses associated with this sampling event are attached.

The following QA/QC review of the analytical data is based on the available documentation provided by WPCL and the subcontracted laboratories. The QA/QC review of the analytical data consisted of reviewing the following elements for each laboratory report, if applicable and/or available:

- Chain-of-custody – for completeness and continuous custody
- Analysis conducted within holding times
- Chemicals of interest detected in method blanks

- Surrogate and/or internal standard recoveries within laboratory control limits
- Matrix spike and matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control and duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits
- Relative percent differences (RPDs) for duplicate samples within laboratory control limits

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

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

Samples for all analyses were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the laboratory analyses of total metals, PAHs/phthalates, PCB Aroclors, and TOC. No analytes were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries were completed during the laboratory analyses of PAHs/phthalates and PCB Aroclors. All surrogate recoveries were within laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

MS and/or MSD samples were processed during the laboratory analyses of total metals, PAHs/phthalates, and TOC. All percent recoveries and RPDs were within laboratory control limits.

Laboratory Control Sample/Laboratory Control Sample Duplicate

LC and/or DLC samples were processed during the laboratory analyses of TSS, total metals, PAHs/phthalates, PCB Aroclors, and TOC. All LC sample recoveries, DLC sample recoveries, and LC/DLC RPDs were within laboratory control limits.

Duplicate Samples

Duplicate samples were processed during the laboratory analyses of TSS, total metals, and TOC. All RPDs for relevant duplicate samples were within laboratory control limits.

Other

The WPCL included a case narrative for PCB analysis that states “Sample-01 (S1_SW1) appeared to have a trace amount of Aroclor that exhibited the same chromatographic pattern as in sample-03 (S1_SW3).” Aroclor 1260 was detected in sample S1_SW3: W11C196-03.



City of Portland
Water Pollution Control Laboratory

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



April 12, 2011

Linda Scheffler
Director's Office

Work Order
W11C196

Project
Portland Harbor

Received
03/24/11 08:30

Enclosed are the results of analysis for the above work order. If you have questions concerning this report, please contact your project coordinator Peter Abrams at 503-823-5533.

Renee Chauvin
Laboratory Coordinator QA/QC



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



LABORATORY ANALYSIS REPORT

Project:	Portland Harbor	Client:	Director's Office
Work Order:	W11C196	Project Mgr:	Linda Scheffler
Received:	3/24/11 8:30	WQDB #:	Janus329
Submitted By:	Field Operations		

Sample	Laboratory ID	Matrix	Type	Sample Collection Date		Qualifier
				Start	End	
S1_SW1	W11C196-01	Stormwater	Grab	03/23/11 22:16	03/23/11 22:16	
S1_SW2	W11C196-02	Stormwater	Grab	03/23/11 21:45	03/23/11 21:45	
S1_SW3	W11C196-03	Stormwater	Grab	03/23/11 22:03	03/23/11 22:03	

Case Narrative

PCB Analysis:

Sample -01 (S1_SW1) appeared to have a trace amount of Aroclor that exhibited the same chromatographic pattern as in sample -03 (S1_SW3).

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
---------	--------	-------	-----	-----	----------	-------	----------	----------	--------	-----------

General Chemistry

Total Suspended Solids

S1_SW1 : W11C196-01										
Total suspended solids	36	mg/L		2		B11C384	03/24/11	03/24/11	SM 2540D	
S1_SW2 : W11C196-02										
Total suspended solids	33	mg/L		2		B11C384	03/24/11	03/24/11	SM 2540D	
S1_SW3 : W11C196-03										
Total suspended solids	76	mg/L		2		B11C384	03/24/11	03/24/11	SM 2540D	

Total Metals

Total Metals by ICPMS

S1_SW1 : W11C196-01										
Copper	26.0	ug/L	0.200	1		B11C391	03/25/11	03/25/11	EPA 200.8	
Zinc	361	ug/L	0.500	1		B11C391	03/25/11	03/25/11	EPA 200.8	
S1_SW2 : W11C196-02										
Copper	27.5	ug/L	0.200	1		B11C391	03/25/11	03/25/11	EPA 200.8	
Zinc	342	ug/L	0.500	1		B11C391	03/25/11	03/25/11	EPA 200.8	
S1_SW3 : W11C196-03										
Copper	33.7	ug/L	0.200	1		B11C391	03/25/11	03/25/11	EPA 200.8	
Zinc	305	ug/L	0.500	1		B11C391	03/25/11	03/25/11	EPA 200.8	

Reported: 04/12/11 08:06

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11C196**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
---------	--------	-------	-----	-----	----------	-------	----------	----------	--------	-----------

Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW1 : W11C196-01

Acenaphthene	0.32	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Acenaphthylene	0.16	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Anthracene	0.89	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(a)anthracene	3.8	ug/L	0.10	0.10	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(a)pyrene	4.6	ug/L	0.10	0.10	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(b)fluoranthene	6.1	ug/L	0.10	0.10	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(g,h,i)perylene	3.0	ug/L	0.10	0.10	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(k)fluoranthene	2.3	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Chrysene	4.5	ug/L	0.10	0.10	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	1.1	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Fluoranthene	7.4	ug/L	0.10	0.10	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Fluorene	0.19	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	2.8	ug/L	0.10	0.10	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
1-Methylnaphthalene	0.039	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
2-Methylnaphthalene	0.039	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Naphthalene	0.048	ug/L	0.040	0.040	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Phenanthrene	2.6	ug/L	0.20	0.20	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Pyrene	7.6	ug/L	0.10	0.10	10	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	1.9	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM

Surrogate

Result

Expected

%Rec

Limits(%)

2-Methylnaphthalene-d10	0.19	0.216	88%	44-131	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Fluoranthene-d10	0.22	0.216	102%	54-150	B11C453	03/30/11	03/31/11	EPA 8270-SIM

S1_SW2 : W11C196-02

Acenaphthene	ND	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Acenaphthylene	ND	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Anthracene	ND	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(a)anthracene	0.031	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(a)pyrene	0.035	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(b)fluoranthene	0.051	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(g,h,i)perylene	0.037	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(k)fluoranthene	0.016	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Chrysene	0.047	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Fluoranthene	0.088	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Fluorene	ND	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM

Reported: 04/12/11 08:06

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11C196**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW2 : W11C196-02

Indeno(1,2,3-cd)pyrene	0.025	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
1-Methylnaphthalene	0.023	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
2-Methylnaphthalene	0.030	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.040	0.040	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Phenanthrene	0.052	ug/L	0.020	0.020	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Pyrene	0.091	ug/L	0.010	0.010	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	1.1	ug/L	0.50	1.0	1	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Surrogate	Result		Expected	%Rec	Limits(%)				
2-Methylnaphthalene-d10	0.17		0.216	79%	44-131	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Fluoranthene-d10	0.22		0.216	104%	54-150	B11C453	03/30/11	03/31/11	EPA 8270-SIM

S1_SW3 : W11C196-03

Acenaphthene	0.48	ug/L	0.060	0.060	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Acenaphthylene	0.28	ug/L	0.060	0.060	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Anthracene	1.4	ug/L	0.060	0.060	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(a)anthracene	7.0	ug/L	0.030	0.030	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(a)pyrene	8.7	ug/L	0.15	0.15	15	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(b)fluoranthene	12	ug/L	0.15	0.15	15	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(g,h,i)perylene	5.6	ug/L	0.030	0.030	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Benzo(k)fluoranthene	4.1	ug/L	0.15	0.15	15	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Chrysene	8.8	ug/L	0.15	0.15	15	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	1.8	ug/L	0.030	0.030	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Fluoranthene	14	ug/L	0.15	0.15	15	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Fluorene	0.29	ug/L	0.060	0.060	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	5.2	ug/L	0.030	0.030	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
1-Methylnaphthalene	ND	ug/L	0.060	0.060	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
2-Methylnaphthalene	ND	ug/L	0.060	0.060	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.12	0.12	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Phenanthrene	4.6	ug/L	0.060	0.060	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Pyrene	15	ug/L	0.15	0.15	15	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	1.5	3.0	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	1.5	3.0	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	1.5	3.0	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	1.5	3.0	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	1.5	3.0	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	3.3	ug/L	1.5	3.0	3	B11C453	03/30/11	03/31/11	EPA 8270-SIM

Reported: 04/12/11 08:06

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11C196**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW3 : W11C196-03

D1

Surrogate	Result	Expected	%Rec	Limits(%)					
2-Methylnaphthalene-d10	0.20	0.216	92%	44-131	B11C453	03/30/11	03/31/11	EPA 8270-SIM	
Fluoranthene-d10	0.19	0.216	90%	54-150	B11C453	03/30/11	03/31/11	EPA 8270-SIM	

Reported: 04/12/11 08:06

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Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

S1_SW1 : W11C196-01

N

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082

Surrogate	Result	Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0307	0.0500	61%	41-107.6	B11C423	03/28/11	03/28/11	EPA 8082
Decachlorobiphenyl	0.0598	0.0500	120%	8.3-153	B11C423	03/28/11	03/28/11	EPA 8082

S1_SW2 : W11C196-02

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082

Surrogate	Result	Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0345	0.0495	70%	41-107.6	B11C423	03/28/11	03/28/11	EPA 8082
Decachlorobiphenyl	0.0385	0.0495	78%	8.3-153	B11C423	03/28/11	03/28/11	EPA 8082

S1_SW3 : W11C196-03

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1260	0.0413	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11C423	03/28/11	03/28/11	EPA 8082

Surrogate	Result	Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0371	0.0513	72%	41-107.6	B11C423	03/28/11	03/28/11	EPA 8082
Decachlorobiphenyl	0.0462	0.0513	90%	8.3-153	B11C423	03/28/11	03/28/11	EPA 8082

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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11C196**

Client: Director's Office
Project Mgr: Linda Scheffler

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Suspended Solids - Batch B11C384										
LCS (B11C384-BS1)										
Total suspended solids	95	mg/L			100		95 (90-110)		03/24/11 :03/24/11	
Duplicate (B11C384-DUP1) Source: W11C194-03										
Total suspended solids	74	mg/L		2		71	4 (20)		03/24/11 :03/24/11	
Duplicate (B11C384-DUP2) Source: W11C196-01										
Total suspended solids	36	mg/L		2		36	0 (20)		03/24/11 :03/24/11	

Total Metals - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Metals by ICPMS - Batch B11C391										
Blank (B11C391-BLK1)										
Copper	ND	ug/L		0.200					03/25/11 :03/25/11	
Zinc	ND	ug/L		0.500					03/25/11 :03/25/11	
LCS (B11C391-BS1)										
Copper	5.24	ug/L		0.200	5.00		105 (85-115)		03/25/11 :03/25/11	
Zinc	25.3	ug/L		0.500	25.0		101 (85-115)		03/25/11 :03/25/11	
Duplicate (B11C391-DUP1) Source: W11C188-02										
Copper	1.17	ug/L		0.200		1.19	2 (20)		03/25/11 :03/25/11	
Zinc	4.67	ug/L		0.500		4.67	0.02 (20)		03/25/11 :03/25/11	
Matrix Spike (B11C391-MS1) Source: W11C188-02										
Copper	6.18	ug/L		0.200	5.00	1.19	100 (70-130)		03/25/11 :03/25/11	
Zinc	29.2	ug/L		0.500	25.0	4.67	98 (70-130)		03/25/11 :03/25/11	

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Project: **Portland Harbor**
Work Order: **W11C196**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11C453

Blank (B11C453-BLK1)

Acenaphthene	ND	ug/L	0.020	0.020					03/30/11 :03/31/11	
Acenaphthylene	ND	ug/L	0.020	0.020					03/30/11 :03/31/11	
Anthracene	ND	ug/L	0.020	0.020					03/30/11 :03/31/11	
Benzo(a)anthracene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Benzo(a)pyrene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Chrysene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Fluoranthene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Fluorene	ND	ug/L	0.020	0.020					03/30/11 :03/31/11	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
1-Methylnaphthalene	ND	ug/L	0.020	0.020					03/30/11 :03/31/11	
2-Methylnaphthalene	ND	ug/L	0.020	0.020					03/30/11 :03/31/11	
Naphthalene	ND	ug/L	0.040	0.040					03/30/11 :03/31/11	
Phenanthrene	ND	ug/L	0.020	0.020					03/30/11 :03/31/11	
Pyrene	ND	ug/L	0.010	0.010					03/30/11 :03/31/11	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0					03/30/11 :03/31/11	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0					03/30/11 :03/31/11	
Diethyl phthalate	ND	ug/L	0.50	1.0					03/30/11 :03/31/11	
Dimethyl phthalate	ND	ug/L	0.50	1.0					03/30/11 :03/31/11	
Di-n-octyl phthalate	ND	ug/L	0.50	1.0					03/30/11 :03/31/11	
Bis(2-ethylhexyl) phthalate	ND	ug/L	0.50	1.0					03/30/11 :03/31/11	

Surrogate

2-Methylnaphthalene-d10	0.19			ug/L	0.216	89		03/30/11 :03/31/11	
Fluoranthene-d10	0.24			ug/L	0.216	110		03/30/11 :03/31/11	

LCS (B11C453-BS1)

Acenaphthene	0.0957	ug/L	0.020	0.020	0.108	88 (39-136)		03/30/11 :03/31/11	
Acenaphthylene	0.109	ug/L	0.020	0.020	0.108	101 (48-134)		03/30/11 :03/31/11	
Anthracene	0.117	ug/L	0.020	0.020	0.108	108 (55-133)		03/30/11 :03/31/11	
Benzo(a)anthracene	0.111	ug/L	0.010	0.010	0.108	102 (53-140)		03/30/11 :03/31/11	
Benzo(a)pyrene	0.101	ug/L	0.010	0.010	0.108	94 (42-135)		03/30/11 :03/31/11	
Benzo(b)fluoranthene	0.104	ug/L	0.010	0.010	0.108	96 (46-137)		03/30/11 :03/31/11	
Benzo(g,h,i)perylene	0.113	ug/L	0.010	0.010	0.108	104 (32-142)		03/30/11 :03/31/11	
Benzo(k)fluoranthene	0.103	ug/L	0.010	0.010	0.108	95 (46-128)		03/30/11 :03/31/11	
Chrysene	0.111	ug/L	0.010	0.010	0.108	102 (64-142)		03/30/11 :03/31/11	
Dibenzo(a,h)anthracene	0.118	ug/L	0.010	0.010	0.108	110 (32-144)		03/30/11 :03/31/11	
Fluoranthene	0.120	ug/L	0.010	0.010	0.108	111 (57-142)		03/30/11 :03/31/11	
Fluorene	0.105	ug/L	0.020	0.020	0.108	98 (50-135)		03/30/11 :03/31/11	

Reported: 04/12/11 08:06

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11C196**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11C453

LCS (B11C453-BS1)

Indeno(1,2,3-cd)pyrene	0.115	ug/L	0.010	0.010	0.108		106 (33-143)		03/30/11 :03/31/11	
Naphthalene	0.103	ug/L	0.040	0.040	0.108		95 (46-157)		03/30/11 :03/31/11	
Phenanthrene	0.114	ug/L	0.020	0.020	0.108		105 (57-137)		03/30/11 :03/31/11	
Pyrene	0.114	ug/L	0.010	0.010	0.108		106 (59-136)		03/30/11 :03/31/11	
Butyl benzyl phthalate	1.37	ug/L	0.50	1.0	1.08		127 (66-152)		03/30/11 :03/31/11	
Di-n-butyl phthalate	1.33	ug/L	0.50	1.0	1.08		123 (73-157)		03/30/11 :03/31/11	
Diethyl phthalate	1.38	ug/L	0.50	1.0	1.08		128 (62-166)		03/30/11 :03/31/11	
Dimethyl phthalate	1.33	ug/L	0.50	1.0	1.08		123 (60-157)		03/30/11 :03/31/11	
Di-n-octyl phthalate	1.27	ug/L	0.50	1.0	1.08		118 (27-173)		03/30/11 :03/31/11	
Bis(2-ethylhexyl) phthalate	1.34	ug/L	0.50	1.0	1.08		124 (29-185)		03/30/11 :03/31/11	

Surrogate

2-Methylnaphthalene-d10	0.21			ug/L	0.216		96 (44-131)		03/30/11 :03/31/11	
Fluoranthene-d10	0.25			ug/L	0.216		116 (54-150)		03/30/11 :03/31/11	

Matrix Spike (B11C453-MS1)

Source: W11C220-08

Acenaphthene	0.263	ug/L	0.020	0.020	0.270	ND	97 (39-136)		03/30/11 :03/31/11	
Acenaphthylene	0.293	ug/L	0.020	0.020	0.270	0.0205	101 (48-134)		03/30/11 :03/31/11	
Anthracene	0.316	ug/L	0.020	0.020	0.270	ND	117 (55-133)		03/30/11 :03/31/11	
Benzo(a)anthracene	0.312	ug/L	0.010	0.010	0.270	0.0222	107 (53-140)		03/30/11 :03/31/11	
Benzo(a)pyrene	0.296	ug/L	0.010	0.010	0.270	0.0297	99 (42-135)		03/30/11 :03/31/11	
Benzo(b)fluoranthene	0.314	ug/L	0.010	0.010	0.270	0.0443	100 (46-137)		03/30/11 :03/31/11	
Benzo(g,h,i)perylene	0.387	ug/L	0.010	0.010	0.270	0.0859	111 (32-142)		03/30/11 :03/31/11	
Benzo(k)fluoranthene	0.275	ug/L	0.010	0.010	0.270	0.0130	97 (46-128)		03/30/11 :03/31/11	
Chrysene	0.330	ug/L	0.010	0.010	0.270	0.0449	106 (32-142)		03/30/11 :03/31/11	
Dibenzo(a,h)anthracene	0.335	ug/L	0.010	0.010	0.270	0.0135	119 (32-144)		03/30/11 :03/31/11	
Fluoranthene	0.372	ug/L	0.010	0.010	0.270	0.0784	109 (57-142)		03/30/11 :03/31/11	
Fluorene	0.284	ug/L	0.020	0.020	0.270	ND	105 (50-135)		03/30/11 :03/31/11	
Indeno(1,2,3-cd)pyrene	0.341	ug/L	0.010	0.010	0.270	0.0303	115 (33-143)		03/30/11 :03/31/11	
Naphthalene	0.294	ug/L	0.040	0.040	0.270	0.0514	90 (46-157)		03/30/11 :03/31/11	
Phenanthrene	0.330	ug/L	0.020	0.020	0.270	0.0568	101 (57-137)		03/30/11 :03/31/11	
Pyrene	0.400	ug/L	0.010	0.010	0.270	0.122	103 (59-136)		03/30/11 :03/31/11	
Butyl benzyl phthalate	3.45	ug/L	0.50	1.0	2.70	ND	128 (66-152)		03/30/11 :03/31/11	
Di-n-butyl phthalate	3.28	ug/L	0.50	1.0	2.70	ND	121 (73-157)		03/30/11 :03/31/11	
Diethyl phthalate	3.33	ug/L	0.50	1.0	2.70	ND	123 (62-166)		03/30/11 :03/31/11	
Dimethyl phthalate	3.27	ug/L	0.50	1.0	2.70	ND	121 (60-157)		03/30/11 :03/31/11	
Di-n-octyl phthalate	3.89	ug/L	0.50	1.0	2.70	0.581	123 (27-173)		03/30/11 :03/31/11	
Bis(2-ethylhexyl) phthalate	6.29	ug/L	0.50	1.0	2.70	3.25	113 (29-185)		03/30/11 :03/31/11	

Surrogate

2-Methylnaphthalene-d10	0.26			ug/L	0.324		79 (44-131)		03/30/11 :03/31/11	
Fluoranthene-d10	0.31			ug/L	0.324		95 (54-150)		03/30/11 :03/31/11	

Matrix Spike Dup (B11C453-MSD1)

Source: W11C220-08

Reported: 04/12/11 08:06

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11C196**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11C453										
Matrix Spike Dup (B11C453-MSD1)			Source: W11C220-08							
Acenaphthene	0.257	ug/L	0.020	0.020	0.270	ND	95 (39-136)	2 (50)	03/30/11 :03/31/11	
Acenaphthylene	0.284	ug/L	0.020	0.020	0.270	0.0205	97 (48-134)	3 (50)	03/30/11 :03/31/11	
Anthracene	0.298	ug/L	0.020	0.020	0.270	ND	110 (55-133)	6 (50)	03/30/11 :03/31/11	
Benzo(a)anthracene	0.291	ug/L	0.010	0.010	0.270	0.0222	100 (53-140)	7 (50)	03/30/11 :03/31/11	
Benzo(a)pyrene	0.277	ug/L	0.010	0.010	0.270	0.0297	92 (42-135)	7 (50)	03/30/11 :03/31/11	
Benzo(b)fluoranthene	0.288	ug/L	0.010	0.010	0.270	0.0443	90 (46-137)	9 (50)	03/30/11 :03/31/11	
Benzo(g,h,i)perylene	0.359	ug/L	0.010	0.010	0.270	0.0859	101 (32-142)	7 (50)	03/30/11 :03/31/11	
Benzo(k)fluoranthene	0.259	ug/L	0.010	0.010	0.270	0.0130	91 (46-128)	6 (50)	03/30/11 :03/31/11	
Chrysene	0.304	ug/L	0.010	0.010	0.270	0.0449	96 (32-142)	8 (50)	03/30/11 :03/31/11	
Dibenzo(a,h)anthracene	0.311	ug/L	0.010	0.010	0.270	0.0135	110 (32-144)	8 (50)	03/30/11 :03/31/11	
Fluoranthene	0.352	ug/L	0.010	0.010	0.270	0.0784	101 (57-142)	6 (50)	03/30/11 :03/31/11	
Fluorene	0.270	ug/L	0.020	0.020	0.270	ND	100 (50-135)	5 (50)	03/30/11 :03/31/11	
Indeno(1,2,3-cd)pyrene	0.315	ug/L	0.010	0.010	0.270	0.0303	105 (33-143)	8 (50)	03/30/11 :03/31/11	
Naphthalene	0.290	ug/L	0.040	0.040	0.270	0.0514	88 (46-157)	1 (50)	03/30/11 :03/31/11	
Phenanthrene	0.312	ug/L	0.020	0.020	0.270	0.0568	94 (57-137)	6 (50)	03/30/11 :03/31/11	
Pyrene	0.377	ug/L	0.010	0.010	0.270	0.122	94 (59-136)	6 (50)	03/30/11 :03/31/11	
Butyl benzyl phthalate	3.17	ug/L	0.50	1.0	2.70	ND	117 (66-152)	8 (50)	03/30/11 :03/31/11	
Di-n-butyl phthalate	3.04	ug/L	0.50	1.0	2.70	ND	112 (73-157)	8 (50)	03/30/11 :03/31/11	
Diethyl phthalate	3.19	ug/L	0.50	1.0	2.70	ND	118 (62-166)	4 (50)	03/30/11 :03/31/11	
Dimethyl phthalate	3.17	ug/L	0.50	1.0	2.70	ND	117 (60-157)	3 (50)	03/30/11 :03/31/11	
Di-n-octyl phthalate	3.55	ug/L	0.50	1.0	2.70	0.581	110 (27-173)	9 (50)	03/30/11 :03/31/11	
Bis(2-ethylhexyl) phthalate	5.86	ug/L	0.50	1.0	2.70	3.25	97 (29-185)	7 (50)	03/30/11 :03/31/11	
Surrogate										
2-Methylnaphthalene-d10	0.27			ug/L	0.324		82 (44-131)		03/30/11 :03/31/11	
Fluoranthene-d10	0.29			ug/L	0.324		90 (54-150)		03/30/11 :03/31/11	

Reported: 04/12/11 08:06

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11C196**

Client: Director's Office
Project Mgr: Linda Scheffler

Polychlorinated Biphenyls (PCBs) - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
PCB Aroclors by GC-ECD - Batch B11C423										
Blank (B11C423-BLK1)										
Aroclor 1016/1242	ND	ug/L		0.0250					03/28/11 :03/28/11	
Aroclor 1221	ND	ug/L		0.0500					03/28/11 :03/28/11	
Aroclor 1232	ND	ug/L		0.0250					03/28/11 :03/28/11	
Aroclor 1248	ND	ug/L		0.0250					03/28/11 :03/28/11	
Aroclor 1254	ND	ug/L		0.0250					03/28/11 :03/28/11	
Aroclor 1260	ND	ug/L		0.0250					03/28/11 :03/28/11	
Aroclor 1262	ND	ug/L		0.0250					03/28/11 :03/28/11	
Aroclor 1268	ND	ug/L		0.0250					03/28/11 :03/28/11	
Surrogate										
Tetrachloro-m-xylene	0.0292			ug/L	0.0500		58		03/28/11 :03/28/11	
Decachlorobiphenyl	0.0503			ug/L	0.0500		101		03/28/11 :03/28/11	
LCS (B11C423-BS1)										
Aroclor 1016/1242	0.09722	ug/L		0.0250	0.125		78 (64-122)		03/28/11 :03/28/11	
Aroclor 1260	0.1209	ug/L		0.0250	0.125		97 (66-122)		03/28/11 :03/28/11	
Surrogate										
Tetrachloro-m-xylene	0.0308			ug/L	0.0500		62 (41-107.6)		03/28/11 :03/28/11	
Decachlorobiphenyl	0.0505			ug/L	0.0500		101 (8.3-153)		03/28/11 :03/28/11	
LCS Dup (B11C423-BSD1)										
Aroclor 1016/1242	0.1067	ug/L		0.0250	0.125		85 (64-122)	9 (20)	03/28/11 :03/28/11	
Aroclor 1260	0.1230	ug/L		0.0250	0.125		98 (66-122)	2 (20)	03/28/11 :03/28/11	
Surrogate										
Tetrachloro-m-xylene	0.0323			ug/L	0.0500		65 (41-107.6)		03/28/11 :03/28/11	
Decachlorobiphenyl	0.0525			ug/L	0.0500		105 (8.3-153)		03/28/11 :03/28/11	

Qualifiers

D1 The sample required dilution due to non-target matrix interferences, resulting in raised reporting limits.
N Refer to case narrative.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference

Reported: 04/12/11 08:06

Renee Chauvin, Laboratory Coordinator QA/QC

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City of Portland
Chain-of-Custody



Bureau of Environmental Services

Date: 3/23/11

Work Order #: W11C196

Collected By: CJK, JXB

Client Name: Director's Office

Project Name: Portland Harbor

Matrix: Stormwater

Requested Analyses

Requested Analyses

Special Instructions:														
Basin S-1 Stormwater														
1Includes 1 & 2 Methylene														
Lab Number														
Location ID														
Sample Date														
Sample Time														
Sample Type														
S1_SW1														
S1_SW2														
S1_SW3														
DUP														

Received By: [Signature]
Date: 3/24/11
Time: 0830

Relinquished By: [Signature]
Date: 3/24/11
Time: 0830

Received By: [Signature]
Date: [Blank]
Time: [Blank]

Relinquished By: [Signature]
Date: [Blank]
Time: [Blank]

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Tel: (503) 906-9200

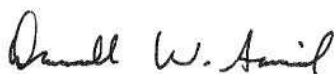
TestAmerica Job ID: PUC0821

Client Project/Site: W11C196
Client Project Description: Portland Harbor

For:

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

Attn: Renee Chauvin



Authorized for release by:
04/11/2011 02:57:08 PM

Darrell Auvil
Project Manager
darrell.auvil@testamericainc.com

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Visit us at:

www.testamericainc.com

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all 2003 NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Sample Summary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11C196

TestAmerica Job ID: PUC0821

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
PUC0821-01	W11C196-01 (S1_SW1)	Stormwater	03/23/11 22:16	03/24/11 13:35
PUC0821-02	W11C196-02 (S1_SW2)	Stormwater	03/23/11 21:45	03/24/11 13:35
PUC0821-03	W11C196-03 (S1_SW3)	Stormwater	03/23/11 22:03	03/24/11 13:35

- 1
- 2
- 3
- 4
- 5
- 6

Qualifier Definition/Glossary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11C196

TestAmerica Job ID: PUC0821

Qualifiers

Wet Chem

Qualifier	Qualifier Description
R4	Due to the low levels of analyte in the sample, the duplicate RPD calculation does not provide useful information.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.
EPA	United States Environmental Protection Agency
ND	Not Detected above the reporting level.
MDL	Method Detection Limit
RL	Reporting Limit
RE, RE1 (etc.)	Indicates a Re-extraction or Reanalysis of the sample.
%R	Percent Recovery
RPD	Relative Percent Difference, a measure of the relative difference between two points.

Analytical Data

Client: City of Portland Water Pollution Laboratory
Project/Site: W11C196

TestAmerica Job ID: PUC0821

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Client Sample ID: W11C196-01 (S1_SW1)

Date Collected: 03/23/11 22:16

Date Received: 03/24/11 13:35

Sampler Name: _FO

Lab Sample ID: PUC0821-01

Matrix: Stormwater

Sampler Phone Number: (503) 823-5612

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3.29		1.00		mg/l		03/25/11 15:06	03/25/11 21:44	1.00

Client Sample ID: W11C196-02 (S1_SW2)

Date Collected: 03/23/11 21:45

Date Received: 03/24/11 13:35

Sampler Name: _FO

Lab Sample ID: PUC0821-02

Matrix: Stormwater

Sampler Phone Number: (503) 823-5612

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.18		1.00		mg/l		03/25/11 15:06	03/25/11 21:44	1.00

Client Sample ID: W11C196-03 (S1_SW3)

Date Collected: 03/23/11 22:03

Date Received: 03/24/11 13:35

Sampler Name: _FO

Lab Sample ID: PUC0821-03

Matrix: Stormwater

Sampler Phone Number: (503) 823-5612

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	4.43		1.00		mg/l		03/31/11 09:13	03/31/11 19:16	1.00

Quality Control Data

Client: City of Portland Water Pollution Laboratory
Project/Site: W11C196

TestAmerica Job ID: PUC0821

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Lab Sample ID: 11C0765-BLK1

Matrix: Water

Analysis Batch: 11C0765

Client Sample ID: 11C0765-BLK1

Prep Type: total

Prep Batch: 11C0765_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.00		mg/l		03/25/11 15:06	03/25/11 21:44	1.00

Lab Sample ID: 11C0765-BS1

Matrix: Water

Analysis Batch: 11C0765

Client Sample ID: 11C0765-BS1

Prep Type: total

Prep Batch: 11C0765_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	20.0	18.1		mg/l		90.6	85 - 115

Lab Sample ID: 11C0765-MS1

Matrix: Water

Analysis Batch: 11C0765

Client Sample ID: PUC0804-01

Prep Type: total

Prep Batch: 11C0765_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	0.235		25.0	23.6		mg/l		93.3	75 - 125

Lab Sample ID: 11C0765-DUP1

Matrix: Water

Analysis Batch: 11C0765

Client Sample ID: PUC0804-01

Prep Type: total

Prep Batch: 11C0765_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	0.235		0.438	R4	mg/l		60.2	20

Lab Sample ID: 11C0915-BLK1

Matrix: Water

Analysis Batch: 11C0915

Client Sample ID: 11C0915-BLK1

Prep Type: total

Prep Batch: 11C0915_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.00		mg/l		03/31/11 09:13	03/31/11 19:16	1.00

Lab Sample ID: 11C0915-BS1

Matrix: Water

Analysis Batch: 11C0915

Client Sample ID: 11C0915-BS1

Prep Type: total

Prep Batch: 11C0915_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	20.0	18.9		mg/l		94.5	85 - 115

Lab Sample ID: 11C0915-MS1

Matrix: Water

Analysis Batch: 11C0915

Client Sample ID: PUC0877-04

Prep Type: total

Prep Batch: 11C0915_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	4.19		25.0	29.1		mg/l		99.5	75 - 125

Lab Sample ID: 11C0915-DUP1

Matrix: Water

Analysis Batch: 11C0915

Client Sample ID: PUC0877-04

Prep Type: total

Prep Batch: 11C0915_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	4.19		4.16		mg/l		0.82	20

TestAmerica Portland

SUBCONTRACT ORDER
City of Portland Water Pollution Control Lab
W11C196

PUC0821

SENDING LABORATORY:

City of Portland Water Pollution Control Lab
6543 N. Burlington Ave
Portland, OR 97203
Phone: 503-823-5600
Fax: 503-823-5656

RECEIVING LABORATORY:

TestAmerica
9405 SW Nimbus Ave
Beaverton, OR 97008
Phone: (503) 906-9200
Fax: (503) 906-9210

Invoice To: Charles Lytle using P.O.# 30001516

WPCL Project Name

Portland Harbor

TURNAROUND REQUEST

☒

Standard

☐

Rush _ day(s)

Analysis

Due

Expires

Laboratory ID Comments

Sample ID: W11C196-01

Water

Sampled: 03/23/11 22:16

Out-TOC Water

04/07/11 17:00

04/20/11 22:16

Containers Supplied:

G amber 250ml H2SO4 (D)

Sample ID: W11C196-02

Water

Sampled: 03/23/11 21:45

Out-TOC Water

04/07/11 17:00

04/20/11 21:45

Containers Supplied:

G amber 250ml H2SO4 (D)

Sample ID: W11C196-03

Water

Sampled: 03/23/11 22:03

Out-TOC Water

04/07/11 17:00

04/20/11 22:03

Containers Supplied:

G amber 250ml H2SO4 (D)

Released By

Date

Received By

Date

Released By

Date

Received By

Date

Portland Sample Control Checklist

Work Order #: PUC0821 Date/Time Received: 3/24/11 1335
 Client Name: City of Portland
 Project Name: Wile 0196
 Time Zone: ☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☒ PDT/PST ☐ AK ☐ HI ☐ OTHER

Unpacking Checks:

Cooler (s): 1
 Temperature (s): 2

Digi #1 ☐ Digi #2 ☐ IR Gun ☒ (☐ Plastic ☒ Glass)

Raytek ☐ (☐ Plastic ☐ Glass)

Ice used: (circle one) GEL LOOSE BLUE NONE OTHER: _____ Initials: dm

N/A Yes No

- ☒ ☐ ☐ 1. If ESI client, were temp blanks received? If no, document on NOD.
- ☒ ☐ ☐ 2. Cooler Seals intact? (N/A if hand delivered) if no and ESI client, document on NOD.
- ☒ ☐ ☐ 3. Chain of Custody present? If no, document on NOD. Along with "received by" & "relinquished by" signatures with date & time?
- ☒ ☐ ☐ 4. Bottles received intact? If no, document on NOD.
- ☒ ☐ ☐ 5. Sample is not multiphasic? If no, document on NOD.
- ☐ ☒ ☐ 6. Sampler name/signature documented on COC?
- ☒ ☐ ☐ 7. Proper Container and preservatives used? If no, document on NOD.
- ☒ ☐ ☐ 8. pH of all samples checked and meet requirements? If no, document on NOD.
- ☒ ☐ ☐ 9. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
- ☒ ☐ ☐ 10. HF Dilution required?
- ☒ ☐ ☐ 11. Sufficient volume provided for all analysis and requested MS/MSD? If no, document on NOD and consult PM before proceeding.
- ☒ ☐ ☐ 12. Did chain of custody agree with samples received? If no, document on NOD.
- ☒ ☐ ☐ 13. Were VOA samples received without headspace?
- ☐ ☒ ☐ 14. Did samples require preservation with sodium thiosulfate?
- ☒ ☐ ☐ 15. If yes to #14, was the residual chlorine test negative? If no, document on NOD.
- ☒ ☐ ☐ 16. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
- ☐ ☐ ☐ 17. Are analyses with short holding times received in hold?
- ☐ ☒ ☐ 18. Were special log-in instructions read and followed?

Checklist Reviewed: _____ Log-in initials: dm Labeler initials: dm

Event 3: April 14, 2011



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 Basin S-1 Stormwater Sampling Event 3

To: File
From: Andrew Davidson, GSI Water Solutions, Inc. (GSI)
Date: May 25, 2011

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated from a source control investigation sampling event conducted by the City of Portland (City) in Basin S-1 on April 14, 2011. Six stormwater samples, including five field samples (W11D150-01 to W11D150-05) and one field duplicate sample (W11D150-06) were collected and submitted for analyses.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontracted laboratory. The following laboratories conducted the analyses listed:

- BES WPCL
 - Total Suspended Solids – SM 2540D
 - Total Metals – EPA 200.8
 - Polycyclic Aromatic Hydrocarbons (PAHs) and Phthalates – EPA 8270M-SIM
 - Polychlorinated Biphenyls (PCBs) – EPA 8082
- Test America (TA)
 - Total Organic Carbon – SM 5310C

The WPCL laboratory report and the subcontracted laboratory report for all analyses associated with this sampling event are attached.

The following QA/QC review of the analytical data is based on the available documentation provided by WPCL and the subcontracted laboratories. The QA/QC review of the analytical data consisted of reviewing the following elements for each laboratory report, if applicable and/or available:

- Chain-of-custody – for completeness and continuous custody
- Analysis conducted within holding times

- Chemicals of interest detected in method blanks
- Surrogate and/or internal standard recoveries within laboratory control limits
- Matrix spike and matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control and duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits
- Relative percent differences (RPDs) for duplicate samples within laboratory control limits

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

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

Samples for all analyses were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the laboratory analyses of metals, PAHs/phthalates, PCB Aroclors, and TOC. No analytes were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries were completed during the laboratory analyses of PAHs/phthalates and PCB Aroclors. All surrogate recoveries were within laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

MS and/or MSD samples were processed during the laboratory analyses of total metals, PAHs/phthalates, and TOC. All percent recoveries and RPDs were within laboratory control limits.

Laboratory Control Sample/Laboratory Control Sample Duplicate

LC samples were processed during the laboratory analyses of TSS, total metals, PAHs/phthalates, PCB Aroclors, and TOC. DLC samples were processed during the laboratory analyses of PAHs/phthalates and PCB Aroclors. LC/DLC sample recoveries and RPDs were within laboratory control limits for all analyses.

Laboratory Duplicate Samples

Laboratory duplicate samples were processed during the laboratory analysis of TSS, total metals, and TOC. All RPDs for duplicate samples were within laboratory control limits.

Other

During the PAH analysis, samples W11D150-02, W11D150-03, and W11D150-06 were analyzed at a dilution due to high levels of target analytes.

A field duplicate was obtained as part of the QA/QC program. Field sample W11D150-03 and its duplicate sample W11D150-06 were obtained at the same location (S1_SW4) in sequential time order. The analyte RPDs for the field and field duplicate sample were calculated and were below 10 percent showing high consistency between samples.



City of Portland
Water Pollution Control Laboratory

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



May 02, 2011

Linda Scheffler
Director's Office

Work Order
W11D150

Project
Portland Harbor

Received
04/14/11 09:55

Enclosed are the results of analysis for the above work order. If you have questions concerning this report, please contact your project coordinator Peter Abrams at 503-823-5533.

Renee Chauvin
Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



LABORATORY ANALYSIS REPORT

Project: **Portland Harbor**
Work Order: **W11D150**
Received: 4/14/11 9:55
Submitted By: Field Operations

Client: Director's Office
Project Mgr: Linda Scheffler
WQDB #: Janus329

Sample	Laboratory ID	Matrix	Type	Sample Collection Date		Qualifier
				Start	End	
S1_SW1	W11D150-01	Stormwater	Grab	04/14/11 09:20	04/14/11 09:20	
S1_SW3	W11D150-02	Stormwater	Grab	04/14/11 09:07	04/14/11 09:07	
S1_SW4	W11D150-03	Stormwater	Grab	04/14/11 08:59	04/14/11 08:59	
S1_SW5	W11D150-04	Stormwater	Grab	04/14/11 08:29	04/14/11 08:29	
S1_SW6	W11D150-05	Stormwater	Grab	04/14/11 08:46	04/14/11 08:46	
Field Duplicate	W11D150-06	Stormwater	Grab	04/14/11 00:00	04/14/11 00:00	

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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General Chemistry

Total Suspended Solids

S1_SW1 : W11D150-01										
Total suspended solids	38	mg/L		2		B11D233	04/14/11	04/15/11	SM 2540D	
S1_SW3 : W11D150-02										
Total suspended solids	97	mg/L		2		B11D233	04/14/11	04/15/11	SM 2540D	
S1_SW4 : W11D150-03										
Total suspended solids	212	mg/L		2		B11D233	04/14/11	04/15/11	SM 2540D	
S1_SW5 : W11D150-04										
Total suspended solids	4	mg/L		2		B11D233	04/14/11	04/15/11	SM 2540D	
S1_SW6 : W11D150-05										
Total suspended solids	10	mg/L		2		B11D233	04/14/11	04/15/11	SM 2540D	
Field Duplicate : W11D150-06										
Total suspended solids	218	mg/L		2		B11D233	04/14/11	04/15/11	SM 2540D	

Reported: 05/02/11 14:45

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Total Metals

Total Metals by ICPMS

S1_SW1 : W11D150-01

Copper	50.2	ug/L	0.200	1	B11D243	04/15/11	04/15/11	EPA 200.8
Zinc	395	ug/L	0.500	1	B11D243	04/15/11	04/15/11	EPA 200.8

S1_SW3 : W11D150-02

Copper	38.7	ug/L	0.200	1	B11D243	04/15/11	04/15/11	EPA 200.8
Zinc	335	ug/L	0.500	1	B11D243	04/15/11	04/15/11	EPA 200.8

S1_SW4 : W11D150-03

Copper	62.0	ug/L	0.200	1	B11D243	04/15/11	04/15/11	EPA 200.8
Zinc	582	ug/L	0.500	1	B11D243	04/15/11	04/15/11	EPA 200.8

S1_SW5 : W11D150-04

Copper	29.9	ug/L	0.200	1	B11D243	04/15/11	04/15/11	EPA 200.8
Zinc	319	ug/L	0.500	1	B11D243	04/15/11	04/15/11	EPA 200.8

S1_SW6 : W11D150-05

Copper	15.4	ug/L	0.200	1	B11D243	04/15/11	04/15/11	EPA 200.8
Zinc	93.9	ug/L	0.500	1	B11D243	04/15/11	04/15/11	EPA 200.8

Field Duplicate : W11D150-06

Copper	61.2	ug/L	0.200	1	B11D243	04/15/11	04/15/11	EPA 200.8
Zinc	571	ug/L	0.500	1	B11D243	04/15/11	04/15/11	EPA 200.8

Reported: 05/02/11 14:45

Renee Chauvin, Laboratory Coordinator QA/QC

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City of Portland
Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11D150**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW1 : W11D150-01

Acenaphthene	0.071	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Acenaphthylene	0.049	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Anthracene	0.22	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)anthracene	0.88	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)pyrene	0.95	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(b)fluoranthene	1.2	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(g,h,i)perylene	0.68	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(k)fluoranthene	0.47	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Chrysene	1.1	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	0.22	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene	1.9	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluorene	0.060	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	0.61	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
1-Methylnaphthalene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
2-Methylnaphthalene	0.021	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.040	0.040	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Phenanthrene	0.67	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Pyrene	2.0	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	2.5	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM

Surrogate

Result

Expected

%Rec

Limits(%)

2-Methylnaphthalene-d10	0.21	0.216	96%	44-131	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene-d10	0.25	0.216	117%	54-150	B11D281	04/18/11	04/20/11	EPA 8270-SIM

S1_SW3 : W11D150-02

D2

Acenaphthene	0.18	ug/L	0.040	0.040	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Acenaphthylene	0.11	ug/L	0.040	0.040	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Anthracene	0.55	ug/L	0.040	0.040	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)anthracene	2.3	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)pyrene	2.5	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(b)fluoranthene	3.4	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(g,h,i)perylene	1.8	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(k)fluoranthene	1.1	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Chrysene	2.8	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	0.58	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene	4.9	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluorene	0.13	ug/L	0.040	0.040	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM

Reported: 05/02/11 14:45

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW3 : W11D150-02

D2

Indeno(1,2,3-cd)pyrene	1.6	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
1-Methylnaphthalene	0.040	ug/L	0.040	0.040	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
2-Methylnaphthalene	ND	ug/L	0.040	0.040	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.080	0.080	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Phenanthrene	1.8	ug/L	0.040	0.040	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Pyrene	5.1	ug/L	0.020	0.020	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	1.0	2.0	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	1.0	2.0	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	1.0	2.0	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	1.0	2.0	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	1.0	2.0	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	3.2	ug/L	1.0	2.0	2	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Surrogate	Result		Expected	%Rec	Limits(%)				
2-Methylnaphthalene-d10	0.22		0.216	100%	44-131	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene-d10	0.26		0.216	118%	54-150	B11D281	04/18/11	04/20/11	EPA 8270-SIM

S1_SW4 : W11D150-03

D2

Acenaphthene	0.19	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Acenaphthylene	0.16	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Anthracene	0.69	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)anthracene	2.8	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)pyrene	3.0	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(b)fluoranthene	3.9	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(g,h,i)perylene	2.2	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(k)fluoranthene	1.6	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Chrysene	3.5	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	0.70	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene	6.1	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluorene	0.17	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	2.0	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
1-Methylnaphthalene	0.062	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
2-Methylnaphthalene	ND	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.12	0.12	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Phenanthrene	2.2	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Pyrene	6.7	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	5.1	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM

Reported: 05/02/11 14:45

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D150**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW4 : W11D150-03

D2

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.23	0.216	105%	44-131
Fluoranthene-d10	0.25	0.216	116%	54-150

S1_SW5 : W11D150-04

Acenaphthene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Acenaphthylene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Anthracene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)anthracene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)pyrene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Chrysene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene	0.018	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluorene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
1-Methylnaphthalene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
2-Methylnaphthalene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.040	0.040	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Phenanthrene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Pyrene	0.023	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	1.2	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.16	0.216	73%	44-131
Fluoranthene-d10	0.25	0.216	118%	54-150

S1_SW6 : W11D150-05

Acenaphthene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Acenaphthylene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Anthracene	0.024	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)anthracene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)pyrene	0.017	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(g,h,i)perylene	0.017	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(k)fluoranthene	0.054	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW6 : W11D150-05

Chrysene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene	0.023	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluorene	ND	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
1-Methylnaphthalene	0.036	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
2-Methylnaphthalene	0.035	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.040	0.040	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Phenanthrene	0.039	ug/L	0.020	0.020	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Pyrene	0.048	ug/L	0.010	0.010	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	2.6	ug/L	0.50	1.0	1	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Surrogate	Result		Expected	%Rec	Limits(%)				
2-Methylnaphthalene-d10	0.20		0.216	91%	44-131	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene-d10	0.23		0.216	104%	54-150	B11D281	04/18/11	04/20/11	EPA 8270-SIM

Field Duplicate : W11D150-06

Acenaphthene	0.21	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Acenaphthylene	0.17	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Anthracene	0.75	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)anthracene	2.9	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(a)pyrene	3.1	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(b)fluoranthene	4.1	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(g,h,i)perylene	2.2	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Benzo(k)fluoranthene	1.5	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Chrysene	3.7	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	0.72	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene	6.3	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluorene	0.17	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	2.0	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
1-Methylnaphthalene	0.060	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
2-Methylnaphthalene	ND	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.12	0.12	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Phenanthrene	2.3	ug/L	0.060	0.060	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Pyrene	6.8	ug/L	0.030	0.030	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM

Reported: 05/02/11 14:45

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Renee Chauvin, Laboratory Coordinator QA/QC



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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

Field Duplicate : W11D150-06

D2

Diethyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	5.0	ug/L	1.5	3.0	3	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Surrogate	Result		Expected	%Rec	Limits(%)				
2-Methylnaphthalene-d10	0.23		0.216	104%	44-131	B11D281	04/18/11	04/20/11	EPA 8270-SIM
Fluoranthene-d10	0.24		0.216	112%	54-150	B11D281	04/18/11	04/20/11	EPA 8270-SIM

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Project: **Portland Harbor**
Work Order: **W11D150**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

S1_SW1 : W11D150-01

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)			
Tetrachloro-m-xylene	0.0339		0.0490	69%	41-107.6	B11D313	04/20/11	04/20/11 EPA 8082
Decachlorobiphenyl	0.0426		0.0490	87%	8.3-153	B11D313	04/20/11	04/20/11 EPA 8082

S1_SW3 : W11D150-02

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1260	0.0372	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)			
Tetrachloro-m-xylene	0.0386		0.0490	79%	41-107.6	B11D313	04/20/11	04/20/11 EPA 8082
Decachlorobiphenyl	0.0470		0.0490	96%	8.3-153	B11D313	04/20/11	04/20/11 EPA 8082

S1_SW4 : W11D150-03

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1260	0.0618	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)			
Tetrachloro-m-xylene	0.0379		0.0490	77%	41-107.6	B11D313	04/20/11	04/20/11 EPA 8082
Decachlorobiphenyl	0.0581		0.0490	119%	8.3-153	B11D313	04/20/11	04/20/11 EPA 8082

S1_SW5 : W11D150-04

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082

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Project: **Portland Harbor**
Work Order: **W11D150**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

S1_SW5 : W11D150-04

Aroclor 1248	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1254	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1260	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1262	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1268	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0281		0.0490	57%	41-107.6	B11D313	04/20/11	04/20/11	EPA 8082
Decachlorobiphenyl	0.0336		0.0490	69%	8.3-153	B11D313	04/20/11	04/20/11	EPA 8082

S1_SW6 : W11D150-05

Aroclor 1016/1242	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1221	ND	ug/L		0.0500	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1232	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1248	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1254	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1260	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1262	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1268	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0369		0.0495	74%	41-107.6	B11D313	04/20/11	04/20/11	EPA 8082
Decachlorobiphenyl	0.0466		0.0495	94%	8.3-153	B11D313	04/20/11	04/20/11	EPA 8082

Field Duplicate : W11D150-06

Aroclor 1016/1242	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1221	ND	ug/L		0.0500	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1232	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1248	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1254	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1260	0.0675	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1262	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Aroclor 1268	ND	ug/L		0.0250	1	B11D313	04/20/11	04/20/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0401		0.0490	82%	41-107.6	B11D313	04/20/11	04/20/11	EPA 8082
Decachlorobiphenyl	0.0668		0.0490	136%	8.3-153	B11D313	04/20/11	04/20/11	EPA 8082

Reported: 05/02/11 14:45

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Renee Chauvin, Laboratory Coordinator QA/QC



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



Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Suspended Solids - Batch B11D233										
LCS (B11D233-BS1)										
Total suspended solids	95	mg/L			100		95 (90-110)		04/14/11 :04/15/11	
Duplicate (B11D233-DUP1) Source: W11D150-02										
Total suspended solids	100	mg/L			2	97	3 (20)		04/14/11 :04/15/11	

Total Metals - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Metals by ICPMS - Batch B11D243										
Blank (B11D243-BLK1)										
Copper	ND	ug/L		0.200					04/15/11 :04/15/11	
Zinc	ND	ug/L		0.500					04/15/11 :04/15/11	
LCS (B11D243-BS1)										
Copper	10.8	ug/L		0.200	10.0		108 (85-115)		04/15/11 :04/15/11	
Zinc	49.1	ug/L		0.500	50.0		98 (85-115)		04/15/11 :04/15/11	
Duplicate (B11D243-DUP1) Source: W11D134-01										
Copper	23.1	ug/L		0.200		23.0	0.4 (20)		04/15/11 :04/15/11	
Zinc	86.4	ug/L		0.500		86.6	0.3 (20)		04/15/11 :04/15/11	
Matrix Spike (B11D243-MS1) Source: W11D134-01										
Copper	34.1	ug/L		0.200	10.0	23.0	111 (70-130)		04/15/11 :04/15/11	
Zinc	136	ug/L		0.500	50.0	86.6	99 (70-130)		04/15/11 :04/15/11	

Reported: 05/02/11 14:45

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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11D281

Blank (B11D281-BLK1)

Acenaphthene	ND	ug/L	0.020	0.020					04/18/11 :04/20/11	
Acenaphthylene	ND	ug/L	0.020	0.020					04/18/11 :04/20/11	
Anthracene	ND	ug/L	0.020	0.020					04/18/11 :04/20/11	
Benzo(a)anthracene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Benzo(a)pyrene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Chrysene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Fluoranthene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Fluorene	ND	ug/L	0.020	0.020					04/18/11 :04/20/11	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
1-Methylnaphthalene	ND	ug/L	0.020	0.020					04/18/11 :04/20/11	
2-Methylnaphthalene	ND	ug/L	0.020	0.020					04/18/11 :04/20/11	
Naphthalene	ND	ug/L	0.040	0.040					04/18/11 :04/20/11	
Phenanthrene	ND	ug/L	0.020	0.020					04/18/11 :04/20/11	
Pyrene	ND	ug/L	0.010	0.010					04/18/11 :04/20/11	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0					04/18/11 :04/20/11	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0					04/18/11 :04/20/11	
Diethyl phthalate	ND	ug/L	0.50	1.0					04/18/11 :04/20/11	
Dimethyl phthalate	ND	ug/L	0.50	1.0					04/18/11 :04/20/11	
Di-n-octyl phthalate	ND	ug/L	0.50	1.0					04/18/11 :04/20/11	
Bis(2-ethylhexyl) phthalate	ND	ug/L	0.50	1.0					04/18/11 :04/20/11	

Surrogate

2-Methylnaphthalene-d10	0.21			ug/L	0.216	97	04/18/11 :04/20/11
Fluoranthene-d10	0.26			ug/L	0.216	121	04/18/11 :04/20/11

LCS (B11D281-BS1)

Acenaphthene	0.102	ug/L	0.020	0.020	0.108	95 (39-136)	04/18/11 :04/20/11
Acenaphthylene	0.115	ug/L	0.020	0.020	0.108	106 (48-134)	04/18/11 :04/20/11
Anthracene	0.122	ug/L	0.020	0.020	0.108	113 (55-133)	04/18/11 :04/20/11
Benzo(a)anthracene	0.0978	ug/L	0.010	0.010	0.108	90 (53-140)	04/18/11 :04/20/11
Benzo(a)pyrene	0.0843	ug/L	0.010	0.010	0.108	78 (42-135)	04/18/11 :04/20/11
Benzo(b)fluoranthene	0.0865	ug/L	0.010	0.010	0.108	80 (46-137)	04/18/11 :04/20/11
Benzo(g,h,i)perylene	0.0957	ug/L	0.010	0.010	0.108	88 (32-142)	04/18/11 :04/20/11
Benzo(k)fluoranthene	0.0805	ug/L	0.010	0.010	0.108	74 (46-128)	04/18/11 :04/20/11
Chrysene	0.0941	ug/L	0.010	0.010	0.108	87 (64-142)	04/18/11 :04/20/11
Dibenzo(a,h)anthracene	0.102	ug/L	0.010	0.010	0.108	95 (32-144)	04/18/11 :04/20/11
Fluoranthene	0.117	ug/L	0.010	0.010	0.108	108 (57-142)	04/18/11 :04/20/11
Fluorene	0.112	ug/L	0.020	0.020	0.108	104 (50-135)	04/18/11 :04/20/11

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11D281										
LCS (B11D281-BS1)										
Indeno(1,2,3-cd)pyrene	0.0978	ug/L	0.010	0.010	0.108		90 (33-143)		04/18/11 :04/20/11	
1-Methylnaphthalene	0.105	ug/L	0.020	0.020	0.108		98 (50-150)		04/18/11 :04/20/11	
2-Methylnaphthalene	0.105	ug/L	0.020	0.020	0.108		97 (50-150)		04/18/11 :04/20/11	
Naphthalene	0.103	ug/L	0.040	0.040	0.108		95 (46-157)		04/18/11 :04/20/11	
Phenanthrene	0.113	ug/L	0.020	0.020	0.108		104 (57-137)		04/18/11 :04/20/11	
Pyrene	0.106	ug/L	0.010	0.010	0.108		98 (59-136)		04/18/11 :04/20/11	
Butyl benzyl phthalate	1.13	ug/L	0.50	1.0	1.08		105 (66-152)		04/18/11 :04/20/11	
Di-n-butyl phthalate	1.14	ug/L	0.50	1.0	1.08		106 (73-157)		04/18/11 :04/20/11	
Diethyl phthalate	1.39	ug/L	0.50	1.0	1.08		129 (62-166)		04/18/11 :04/20/11	
Dimethyl phthalate	1.37	ug/L	0.50	1.0	1.08		126 (60-157)		04/18/11 :04/20/11	
Di-n-octyl phthalate	1.03	ug/L	0.50	1.0	1.08		95 (27-173)		04/18/11 :04/20/11	
Bis(2-ethylhexyl) phthalate	1.12	ug/L	0.50	1.0	1.08		104 (29-185)		04/18/11 :04/20/11	
Surrogate										
2-Methylnaphthalene-d10	0.22			ug/L	0.216		99 (44-131)		04/18/11 :04/20/11	
Fluoranthene-d10	0.25			ug/L	0.216		116 (54-150)		04/18/11 :04/20/11	
LCS Dup (B11D281-BSD1)										
Acenaphthene	0.0968	ug/L	0.020	0.020	0.108		90 (39-136)	5 (20)	04/18/11 :04/20/11	
Acenaphthylene	0.109	ug/L	0.020	0.020	0.108		100 (48-134)	6 (20)	04/18/11 :04/20/11	
Anthracene	0.119	ug/L	0.020	0.020	0.108		110 (55-133)	2 (20)	04/18/11 :04/20/11	
Benzo(a)anthracene	0.0941	ug/L	0.010	0.010	0.108		87 (53-140)	4 (20)	04/18/11 :04/20/11	
Benzo(a)pyrene	0.0805	ug/L	0.010	0.010	0.108		74 (42-135)	5 (20)	04/18/11 :04/20/11	
Benzo(b)fluoranthene	0.0832	ug/L	0.010	0.010	0.108		77 (46-137)	4 (20)	04/18/11 :04/20/11	
Benzo(g,h,i)perylene	0.0903	ug/L	0.010	0.010	0.108		84 (32-142)	6 (20)	04/18/11 :04/20/11	
Benzo(k)fluoranthene	0.0773	ug/L	0.010	0.010	0.108		72 (46-128)	4 (20)	04/18/11 :04/20/11	
Chrysene	0.0897	ug/L	0.010	0.010	0.108		83 (64-142)	5 (20)	04/18/11 :04/20/11	
Dibenzo(a,h)anthracene	0.0973	ug/L	0.010	0.010	0.108		90 (32-144)	5 (20)	04/18/11 :04/20/11	
Fluoranthene	0.117	ug/L	0.010	0.010	0.108		108 (57-142)	0 (20)	04/18/11 :04/20/11	
Fluorene	0.108	ug/L	0.020	0.020	0.108		100 (50-135)	4 (20)	04/18/11 :04/20/11	
Indeno(1,2,3-cd)pyrene	0.0930	ug/L	0.010	0.010	0.108		86 (33-143)	5 (20)	04/18/11 :04/20/11	
1-Methylnaphthalene	0.0973	ug/L	0.020	0.020	0.108		90 (50-150)	8 (20)	04/18/11 :04/20/11	
2-Methylnaphthalene	0.0968	ug/L	0.020	0.020	0.108		90 (50-150)	8 (20)	04/18/11 :04/20/11	
Naphthalene	0.0962	ug/L	0.040	0.040	0.108		89 (46-157)	7 (20)	04/18/11 :04/20/11	
Phenanthrene	0.111	ug/L	0.020	0.020	0.108		103 (57-137)	1 (20)	04/18/11 :04/20/11	
Pyrene	0.106	ug/L	0.010	0.010	0.108		99 (59-136)	0.5 (20)	04/18/11 :04/20/11	
Butyl benzyl phthalate	1.10	ug/L	0.50	1.0	1.08		102 (66-152)	3 (20)	04/18/11 :04/20/11	
Di-n-butyl phthalate	1.13	ug/L	0.50	1.0	1.08		104 (73-157)	1 (20)	04/18/11 :04/20/11	
Diethyl phthalate	1.36	ug/L	0.50	1.0	1.08		126 (62-166)	2 (20)	04/18/11 :04/20/11	
Dimethyl phthalate	1.34	ug/L	0.50	1.0	1.08		124 (60-157)	2 (20)	04/18/11 :04/20/11	
Di-n-octyl phthalate	0.957	ug/L	0.50	1.0	1.08		89 (27-173)	7 (20)	04/18/11 :04/20/11	
Bis(2-ethylhexyl) phthalate	1.04	ug/L	0.50	1.0	1.08		96 (29-185)	8 (20)	04/18/11 :04/20/11	
Surrogate										

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11D281

LCS Dup (B11D281-BSD1)

Surrogate

2-Methylnaphthalene-d10	0.21			ug/L	0.216		96 (44-131)		04/18/11 :04/20/11	
Fluoranthene-d10	0.24			ug/L	0.216		113 (54-150)		04/18/11 :04/20/11	

Matrix Spike (B11D281-MS1)

Source: W11D167-01

Acenaphthene	0.254	ug/L	0.020	0.020	0.270	ND	94 (39-136)		04/18/11 :04/20/11	
Acenaphthylene	0.274	ug/L	0.020	0.020	0.270	ND	101 (48-134)		04/18/11 :04/20/11	
Anthracene	0.325	ug/L	0.020	0.020	0.270	ND	120 (55-133)		04/18/11 :04/20/11	
Benzo(a)anthracene	0.317	ug/L	0.010	0.010	0.270	ND	117 (53-140)		04/18/11 :04/20/11	
Benzo(a)pyrene	0.292	ug/L	0.010	0.010	0.270	ND	108 (42-135)		04/18/11 :04/20/11	
Benzo(b)fluoranthene	0.301	ug/L	0.010	0.010	0.270	0.0173	105 (46-137)		04/18/11 :04/20/11	
Benzo(g,h,i)perylene	0.353	ug/L	0.010	0.010	0.270	0.0173	124 (32-142)		04/18/11 :04/20/11	
Benzo(k)fluoranthene	0.283	ug/L	0.010	0.010	0.270	ND	105 (46-128)		04/18/11 :04/20/11	
Chrysene	0.316	ug/L	0.010	0.010	0.270	0.0135	112 (32-142)		04/18/11 :04/20/11	
Dibenzo(a,h)anthracene	0.359	ug/L	0.010	0.010	0.270	ND	133 (32-144)		04/18/11 :04/20/11	
Fluoranthene	0.337	ug/L	0.010	0.010	0.270	0.0395	110 (57-142)		04/18/11 :04/20/11	
Fluorene	0.286	ug/L	0.020	0.020	0.270	ND	106 (50-135)		04/18/11 :04/20/11	
Indeno(1,2,3-cd)pyrene	0.351	ug/L	0.010	0.010	0.270	ND	130 (33-143)		04/18/11 :04/20/11	
1-Methylnaphthalene	0.252	ug/L	0.020	0.020	0.270	ND	93 (50-150)		04/18/11 :04/20/11	
2-Methylnaphthalene	0.253	ug/L	0.020	0.020	0.270	ND	94 (50-150)		04/18/11 :04/20/11	
Naphthalene	0.239	ug/L	0.040	0.040	0.270	ND	88 (46-157)		04/18/11 :04/20/11	
Phenanthrene	0.312	ug/L	0.020	0.020	0.270	0.0292	105 (57-137)		04/18/11 :04/20/11	
Pyrene	0.316	ug/L	0.010	0.010	0.270	0.0346	104 (59-136)		04/18/11 :04/20/11	
Butyl benzyl phthalate	3.46	ug/L	0.50	1.0	2.70	ND	128 (66-152)		04/18/11 :04/20/11	
Di-n-butyl phthalate	3.46	ug/L	0.50	1.0	2.70	ND	128 (73-157)		04/18/11 :04/20/11	
Diethyl phthalate	3.57	ug/L	0.50	1.0	2.70	ND	132 (62-166)		04/18/11 :04/20/11	
Dimethyl phthalate	3.52	ug/L	0.50	1.0	2.70	ND	130 (60-157)		04/18/11 :04/20/11	
Di-n-octyl phthalate	3.80	ug/L	0.50	1.0	2.70	ND	141 (27-173)		04/18/11 :04/20/11	
Bis(2-ethylhexyl) phthalate	5.63	ug/L	0.50	1.0	2.70	2.44	118 (29-185)		04/18/11 :04/20/11	

Surrogate

2-Methylnaphthalene-d10	0.20			ug/L	0.216		91 (44-131)		04/18/11 :04/20/11	
Fluoranthene-d10	0.22			ug/L	0.216		104 (54-150)		04/18/11 :04/20/11	

Matrix Spike Dup (B11D281-MSD1)

Source: W11D167-01

Acenaphthene	0.291	ug/L	0.020	0.020	0.270	ND	108 (39-136)	14 (50)	04/18/11 :04/20/11	
Acenaphthylene	0.311	ug/L	0.020	0.020	0.270	ND	115 (48-134)	13 (50)	04/18/11 :04/20/11	
Anthracene	0.355	ug/L	0.020	0.020	0.270	ND	131 (55-133)	9 (50)	04/18/11 :04/20/11	
Benzo(a)anthracene	0.342	ug/L	0.010	0.010	0.270	ND	127 (53-140)	8 (50)	04/18/11 :04/20/11	
Benzo(a)pyrene	0.317	ug/L	0.010	0.010	0.270	ND	117 (42-135)	8 (50)	04/18/11 :04/20/11	
Benzo(b)fluoranthene	0.331	ug/L	0.010	0.010	0.270	0.0173	116 (46-137)	10 (50)	04/18/11 :04/20/11	
Benzo(g,h,i)perylene	0.382	ug/L	0.010	0.010	0.270	0.0173	135 (32-142)	8 (50)	04/18/11 :04/20/11	
Benzo(k)fluoranthene	0.301	ug/L	0.010	0.010	0.270	ND	111 (46-128)	6 (50)	04/18/11 :04/20/11	

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11D281										
Matrix Spike Dup (B11D281-MSD1)			Source: W11D167-01							
Chrysene	0.343	ug/L	0.010	0.010	0.270	0.0135	122 (32-142)	8 (50)	04/18/11 :04/20/11	
Dibenzo(a,h)anthracene	0.383	ug/L	0.010	0.010	0.270	ND	142 (32-144)	6 (50)	04/18/11 :04/20/11	
Fluoranthene	0.368	ug/L	0.010	0.010	0.270	0.0395	122 (57-142)	9 (50)	04/18/11 :04/20/11	
Fluorene	0.319	ug/L	0.020	0.020	0.270	ND	118 (50-135)	11 (50)	04/18/11 :04/20/11	
Indeno(1,2,3-cd)pyrene	0.379	ug/L	0.010	0.010	0.270	ND	140 (33-143)	8 (50)	04/18/11 :04/20/11	
1-Methylnaphthalene	0.292	ug/L	0.020	0.020	0.270	ND	108 (50-150)	15 (50)	04/18/11 :04/20/11	
2-Methylnaphthalene	0.292	ug/L	0.020	0.020	0.270	ND	108 (50-150)	14 (50)	04/18/11 :04/20/11	
Naphthalene	0.263	ug/L	0.040	0.040	0.270	ND	97 (46-157)	9 (50)	04/18/11 :04/20/11	
Phenanthrene	0.337	ug/L	0.020	0.020	0.270	0.0292	114 (57-137)	8 (50)	04/18/11 :04/20/11	
Pyrene	0.344	ug/L	0.010	0.010	0.270	0.0346	114 (59-136)	9 (50)	04/18/11 :04/20/11	
Butyl benzyl phthalate	3.81	ug/L	0.50	1.0	2.70	ND	141 (66-152)	10 (50)	04/18/11 :04/20/11	
Di-n-butyl phthalate	3.76	ug/L	0.50	1.0	2.70	ND	139 (73-157)	9 (50)	04/18/11 :04/20/11	
Diethyl phthalate	3.83	ug/L	0.50	1.0	2.70	ND	142 (62-166)	7 (50)	04/18/11 :04/20/11	
Dimethyl phthalate	3.78	ug/L	0.50	1.0	2.70	ND	140 (60-157)	7 (50)	04/18/11 :04/20/11	
Di-n-octyl phthalate	4.10	ug/L	0.50	1.0	2.70	ND	152 (27-173)	7 (50)	04/18/11 :04/20/11	
Bis(2-ethylhexyl) phthalate	6.24	ug/L	0.50	1.0	2.70	2.44	141 (29-185)	10 (50)	04/18/11 :04/20/11	
Surrogate										
2-Methylnaphthalene-d10	0.21			ug/L	0.216		99 (44-131)		04/18/11 :04/20/11	
Fluoranthene-d10	0.26			ug/L	0.216		120 (54-150)		04/18/11 :04/20/11	

Reported: 05/02/11 14:45

Renee Chauvin, Laboratory Coordinator QA/QC

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D150**

Client: Director's Office
Project Mgr: Linda Scheffler

Polychlorinated Biphenyls (PCBs) - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
PCB Aroclors by GC-ECD - Batch B11D313										
Blank (B11D313-BLK1)										
Aroclor 1016/1242	ND	ug/L		0.0250					04/20/11 :04/20/11	
Aroclor 1221	ND	ug/L		0.0500					04/20/11 :04/20/11	
Aroclor 1232	ND	ug/L		0.0250					04/20/11 :04/20/11	
Aroclor 1248	ND	ug/L		0.0250					04/20/11 :04/20/11	
Aroclor 1254	ND	ug/L		0.0250					04/20/11 :04/20/11	
Aroclor 1260	ND	ug/L		0.0250					04/20/11 :04/20/11	
Aroclor 1262	ND	ug/L		0.0250					04/20/11 :04/20/11	
Aroclor 1268	ND	ug/L		0.0250					04/20/11 :04/20/11	
Surrogate										
Tetrachloro-m-xylene	0.0380			ug/L	0.0500		76		04/20/11 :04/20/11	
Decachlorobiphenyl	0.0563			ug/L	0.0500		113		04/20/11 :04/20/11	
LCS (B11D313-BS1)										
Aroclor 1016/1242	0.1041	ug/L		0.0250	0.125		83 (64-122)		04/20/11 :04/20/11	
Aroclor 1260	0.08636	ug/L		0.0250	0.125		69 (66-122)		04/20/11 :04/20/11	
Surrogate										
Tetrachloro-m-xylene	0.0381			ug/L	0.0500		76 (41-107.6)		04/20/11 :04/20/11	
Decachlorobiphenyl	0.0538			ug/L	0.0500		108 (8.3-153)		04/20/11 :04/20/11	
LCS Dup (B11D313-BSD1)										
Aroclor 1016/1242	0.09872	ug/L		0.0250	0.125		79 (64-122)	5 (20)	04/20/11 :04/20/11	
Aroclor 1260	0.09431	ug/L		0.0250	0.125		75 (66-122)	9 (20)	04/20/11 :04/20/11	
Surrogate										
Tetrachloro-m-xylene	0.0355			ug/L	0.0500		71 (41-107.6)		04/20/11 :04/20/11	
Decachlorobiphenyl	0.0591			ug/L	0.0500		118 (8.3-153)		04/20/11 :04/20/11	

Qualifiers

D2 The sample required dilution due to high levels of target analytes.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference

Reported: 05/02/11 14:45

The results in this report apply only to the samples analyzed. Qualifiers and case narrative comments are essential to interpretation of the analytical results. Report reproductions and/or data summaries without qualifiers and comments are incomplete.

Renee Chauvin, Laboratory Coordinator QA/QC



Client Name: Director's Office
Project Name: Portland Harbor
Matrix: Stormwater

Date: 4/14/11
Work Order #: W11D150
Collected By: MJS, JJM

Requested Analyses

Lab Number	Special Instructions:		Sample Date		Sample Time	Sample Type	Requested Analyses					# of Containers	Remarks
	Location ID						TSS	TOC	Totals Metals (Cu, Zn)	PAH + Phthalates	PCB Aroclors (Low-level)		
01	S1_SW1		4/14/11	0920	G		•	•	•	•	•		AAM131 Downstream of manhole
02	S1_SW3			0907	G		•	•	•	•	•		AAM133 Downstream of manhole
03	S1_SW4			0859	G		•	•	•	•	•		AAM133 Upstream 15" lateral
04	S1_SW5			0829	G		•	•	•	•	•		AAM127 Upstream 21" main
05	S1_SW6			0846	G		•	•	•	•	•		AAM138 Upstream in lateral from SW
06	FIELDUP				G		•	•	•	•	•		Field Duplicate

Inquired By: Signature: <i>Matthew Sullivan</i> Printed Name: Matthew Sullivan	Date: 4/14/11 Time: 0955	Relinquished By: Signature: <i>MacKenzie Jick</i> Printed Name: MacKenzie Jick	Date: 4/14/11 Time: 0955	Received By: Signature: <i>MacKenzie Jick</i> Printed Name: MacKenzie Jick	Date: 4/14/11 Time: 0955
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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Tel: (503) 906-9200


TestAmerica Job ID: PUD0486

Client Project/Site: W11D150
Client Project Description: Portland Harbor

For:

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

Attn: Renee Chauvin



Authorized for release by:
05/02/2011 01:03:12 PM

Darrell Auvil
Project Manager
darrell.auvil@testamericainc.com

LINKS

Review your project
results through

TotalAccess

Have a Question?



Visit us at:

www.testamericainc.com

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all 2003 NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Sample Summary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11D150

TestAmerica Job ID: PUD0486

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
PUD0486-01	W11D150-01 (S1_SW1)	Stormwater	04/14/11 09:20	04/14/11 16:30
PUD0486-02	W11D150-02 (S1_SW3)	Stormwater	04/14/11 09:07	04/14/11 16:30
PUD0486-03	W11D150-03 (S1_SW4)	Stormwater	04/14/11 08:59	04/14/11 16:30
PUD0486-04	W11D150-04 (S1_SW5)	Stormwater	04/14/11 08:29	04/14/11 16:30
PUD0486-05	W11D150-05 (S1_SW6)	Stormwater	04/14/11 08:46	04/14/11 16:30
PUD0486-06	W11D150-06 (Field Duplicate)	Stormwater	04/14/11 00:00	04/14/11 16:30

- 1
- 2
- 3
- 4
- 5
- 6

Qualifier Definition/Glossary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11D150

TestAmerica Job ID: PUD0486

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.
EPA	United States Environmental Protection Agency
ND	Not Detected above the reporting level.
MDL	Method Detection Limit
RL	Reporting Limit
RE, RE1 (etc.)	Indicates a Re-extraction or Reanalysis of the sample.
%R	Percent Recovery
RPD	Relative Percent Difference, a measure of the relative difference between two points.

1

2

3

4

5

6

Analytical Data

Client: City of Portland Water Pollution Laboratory
Project/Site: W11D150

TestAmerica Job ID: PUD0486

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Client Sample ID: W11D150-01 (S1_SW1)

Date Collected: 04/14/11 09:20

Date Received: 04/14/11 16:30

Lab Sample ID: PUD0486-01

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	2.46		1.00		mg/l		04/20/11 08:45	04/21/11 13:50	1.00

Client Sample ID: W11D150-02 (S1_SW3)

Date Collected: 04/14/11 09:07

Date Received: 04/14/11 16:30

Lab Sample ID: PUD0486-02

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	2.87		1.00		mg/l		04/20/11 08:45	04/21/11 13:50	1.00

Client Sample ID: W11D150-03 (S1_SW4)

Date Collected: 04/14/11 08:59

Date Received: 04/14/11 16:30

Lab Sample ID: PUD0486-03

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3.18		1.00		mg/l		04/20/11 08:45	04/21/11 13:50	1.00

Client Sample ID: W11D150-04 (S1_SW5)

Date Collected: 04/14/11 08:29

Date Received: 04/14/11 16:30

Lab Sample ID: PUD0486-04

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.37		1.00		mg/l		04/20/11 08:45	04/21/11 13:50	1.00

Client Sample ID: W11D150-05 (S1_SW6)

Date Collected: 04/14/11 08:46

Date Received: 04/14/11 16:30

Lab Sample ID: PUD0486-05

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3.44		1.00		mg/l		04/20/11 08:45	04/21/11 13:50	1.00

Client Sample ID: W11D150-06 (Field Duplicate)

Date Collected: 04/14/11 00:00

Date Received: 04/14/11 16:30

Lab Sample ID: PUD0486-06

Matrix: Stormwater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3.05		1.00		mg/l		04/20/11 08:45	04/21/11 13:50	1.00

Quality Control Data

Client: City of Portland Water Pollution Laboratory
Project/Site: W11D150

TestAmerica Job ID: PUD0486

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Lab Sample ID: 11D0583-BLK1

Matrix: Water

Analysis Batch: 11D0583

Client Sample ID: 11D0583-BLK1

Prep Type: total

Prep Batch: 11D0583_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.00		mg/l		04/20/11 08:45	04/21/11 13:50	1.00

Lab Sample ID: 11D0583-BS1

Matrix: Water

Analysis Batch: 11D0583

Client Sample ID: 11D0583-BS1

Prep Type: total

Prep Batch: 11D0583_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	20.0	17.9		mg/l		89.4	85 - 115

Lab Sample ID: 11D0583-MS1

Matrix: Water

Analysis Batch: 11D0583

Client Sample ID: W11D150-01 (S1_SW1)

Prep Type: total

Prep Batch: 11D0583_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	2.46		25.0	27.8		mg/l		101	75 - 125

Lab Sample ID: 11D0583-DUP1

Matrix: Water

Analysis Batch: 11D0583

Client Sample ID: W11D150-01 (S1_SW1)

Prep Type: total

Prep Batch: 11D0583_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	Limit
Total Organic Carbon	2.46		2.28		mg/l		7.64	20

SUBCONTRACT ORDER
City of Portland Water Pollution Control Lab
W11D150

PUD0486

SENDING LABORATORY:

City of Portland Water Pollution Control Lab
6543 N. Burlington Ave
Portland, OR 97203
Phone: 503-823-5600
Fax: 503-823-5656
Invoice To: Charles Lytle using P.O.# 30001516

RECEIVING LABORATORY:

TestAmerica
9405 SW Nimbus Ave
Beaverton, OR 97008
Phone : (503) 906-9200
Fax: (503) 906-9210

WPCL Project Name

Portland Harbor

TURNAROUND REQUEST

☒

Standard

☐

Rush _ day(s)

Analysis	Due	Expires	Laboratory ID	Comments
<hr/>				
Sample ID: W11D150-01	Water	Sampled: 04/14/11 09:20		
Out-TOC Water	04/28/11 17:00	05/12/11 09:20		
Containers Supplied: G-amber 250ml H2SO4 (B)				
<hr/>				
Sample ID: W11D150-02	Water	Sampled: 04/14/11 09:07		
Out-TOC Water	04/28/11 17:00	05/12/11 09:07		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				
Sample ID: W11D150-03	Water	Sampled: 04/14/11 08:59		
Out-TOC Water	04/28/11 17:00	05/12/11 08:59		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				
Sample ID: W11D150-04	Water	Sampled: 04/14/11 08:29		
Out-TOC Water	04/28/11 17:00	05/12/11 08:29		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				
Sample ID: W11D150-05	Water	Sampled: 04/14/11 08:46		
Out-TOC Water	04/28/11 17:00	05/12/11 08:46		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				

Released By

Date

Received By

Date

Released By

Date

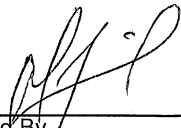
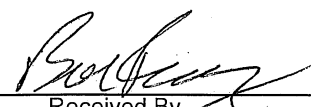
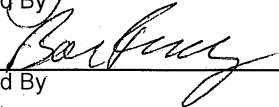
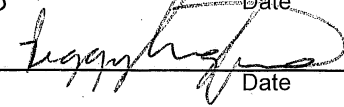
Received By

Date

SUBCONTRACT ORDER
City of Portland Water Pollution Control Lab
W11D150

PUD0486

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: W11D150-06	Water	Sampled: 04/14/11 00:00		
Out-TOC Water	04/28/11 17:00	05/12/11 00:00		
Containers Supplied:				
G amber 250ml H2SO4 (B				

Released By		Date	4/14/11	Received By		Date	4/14/11 @ 14:30
Released By		Date	4/14/11	Received By		Date	4/14/11 16:30

4.900

Portland Sample Control Checklist

Work Order #: PUD0486 Date/Time Received: 9/14/11 1430

Client Name: City of Portland

Project Name: W11D150

Time Zone:

☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☒ PDT/PST ☐ AK ☐ HI ☐ OTHER

Unpacking Checks:

Cooler (s): 1

Temperature (s): 4.9

Digi #1 ☐ Digi #2 ☐ IR Gun ☒ (☒ Plastic ☐ Glass)

Raytek ☐ (☐ Plastic ☐ Glass)

Ice used: (circle one) GEL LOOSE BLUE NONE OTHER: _____ Initials: PS

N/A Yes No

- ☒ ☐ ☐ 1. If ESI client, were temp blanks received? If no, document on NOD.
- ☒ ☐ ☐ 2. Cooler Seals intact? (N/A if hand delivered) if no and ESI client, document on NOD.
- ☐ ☒ ☐ 3. Chain of Custody present? If no, document on NOD. Along with "received by" & "relinquished by" signatures with date & time?
- ☒ ☐ ☐ 4. Bottles received intact? If no, document on NOD.
- ☒ ☐ ☐ 5. Sample is not multiphasic? If no, document on NOD.
- ☒ ☒ ☐ 6. Sampler name/signature documented on COC?
- ☒ ☐ ☐ 7. Proper Container and preservatives used? If no, document on NOD.
- ☒ ☐ ☐ 8. pH of all samples checked and meet requirements? If no, document on NOD.
- ☒ ☐ ☐ 9. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
- ☒ ☐ ☐ 10. HF Dilution required?
- ☒ ☐ ☐ 11. Sufficient volume provided for all analysis and requested MS/MSD? If no, document on NOD and consult PM before proceeding.
- ☒ ☐ ☐ 12. Did chain of custody agree with samples received? If no, document on NOD.
- ☒ ☐ ☐ 13. Were VOA samples received without headspace?
- ☐ ☒ ☐ 14. Did samples require preservation with sodium thiosulfate?
- ☒ ☐ ☐ 15. If yes to #14, was the residual chlorine test negative? If no, document on NOD.
- ☒ ☐ ☐ 16. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
- ☒ ☐ ☐ 17. Are analyses with short holding times received in hold?
- ☒ ☒ ☐ 18. Were special log-in instructions read and followed?

Checklist Reviewed: _____ Log-in initials: PS Labeler initials: PS

Event 4: April 28, 2011



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 Basin S-1 Stormwater Sampling Event 4

To: File
From: Andrew Davidson, GSI Water Solutions, Inc. (GSI)
Date: May 26, 2011

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated from a source control investigation sampling event conducted by the City of Portland (City) in Basin S-1 on April 28, 2011. Five stormwater field samples (W11D257-01 to W11D257-05) were collected and submitted for analyses.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontracted laboratory. The following laboratories conducted the analyses listed:

- BES WPCL
 - Total Suspended Solids – SM 2540D
 - Total Metals – EPA 200.8
 - Polycyclic Aromatic Hydrocarbons (PAHs) and Phthalates – EPA 8270M-SIM
 - Polychlorinated Biphenyls (PCBs) – EPA 8082
- Test America (TA)
 - Total Organic Carbon – SM 5310C

The WPCL laboratory report and the subcontracted laboratory report for all analyses associated with this sampling event are attached.

The following QA/QC review of the analytical data is based on the available documentation provided by WPCL and the subcontracted laboratories. The QA/QC review of the analytical data consisted of reviewing the following elements for each laboratory report, if applicable and/or available:

- Chain-of-custody – for completeness and continuous custody
- Analysis conducted within holding times

- Chemicals of interest detected in method blanks
- Surrogate and/or internal standard recoveries within laboratory control limits
- Matrix spike and matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control and duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits
- Relative percent differences (RPDs) for duplicate samples within laboratory control limits

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

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

Samples for all analyses were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the laboratory analyses of metals, PAHs/phthalates, PCB Aroclors, and TOC. No analytes were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries were completed during the laboratory analyses of PAHs/phthalates and PCB Aroclors. All surrogate recoveries were within laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

MS samples were processed during the laboratory analyses of total metals, PAHs/phthalates, and TOC. An MSD sample was processed during the laboratory analysis of PAHs/phthalates. All percent recoveries and RPDs were within laboratory control limits.

Laboratory Control Sample/Laboratory Control Sample Duplicate

LC samples were processed during the laboratory analyses of TSS, total metals, PAHs/phthalates, PCB Aroclors, and TOC. A DLC sample was processed during the laboratory analyses of PCB Aroclors. LC/DLC sample recoveries and RPDs were within laboratory control limits for all analyses.

Laboratory Duplicate Samples

Laboratory duplicate samples were processed during the laboratory analysis of TSS, total metals, and TOC. All RPDs for duplicate samples were within laboratory control limits.

Other

Several analytes were detected at values above the method detection limit but below the method reporting limit. These values are flagged as estimates “J”.



City of Portland
Water Pollution Control Laboratory

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



May 17, 2011

Linda Scheffler
Director's Office

Work Order
W11D257

Project
Portland Harbor

Received
04/28/11 17:44

Enclosed are the results of analysis for the above work order. If you have questions concerning this report, please contact your project coordinator Peter Abrams at 503-823-5533.

Renee Chauvin
Laboratory Coordinator QA/QC



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



LABORATORY ANALYSIS REPORT

Project: **Portland Harbor** Client: Director's Office
Work Order: **W11D257** Project Mgr: Linda Scheffler
Received: 4/28/11 17:44 WQDB #: Janus329
Submitted By: Field Operations

Sample	Laboratory ID	Matrix	Type	Sample Collection Date		Qualifier
				Start	End	
S1_SW1	W11D257-01	Stormwater	Grab	04/28/11 16:50	04/28/11 16:50	
S1_SW3	W11D257-02	Stormwater	Grab	04/28/11 16:37	04/28/11 16:37	
S1_SW4	W11D257-03	Stormwater	Grab	04/28/11 16:26	04/28/11 16:26	
S1_SW5	W11D257-04	Stormwater	Grab	04/28/11 15:53	04/28/11 15:53	
S1_SW6	W11D257-05	Stormwater	Grab	04/28/11 16:14	04/28/11 16:14	

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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General Chemistry

Total Suspended Solids

S1_SW1 : W11D257-01										
Total suspended solids	14	mg/L		2		B11D488	04/29/11	04/29/11	SM 2540D	
S1_SW3 : W11D257-02										
Total suspended solids	30	mg/L		2		B11D488	04/29/11	04/29/11	SM 2540D	
S1_SW4 : W11D257-03										
Total suspended solids	52	mg/L		2		B11D488	04/29/11	04/29/11	SM 2540D	
S1_SW5 : W11D257-04										
Total suspended solids	7	mg/L		2		B11D488	04/29/11	04/29/11	SM 2540D	
S1_SW6 : W11D257-05										
Total suspended solids	10	mg/L		2		B11D488	04/29/11	04/29/11	SM 2540D	

Reported: 05/17/11 08:22

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D257**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Total Metals

Total Metals by ICPMS

S1_SW1 : W11D257-01

Copper	23.1	ug/L		0.200	1	B11E062	05/04/11	05/07/11	EPA 200.8	
Zinc	311	ug/L		0.500	1	B11E062	05/04/11	05/07/11	EPA 200.8	

S1_SW3 : W11D257-02

Copper	22.3	ug/L		0.200	1	B11E062	05/04/11	05/07/11	EPA 200.8	
Zinc	241	ug/L		0.500	1	B11E062	05/04/11	05/07/11	EPA 200.8	

S1_SW4 : W11D257-03

Copper	27.7	ug/L		0.200	1	B11E062	05/04/11	05/07/11	EPA 200.8	
Zinc	467	ug/L		1.00	2	B11E062	05/04/11	05/07/11	EPA 200.8	

S1_SW5 : W11D257-04

Copper	22.3	ug/L		0.200	1	B11E062	05/04/11	05/07/11	EPA 200.8	
Zinc	275	ug/L		0.500	1	B11E062	05/04/11	05/07/11	EPA 200.8	

S1_SW6 : W11D257-05

Copper	15.9	ug/L		0.200	1	B11E062	05/04/11	05/07/11	EPA 200.8	
Zinc	89.7	ug/L		0.500	1	B11E062	05/04/11	05/07/11	EPA 200.8	

Reported: 05/17/11 08:22

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Project: **Portland Harbor**
Work Order: **W11D257**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW1 : W11D257-01

Acenaphthene	0.028	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Acenaphthylene	0.025	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Anthracene	0.081	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)anthracene	0.26	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)pyrene	0.28	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(b)fluoranthene	0.39	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(g,h,i)perylene	0.22	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(k)fluoranthene	0.14	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Chrysene	0.34	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Dibenzo(a,h)anthracene	0.072	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluoranthene	0.62	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluorene	0.029	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	0.19	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
1-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Naphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Phenanthrene	0.25	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Pyrene	0.59	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Dimethyl phthalate	0.80	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	J
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Bis(2-ethylhexyl) phthalate	1.3	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	

Surrogate

Result

Expected

%Rec

Limits(%)

2-Methylnaphthalene-d10	0.18	0.216	85%	44-131	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluoranthene-d10	0.23	0.216	108%	54-150	B11E010	05/02/11	05/04/11	EPA 8270-SIM	

S1_SW3 : W11D257-02

Acenaphthene	0.076	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Acenaphthylene	0.060	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Anthracene	0.25	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)anthracene	1.1	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)pyrene	1.3	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(b)fluoranthene	1.6	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(g,h,i)perylene	0.95	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(k)fluoranthene	0.72	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Chrysene	1.4	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Dibenzo(a,h)anthracene	0.33	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluoranthene	2.1	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluorene	0.058	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	

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Renee Chauvin, Laboratory Coordinator QA/QC



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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11D257**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW3 : W11D257-02

Indeno(1,2,3-cd)pyrene	0.89	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
1-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Naphthalene	0.041	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Phenanthrene	0.81	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Pyrene	2.3	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Dimethyl phthalate	2.0	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Di-n-octyl phthalate	0.53	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	J
Bis(2-ethylhexyl) phthalate	2.6	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.19	0.216	87%	44-131
Fluoranthene-d10	0.22	0.216	101%	54-150

S1_SW4 : W11D257-03

Acenaphthene	0.12	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Acenaphthylene	0.11	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Anthracene	0.44	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)anthracene	1.9	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)pyrene	2.2	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(b)fluoranthene	3.3	ug/L	0.030	0.030	3	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(g,h,i)perylene	1.3	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(k)fluoranthene	1.4	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Chrysene	2.6	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Dibenzo(a,h)anthracene	0.50	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluoranthene	4.0	ug/L	0.030	0.030	3	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluorene	0.095	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	1.3	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
1-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Naphthalene	0.056	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Phenanthrene	1.3	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Pyrene	4.3	ug/L	0.030	0.030	3	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Dimethyl phthalate	1.4	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Di-n-octyl phthalate	0.78	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	J
Bis(2-ethylhexyl) phthalate	3.2	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	

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Project: **Portland Harbor**
Work Order: **W11D257**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW4 : W11D257-03

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.20	0.216	91%	44-131
Fluoranthene-d10	0.22	0.216	102%	54-150

S1_SW5 : W11D257-04

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
Acenaphthene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Acenaphthylene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Anthracene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)anthracene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)pyrene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Chrysene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluoranthene	0.014	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Fluorene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
1-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Naphthalene	ND	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Phenanthrene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Pyrene	0.016	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Butyl benzyl phthalate	0.69	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	J
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Bis(2-ethylhexyl) phthalate	0.74	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	J

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.18	0.216	85%	44-131
Fluoranthene-d10	0.23	0.216	108%	54-150

S1_SW6 : W11D257-05

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
Acenaphthene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Acenaphthylene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Anthracene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)anthracene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(a)pyrene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(g,h,i)perylene	0.016	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM	

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Project: **Portland Harbor**
Work Order: **W11D257**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW6 : W11D257-05

Chrysene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Fluoranthene	0.018	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Fluorene	ND	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
1-Methylnaphthalene	0.047	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
2-Methylnaphthalene	0.058	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Naphthalene	0.042	ug/L	0.040	0.040	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Phenanthrene	0.022	ug/L	0.020	0.020	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Pyrene	0.028	ug/L	0.010	0.010	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Dimethyl phthalate	2.9	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	2.9	ug/L	0.50	1.0	1	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Surrogate	Result		Expected	%Rec	Limits(%)				
2-Methylnaphthalene-d10	0.21		0.216	96%	44-131	B11E010	05/02/11	05/04/11	EPA 8270-SIM
Fluoranthene-d10	0.21		0.216	97%	54-150	B11E010	05/02/11	05/04/11	EPA 8270-SIM

Reported: 05/17/11 08:22

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D257**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

S1_SW1 : W11D257-01

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)			
Tetrachloro-m-xylene	0.0327		0.0490	67%	41-107.6	B11E047	05/04/11	EPA 8082
Decachlorobiphenyl	0.0405		0.0490	83%	8.3-153	B11E047	05/04/11	EPA 8082

S1_SW3 : W11D257-02

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)			
Tetrachloro-m-xylene	0.0305		0.0488	63%	41-107.6	B11E047	05/04/11	EPA 8082
Decachlorobiphenyl	0.0501		0.0488	103%	8.3-153	B11E047	05/04/11	EPA 8082

S1_SW4 : W11D257-03

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Surrogate	Result		Expected	%Rec	Limits(%)			
Tetrachloro-m-xylene	0.0294		0.0493	60%	41-107.6	B11E047	05/04/11	EPA 8082
Decachlorobiphenyl	0.0655		0.0493	133%	8.3-153	B11E047	05/04/11	EPA 8082

S1_SW5 : W11D257-04

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082

Reported: 05/17/11 08:22

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11D257**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

S1_SW5 : W11D257-04

Aroclor 1248	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082

Surrogate	Result	Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0293	0.0493	60%	41-107.6	B11E047	05/04/11	05/04/11	EPA 8082
Decachlorobiphenyl	0.0366	0.0493	74%	8.3-153	B11E047	05/04/11	05/04/11	EPA 8082

S1_SW6 : W11D257-05

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1248	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1254	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1260	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1262	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082
Aroclor 1268	ND	ug/L	0.0250	1	B11E047	05/04/11	05/04/11	EPA 8082

Surrogate	Result	Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0301	0.0490	61%	41-107.6	B11E047	05/04/11	05/04/11	EPA 8082
Decachlorobiphenyl	0.0339	0.0490	69%	8.3-153	B11E047	05/04/11	05/04/11	EPA 8082

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Renee Chauvin, Laboratory Coordinator QA/QC



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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11D257**

Client: Director's Office
Project Mgr: Linda Scheffler

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Suspended Solids - Batch B11D488										
LCS (B11D488-BS1)										
Total suspended solids	98	mg/L			100		98 (90-110)		04/29/11 :04/29/11	
Duplicate (B11D488-DUP1) Source: W11D253-01										
Total suspended solids	84	mg/L		2		92	9 (20)		04/29/11 :04/29/11	
Duplicate (B11D488-DUP2) Source: W11D257-02										
Total suspended solids	30	mg/L		2		30	0 (20)		04/29/11 :04/29/11	

Total Metals - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Metals by ICPMS - Batch B11E062										
Blank (B11E062-BLK1)										
Copper	ND	ug/L		0.200					05/04/11 :05/07/11	
Zinc	ND	ug/L		0.500					05/04/11 :05/07/11	
LCS (B11E062-BS1)										
Copper	9.76	ug/L		0.200	10.0		98 (85-115)		05/04/11 :05/07/11	
Zinc	47.4	ug/L		0.500	50.0		95 (85-115)		05/04/11 :05/07/11	
Duplicate (B11E062-DUP1) Source: W11D257-01										
Copper	23.1	ug/L		0.200		23.1	0.2 (20)		05/04/11 :05/07/11	
Zinc	308	ug/L		0.500		311	0.9 (20)		05/04/11 :05/07/11	
Matrix Spike (B11E062-MS1) Source: W11D257-01										
Copper	32.6	ug/L		0.200	10.0	23.1	95 (70-130)		05/04/11 :05/07/11	
Zinc	355	ug/L		0.500	50.0	311	88 (70-130)		05/04/11 :05/07/11	

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Renee Chauvin, Laboratory Coordinator QA/QC

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Project: **Portland Harbor**
Work Order: **W11D257**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11E010

Blank (B11E010-BLK1)

Acenaphthene	ND	ug/L	0.020	0.020					05/02/11 :05/03/11	
Acenaphthylene	ND	ug/L	0.020	0.020					05/02/11 :05/03/11	
Anthracene	ND	ug/L	0.020	0.020					05/02/11 :05/03/11	
Benzo(a)anthracene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Benzo(a)pyrene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Chrysene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Fluoranthene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Fluorene	ND	ug/L	0.020	0.020					05/02/11 :05/03/11	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
1-Methylnaphthalene	ND	ug/L	0.040	0.040					05/02/11 :05/03/11	
2-Methylnaphthalene	ND	ug/L	0.040	0.040					05/02/11 :05/03/11	
Naphthalene	ND	ug/L	0.040	0.040					05/02/11 :05/03/11	
Phenanthrene	ND	ug/L	0.020	0.020					05/02/11 :05/03/11	
Pyrene	ND	ug/L	0.010	0.010					05/02/11 :05/03/11	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0					05/02/11 :05/03/11	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0					05/02/11 :05/03/11	
Diethyl phthalate	ND	ug/L	0.50	1.0					05/02/11 :05/03/11	
Dimethyl phthalate	ND	ug/L	0.50	1.0					05/02/11 :05/03/11	
Di-n-octyl phthalate	ND	ug/L	0.50	1.0					05/02/11 :05/03/11	
Bis(2-ethylhexyl) phthalate	ND	ug/L	0.50	1.0					05/02/11 :05/03/11	

Surrogate

2-Methylnaphthalene-d10	0.12			ug/L	0.216		57		05/02/11 :05/03/11	
Fluoranthene-d10	0.23			ug/L	0.216		104		05/02/11 :05/03/11	

LCS (B11E010-BS2)

Acenaphthene	0.0476	ug/L	0.020	0.020	0.0541		88 (39-136)		05/02/11 :05/04/11	
Acenaphthylene	0.0519	ug/L	0.020	0.020	0.0541		96 (48-134)		05/02/11 :05/04/11	
Anthracene	0.0600	ug/L	0.020	0.020	0.0541		111 (55-133)		05/02/11 :05/04/11	
Benzo(a)anthracene	0.0562	ug/L	0.010	0.010	0.0541		104 (53-140)		05/02/11 :05/04/11	
Benzo(a)pyrene	0.0519	ug/L	0.010	0.010	0.0541		96 (42-135)		05/02/11 :05/04/11	
Benzo(b)fluoranthene	0.0562	ug/L	0.010	0.010	0.0541		104 (46-137)		05/02/11 :05/04/11	
Benzo(g,h,i)perylene	0.0541	ug/L	0.010	0.010	0.0541		100 (32-142)		05/02/11 :05/04/11	
Benzo(k)fluoranthene	0.0530	ug/L	0.010	0.010	0.0541		98 (46-128)		05/02/11 :05/04/11	
Chrysene	0.0573	ug/L	0.010	0.010	0.0541		106 (64-142)		05/02/11 :05/04/11	
Dibenzo(a,h)anthracene	0.0568	ug/L	0.010	0.010	0.0541		105 (32-144)		05/02/11 :05/04/11	
Fluoranthene	0.0638	ug/L	0.010	0.010	0.0541		118 (57-142)		05/02/11 :05/04/11	
Fluorene	0.0535	ug/L	0.020	0.020	0.0541		99 (50-135)		05/02/11 :05/04/11	

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Project: **Portland Harbor**
Work Order: **W11D257**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11E010

LCS (B11E010-BS2)

Indeno(1,2,3-cd)pyrene	0.0562	ug/L	0.010	0.010	0.0541		104 (33-143)		05/02/11 :05/04/11	
1-Methylnaphthalene	0.0524	ug/L	0.040	0.040	0.0541		97 (50-150)		05/02/11 :05/04/11	
2-Methylnaphthalene	0.0546	ug/L	0.040	0.040	0.0541		101 (50-150)		05/02/11 :05/04/11	
Naphthalene	0.0562	ug/L	0.040	0.040	0.0541		104 (46-157)		05/02/11 :05/04/11	
Phenanthrene	0.0584	ug/L	0.020	0.020	0.0541		108 (57-137)		05/02/11 :05/04/11	
Pyrene	0.0573	ug/L	0.010	0.010	0.0541		106 (59-136)		05/02/11 :05/04/11	
Butyl benzyl phthalate	0.625	ug/L	0.25	0.50	0.541		116 (66-152)		05/02/11 :05/04/11	
Di-n-butyl phthalate	0.679	ug/L	0.25	0.50	0.541		126 (73-157)		05/02/11 :05/04/11	
Diethyl phthalate	0.679	ug/L	0.25	0.50	0.541		126 (62-166)		05/02/11 :05/04/11	
Dimethyl phthalate	0.655	ug/L	0.25	0.50	0.541		121 (60-157)		05/02/11 :05/04/11	
Di-n-octyl phthalate	0.613	ug/L	0.25	0.50	0.541		113 (27-173)		05/02/11 :05/04/11	
Bis(2-ethylhexyl) phthalate	0.689	ug/L	0.25	0.50	0.541		127 (29-185)		05/02/11 :05/04/11	

Surrogate

2-Methylnaphthalene-d10	0.23			ug/L	0.216		105 (44-131)		05/02/11 :05/04/11	
Fluoranthene-d10	0.28			ug/L	0.216		132 (54-150)		05/02/11 :05/04/11	

Matrix Spike (B11E010-MS1)

Source: W11D255-02

Acenaphthene	0.268	ug/L	0.020	0.020	0.270	ND	99 (39-136)		05/02/11 :05/04/11	
Acenaphthylene	0.287	ug/L	0.020	0.020	0.270	ND	106 (48-134)		05/02/11 :05/04/11	
Anthracene	0.314	ug/L	0.020	0.020	0.270	ND	116 (55-133)		05/02/11 :05/04/11	
Benzo(a)anthracene	0.302	ug/L	0.010	0.010	0.270	ND	112 (53-140)		05/02/11 :05/04/11	
Benzo(a)pyrene	0.275	ug/L	0.010	0.010	0.270	ND	102 (42-135)		05/02/11 :05/04/11	
Benzo(b)fluoranthene	0.281	ug/L	0.010	0.010	0.270	ND	104 (46-137)		05/02/11 :05/04/11	
Benzo(g,h,i)perylene	0.319	ug/L	0.010	0.010	0.270	ND	118 (32-142)		05/02/11 :05/04/11	
Benzo(k)fluoranthene	0.270	ug/L	0.010	0.010	0.270	ND	100 (46-128)		05/02/11 :05/04/11	
Chrysene	0.298	ug/L	0.010	0.010	0.270	ND	110 (32-142)		05/02/11 :05/04/11	
Dibenzo(a,h)anthracene	0.336	ug/L	0.010	0.010	0.270	ND	124 (32-144)		05/02/11 :05/04/11	
Fluoranthene	0.323	ug/L	0.010	0.010	0.270	ND	119 (57-142)		05/02/11 :05/04/11	
Fluorene	0.295	ug/L	0.020	0.020	0.270	ND	109 (50-135)		05/02/11 :05/04/11	
Indeno(1,2,3-cd)pyrene	0.326	ug/L	0.010	0.010	0.270	ND	121 (33-143)		05/02/11 :05/04/11	
Naphthalene	0.279	ug/L	0.040	0.040	0.270	ND	103 (46-157)		05/02/11 :05/04/11	
Phenanthrene	0.294	ug/L	0.020	0.020	0.270	ND	109 (57-137)		05/02/11 :05/04/11	
Pyrene	0.291	ug/L	0.010	0.010	0.270	ND	108 (59-136)		05/02/11 :05/04/11	
Butyl benzyl phthalate	3.31	ug/L	0.50	1.0	2.70	ND	122 (66-152)		05/02/11 :05/04/11	
Di-n-butyl phthalate	3.41	ug/L	0.50	1.0	2.70	ND	126 (73-157)		05/02/11 :05/04/11	
Diethyl phthalate	3.44	ug/L	0.50	1.0	2.70	ND	127 (62-166)		05/02/11 :05/04/11	
Dimethyl phthalate	3.58	ug/L	0.50	1.0	2.70	ND	132 (60-157)		05/02/11 :05/04/11	
Di-n-octyl phthalate	3.43	ug/L	0.50	1.0	2.70	ND	127 (27-173)		05/02/11 :05/04/11	
Bis(2-ethylhexyl) phthalate	3.67	ug/L	0.50	1.0	2.70	ND	136 (29-185)		05/02/11 :05/04/11	

Surrogate

2-Methylnaphthalene-d10	0.21			ug/L	0.216		97 (44-131)		05/02/11 :05/04/11	
Fluoranthene-d10	0.24			ug/L	0.216		112 (54-150)		05/02/11 :05/04/11	

Reported: 05/17/11 08:22

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D257**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11E010										
Matrix Spike Dup (B11E010-MSD1)			Source: W11D255-02							
Acenaphthene	0.269	ug/L	0.020	0.020	0.270	ND	99 (39-136)	0.4 (50)	05/02/11 :05/04/11	
Acenaphthylene	0.285	ug/L	0.020	0.020	0.270	ND	105 (48-134)	0.8 (50)	05/02/11 :05/04/11	
Anthracene	0.306	ug/L	0.020	0.020	0.270	ND	113 (55-133)	2 (50)	05/02/11 :05/04/11	
Benzo(a)anthracene	0.292	ug/L	0.010	0.010	0.270	ND	108 (53-140)	3 (50)	05/02/11 :05/04/11	
Benzo(a)pyrene	0.264	ug/L	0.010	0.010	0.270	ND	98 (42-135)	4 (50)	05/02/11 :05/04/11	
Benzo(b)fluoranthene	0.279	ug/L	0.010	0.010	0.270	ND	103 (46-137)	0.8 (50)	05/02/11 :05/04/11	
Benzo(g,h,i)perylene	0.308	ug/L	0.010	0.010	0.270	ND	114 (32-142)	3 (50)	05/02/11 :05/04/11	
Benzo(k)fluoranthene	0.265	ug/L	0.010	0.010	0.270	ND	98 (46-128)	2 (50)	05/02/11 :05/04/11	
Chrysene	0.286	ug/L	0.010	0.010	0.270	ND	106 (32-142)	4 (50)	05/02/11 :05/04/11	
Dibenzo(a,h)anthracene	0.322	ug/L	0.010	0.010	0.270	ND	119 (32-144)	4 (50)	05/02/11 :05/04/11	
Fluoranthene	0.314	ug/L	0.010	0.010	0.270	ND	116 (57-142)	3 (50)	05/02/11 :05/04/11	
Fluorene	0.290	ug/L	0.020	0.020	0.270	ND	107 (50-135)	2 (50)	05/02/11 :05/04/11	
Indeno(1,2,3-cd)pyrene	0.315	ug/L	0.010	0.010	0.270	ND	117 (33-143)	3 (50)	05/02/11 :05/04/11	
Naphthalene	0.290	ug/L	0.040	0.040	0.270	ND	107 (46-157)	4 (50)	05/02/11 :05/04/11	
Phenanthrene	0.288	ug/L	0.020	0.020	0.270	ND	107 (57-137)	2 (50)	05/02/11 :05/04/11	
Pyrene	0.280	ug/L	0.010	0.010	0.270	ND	104 (59-136)	4 (50)	05/02/11 :05/04/11	
Butyl benzyl phthalate	3.19	ug/L	0.50	1.0	2.70	ND	118 (66-152)	4 (50)	05/02/11 :05/04/11	
Di-n-butyl phthalate	3.34	ug/L	0.50	1.0	2.70	ND	124 (73-157)	2 (50)	05/02/11 :05/04/11	
Diethyl phthalate	3.30	ug/L	0.50	1.0	2.70	ND	122 (62-166)	4 (50)	05/02/11 :05/04/11	
Dimethyl phthalate	3.44	ug/L	0.50	1.0	2.70	ND	127 (60-157)	4 (50)	05/02/11 :05/04/11	
Di-n-octyl phthalate	3.28	ug/L	0.50	1.0	2.70	ND	122 (27-173)	4 (50)	05/02/11 :05/04/11	
Bis(2-ethylhexyl) phthalate	3.49	ug/L	0.50	1.0	2.70	ND	129 (29-185)	5 (50)	05/02/11 :05/04/11	
Surrogate										
2-Methylnaphthalene-d10	0.17			ug/L	0.216		78 (44-131)		05/02/11 :05/04/11	
Fluoranthene-d10	0.23			ug/L	0.216		104 (54-150)		05/02/11 :05/04/11	

Reported: 05/17/11 08:22

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11D257**

Client: Director's Office
Project Mgr: Linda Scheffler

Polychlorinated Biphenyls (PCBs) - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
PCB Aroclors by GC-ECD - Batch B11E047										
Blank (B11E047-BLK1)										
Aroclor 1016/1242	ND	ug/L		0.0250					05/04/11 :05/04/11	
Aroclor 1221	ND	ug/L		0.0500					05/04/11 :05/04/11	
Aroclor 1232	ND	ug/L		0.0250					05/04/11 :05/04/11	
Aroclor 1248	ND	ug/L		0.0250					05/04/11 :05/04/11	
Aroclor 1254	ND	ug/L		0.0250					05/04/11 :05/04/11	
Aroclor 1260	ND	ug/L		0.0250					05/04/11 :05/04/11	
Aroclor 1262	ND	ug/L		0.0250					05/04/11 :05/04/11	
Aroclor 1268	ND	ug/L		0.0250					05/04/11 :05/04/11	
Surrogate										
Tetrachloro-m-xylene	0.0313			ug/L	0.0500		63		05/04/11 :05/04/11	
Decachlorobiphenyl	0.0557			ug/L	0.0500		111		05/04/11 :05/04/11	
LCS (B11E047-BS1)										
Aroclor 1016/1242	0.09998	ug/L		0.0250	0.125		80 (64-122)		05/04/11 :05/04/11	
Aroclor 1260	0.1094	ug/L		0.0250	0.125		88 (66-122)		05/04/11 :05/04/11	
Surrogate										
Tetrachloro-m-xylene	0.0335			ug/L	0.0500		67 (41-107.6)		05/04/11 :05/04/11	
Decachlorobiphenyl	0.0498			ug/L	0.0500		100 (8.3-153)		05/04/11 :05/04/11	
LCS Dup (B11E047-BSD1)										
Aroclor 1016/1242	0.1014	ug/L		0.0250	0.125		81 (64-122)	1 (20)	05/04/11 :05/04/11	
Aroclor 1260	0.1159	ug/L		0.0250	0.125		93 (66-122)	6 (20)	05/04/11 :05/04/11	
Surrogate										
Tetrachloro-m-xylene	0.0319			ug/L	0.0500		64 (41-107.6)		05/04/11 :05/04/11	
Decachlorobiphenyl	0.0544			ug/L	0.0500		109 (8.3-153)		05/04/11 :05/04/11	

Qualifiers

J Analyte was detected but at a concentration below the reporting limit; the result is an estimate.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference

Reported: 05/17/11 08:22

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Renee Chauvin, Laboratory Coordinator QA/QC



City of Portland
Chain-of-Custody



Bureau of Environmental Services

Work Order #: W11D257

Collected By: MJS

Date: 4/28/11

Client Name: _____ Director's Office _____
Project Name: **Portland Harbor** Matrix: _____ Stormwater _____

Special Instructions:

Basin S-1 Stormwater (Revised 4/11/11)

¹Includes 1 & 2 Methylanthalene

Requested Analyses

Special Instructions:									
Basin S-1 Stormwater (Revised 4/11/11)									
Includes 1 & 2 Methylnaphthalene									
Lab Number									
Location ID	Sample Date	Sample Time	Sample Type	TSS	TOC	Totals Metals (Cu, Zn)	PAH + Phthalates ¹	PCB Aroclors (Low-level)	
01	S1_SW1	4/28/11	1650	G	•	•	•	•	•
02	S1_SW3		1637	G	•	•	•	•	•
03	S1_SW4		1626	G	•	•	•	•	•
04	S1_SW5		1553	G	•	•	•	•	•
05	S1_SW6		1614	G	•	•	•	•	•
M35 FIELD DUB					•	•	•	•	•

* Note: The samples were stored in sample receiving refrigerated overnight.

Relinquished By: Signature: <i>Mark Sullivan</i> Date: 4/28/11 Printed Name: Mark Sullivan Time: 1744	Received By: Signature: <i>Rona Klineh</i> Date: 4/29/11 Printed Name: Rona Klineh Time: 0810	Relinquished By: Signature: _____ Date: _____ Printed Name: _____ Time: _____	Received By: Signature: _____ Date: _____ Printed Name: _____ Time: _____
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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Tel: (503) 906-9200

TestAmerica Job ID: PUE0043

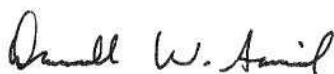
Client Project/Site: W11D257

Client Project Description: Portland Harbor

For:

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

Attn: Renee Chauvin



Authorized for release by:
05/16/2011 03:29:31 PM

Darrell Auvil
Project Manager
darrell.auvil@testamericainc.com

LINKS

Review your project
results through

TotalAccess

Have a Question?



Visit us at:

www.testamericainc.com

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all 2003 NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Sample Summary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11D257

TestAmerica Job ID: PUE0043

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
PUE0043-01	W11D257-01 (S1_SW1)	Stormwater	04/28/11 16:50	05/02/11 13:55
PUE0043-02	W11D257-02 (S1_SW3)	Stormwater	04/28/11 16:37	05/02/11 13:55
PUE0043-03	W11D257-03 (S1_SW4)	Stormwater	04/28/11 16:26	05/02/11 13:55
PUE0043-04	W11D257-04 (S1_SW5)	Stormwater	04/28/11 15:53	05/02/11 13:55
PUE0043-05	W11D257-05 (S1_SW6)	Stormwater	04/28/11 16:14	05/02/11 13:55

- 1
- 2
- 3
- 4
- 5
- 6

Qualifier Definition/Glossary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11D257

TestAmerica Job ID: PUE0043

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.
EPA	United States Environmental Protection Agency
ND	Not Detected above the reporting level.
MDL	Method Detection Limit
RL	Reporting Limit
RE, RE1 (etc.)	Indicates a Re-extraction or Reanalysis of the sample.
%R	Percent Recovery
RPD	Relative Percent Difference, a measure of the relative difference between two points.

1

2

3

4

5

6

Analytical Data

Client: City of Portland Water Pollution Laboratory
Project/Site: W11D257

TestAmerica Job ID: PUE0043

Client Sample ID: W11D257-01 (S1_SW1)

Date Collected: 04/28/11 16:50

Date Received: 05/02/11 13:55

Lab Sample ID: PUE0043-01

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3.58		1.00		mg/l		05/04/11 10:29	05/05/11 16:33	1.00

Client Sample ID: W11D257-02 (S1_SW3)

Date Collected: 04/28/11 16:37

Date Received: 05/02/11 13:55

Lab Sample ID: PUE0043-02

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	7.69		1.00		mg/l		05/04/11 10:29	05/05/11 16:33	1.00

Client Sample ID: W11D257-03 (S1_SW4)

Date Collected: 04/28/11 16:26

Date Received: 05/02/11 13:55

Lab Sample ID: PUE0043-03

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	7.57		1.00		mg/l		05/04/11 10:29	05/05/11 16:33	1.00

Client Sample ID: W11D257-04 (S1_SW5)

Date Collected: 04/28/11 15:53

Date Received: 05/02/11 13:55

Lab Sample ID: PUE0043-04

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.97		1.00		mg/l		05/04/11 10:30	05/05/11 16:33	1.00

Client Sample ID: W11D257-05 (S1_SW6)

Date Collected: 04/28/11 16:14

Date Received: 05/02/11 13:55

Lab Sample ID: PUE0043-05

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	11.0		1.00		mg/l		05/04/11 10:30	05/05/11 16:33	1.00

Quality Control Data

Client: City of Portland Water Pollution Laboratory
Project/Site: W11D257

TestAmerica Job ID: PUE0043

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Lab Sample ID: 11E0088-BLK1

Matrix: Water

Analysis Batch: 11E0088

Client Sample ID: 11E0088-BLK1

Prep Type: Total

Prep Batch: 11E0088_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.00		mg/l		05/04/11 10:29	05/05/11 16:33	1.00

Lab Sample ID: 11E0088-BS1

Matrix: Water

Analysis Batch: 11E0088

Client Sample ID: 11E0088-BS1

Prep Type: Total

Prep Batch: 11E0088_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	20.0	18.5		mg/l		92.5	85 - 115

Lab Sample ID: 11E0088-MS1

Matrix: Water

Analysis Batch: 11E0088

Client Sample ID: PUD1002-01

Prep Type: Total

Prep Batch: 11E0088_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	ND		25.0	25.2		mg/l		101	75 - 125

Lab Sample ID: 11E0088-DUP1

Matrix: Water

Analysis Batch: 11E0088

Client Sample ID: PUD1002-01

Prep Type: Total

Prep Batch: 11E0088_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	ND		ND		mg/l			20

Lab Sample ID: 11E0089-BLK1

Matrix: Water

Analysis Batch: 11E0089

Client Sample ID: 11E0089-BLK1

Prep Type: Total

Prep Batch: 11E0089_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.00		mg/l		05/04/11 10:30	05/05/11 16:33	1.00

Lab Sample ID: 11E0089-BS1

Matrix: Water

Analysis Batch: 11E0089

Client Sample ID: 11E0089-BS1

Prep Type: Total

Prep Batch: 11E0089_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	20.0	19.9		mg/l		99.4	85 - 115

Lab Sample ID: 11E0089-MS1

Matrix: Water

Analysis Batch: 11E0089

Client Sample ID: W11D257-04 (S1_SW5)

Prep Type: Total

Prep Batch: 11E0089_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	1.97		25.0	26.4		mg/l		97.9	75 - 125

Lab Sample ID: 11E0089-DUP1

Matrix: Water

Analysis Batch: 11E0089

Client Sample ID: W11D257-04 (S1_SW5)

Prep Type: Total

Prep Batch: 11E0089_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	1.97		2.08		mg/l		5.05	20

TestAmerica Portland

SUBCONTRACT ORDER
City of Portland Water Pollution Control Lab
W11D257

PUE0043

SENDING LABORATORY:

City of Portland Water Pollution Control Lab
6543 N. Burlington Ave
Portland, OR 97203
Phone: 503-823-5600
Fax: 503-823-5656
Invoice To: Charles Lytle using P.O.# 30001516

RECEIVING LABORATORY:

TestAmerica
9405 SW Nimbus Ave
Beaverton, OR 97008
Phone : (503) 906-9200
Fax: (503) 906-9210

WPCL Project Name

Portland Harbor

TURNAROUND REQUEST

☒ Standard

☒ Rush 10 day(s)

Standard

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: W11D257-01	Water	Sampled: 04/28/11 16:50		
Out-TOC Water	05/13/11 17:00	05/26/11 16:50		
Containers Supplied: G amber 250ml H2SO4 (B)				
Sample ID: W11D257-02	Water	Sampled: 04/28/11 16:37		
Out-TOC Water	05/13/11 17:00	05/26/11 16:37		
Containers Supplied: G amber 250ml H2SO4 (B)				
Sample ID: W11D257-03	Water	Sampled: 04/28/11 16:26		
Out-TOC Water	05/13/11 17:00	05/26/11 16:26		
Containers Supplied: G amber 250ml H2SO4 (B)				
Sample ID: W11D257-04	Water	Sampled: 04/28/11 15:53		
Out-TOC Water	05/13/11 17:00	05/26/11 15:53		
Containers Supplied: G amber 250ml H2SO4 (B)				
Sample ID: W11D257-05	Water	Sampled: 04/28/11 16:14		
Out-TOC Water	05/13/11 17:00	05/26/11 16:14		
Containers Supplied: G amber 250ml H2SO4 (B)				

Released By

Date

Received By

Date

Released By

Date

Received By

Date

Portland Sample Control Checklist

Work Order #: RE0043 Date/Time Received: 5-2-11 1355

Client Name: CITY OF PORTLAND

Project Name: W11D257

Time Zone:
☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☒ PDT/PST ☐ AK ☐ HI ☐ OTHER

Unpacking Checks:

Cooler (s): 1
 Temperature (s): 4.3 °C

Digi #1 ☐ Digi #2 ☐ IR Gun ☒ (☐ Plastic ☒ Glass)

Raytek
☐ (☐ Plastic ☐ Glass)

Ice used: (circle one) GEL LOOSE BLUE NONE OTHER: _____ Initials: X

N/A Yes No

- ☒ ☐ ☐ 1. If ESI client, were temp blanks received? If no, document on NOD.
- ☒ ☐ ☐ 2. Cooler Seals intact? (N/A if hand delivered) if no and ESI client, document on NOD.
- ☒ ☐ ☐ 3. Chain of Custody present? If no, document on NOD. Along with "received by" & "relinquished by" signatures with date & time?
- ☒ ☐ ☐ 4. Bottles received intact? If no, document on NOD.
- ☒ ☐ ☐ 5. Sample is not multiphasic? If no, document on NOD.
- ☐ ☒ ☐ 6. Sampler name/signature documented on COC?
- ☒ ☐ ☐ 7. Proper Container and preservatives used? If no, document on NOD.
- ☒ ☐ ☐ 8. pH of all samples checked and meet requirements? If no, document on NOD.
- ☒ ☐ ☐ 9. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
- ☒ ☐ ☐ 10. HF Dilution required?
- ☒ ☐ ☐ 11. Sufficient volume provided for all analysis and requested MS/MSD? If no, document on NOD and consult PM before proceeding.
- ☒ ☐ ☐ 12. Did chain of custody agree with samples received? If no, document on NOD.
- ☒ ☐ ☐ 13. Were VOA samples received without headspace?
- ☐ ☒ ☐ 14. Did samples require preservation with sodium thiosulfate?
- ☒ ☐ ☐ 15. If yes to #14, was the residual chlorine test negative? If no, document on NOD.
- ☒ ☐ ☐ 16. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
- ☒ ☐ ☐ 17. Are analyses with short holding times received in hold?
- ☐ ☒ ☐ 18. Were special log- in instructions read and followed?

Checklist Reviewed: _____ Log-in initials: Y Labeler initials: P

Temperature out of Range:

☐ Not enough or No Ice
☐ Ice Melted
☐ W/in 4 Hrs of collection
☐ Ice Not Needed
☐ Other: _____

Event 5: May 11, 2011



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 Basin S-1 Stormwater Sampling Event 5

To: File
From: Andrew Davidson, GSI Water Solutions, Inc. (GSI)
Date: June 1, 2011

This memorandum presents a quality assurance/quality control (QA/QC) review of the laboratory data generated from a source control investigation sampling event conducted by the City of Portland (City) in Basin S-1 on May 11, 2011. Five stormwater field samples (W11E103-01 to W11E103-05) and one field duplicate sample (W11E103-06) were collected and submitted for analyses.

The laboratory analyses for these source control program samples were completed by the City's Bureau of Environmental Services (BES) Water Pollution Control Laboratory (WPCL) and a subcontracted laboratory. The following laboratories conducted the analyses listed:

- BES WPCL
 - Total Suspended Solids – SM 2540D
 - Total Metals – EPA 200.8
 - Polycyclic Aromatic Hydrocarbons (PAHs) and Phthalates – EPA 8270M-SIM
 - Polychlorinated Biphenyls (PCBs) Aroclors – EPA 8082
- Test America (TA)
 - Total Organic Carbon – SM 5310C

The WPCL laboratory report and the subcontracted laboratory report for all analyses associated with this sampling event are attached.

The following QA/QC review of the analytical data is based on the available documentation provided by WPCL and the subcontracted laboratory. The QA/QC review of the analytical data consisted of reviewing the following elements for each laboratory report, if applicable and/or available:

- Chain-of-custody – for completeness and continuous custody

- Analysis conducted within holding times
- Chemicals of interest detected in method blanks
- Surrogate and/or internal standard recoveries within laboratory control limits
- Matrix spike and matrix spike duplicate (MS/MSD) sample results within laboratory control limits
- Laboratory control and duplicate laboratory control (LC/DLC) sample recoveries within laboratory control limits
- Relative percent differences (RPDs) for duplicate samples within laboratory control limits

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

Chain-of-Custody

The chain-of-custody forms showed continuous custody of the samples. The chain-of-custody procedures appear to have been adequate indicating that sample integrity was maintained throughout the sample collection and delivery process.

Analysis Holding Times

Samples for all analyses were extracted and analyzed within the recommended method-specific holding times.

Method Blanks

Method blanks were processed during the laboratory analyses of metals, PAHs/phthalates, PCB Aroclors, and TOC. No analytes were detected in the method blanks.

Surrogate Recoveries

Surrogate recoveries were completed during the laboratory analyses of PAHs/phthalates and PCB Aroclors. All surrogate recoveries were within laboratory control limits.

Matrix Spike/Matrix Spike Duplicates

MS samples were processed during the laboratory analyses of total metals, PAHs/phthalates, and TOC. MSD samples were processed during the laboratory analyses of total metals and PAHs/phthalates. All percent recoveries and RPDs were within laboratory control limits for MS/MSD samples processed during the metal analysis. During the PAH/phthalate analysis, MS/MSD recoveries for nine analytes were not applicable because the matrix source concentration was greater than four times the spike amount. However, corresponding LCS recoveries were within laboratory control limits, and the data are not qualified further. One analyte, benzo(k)fluoranthene, was recovered above laboratory-specified control limits in the MS/MSD sample. Accordingly, results for this analyte are qualified as estimates (“J”) when detected in the associated field samples.

Laboratory Control Sample/Laboratory Control Sample Duplicate

LC samples were processed during the laboratory analyses of TSS, total metals, PAHs/phthalates, PCB Aroclors, and TOC. A DLC sample was processed during the laboratory analysis of PCB Aroclors. LC/DLC sample recoveries and RPDs were within laboratory control limits for all analyses.

Laboratory Duplicate Samples

Laboratory duplicate samples were processed during the analyses of TSS, total metals, and TOC. All RPDs for duplicate samples were within laboratory control limits.

Other

A field duplicate was obtained as part of the QA/QC program. Field sample W11E103-03 and its duplicate sample W11E103-06 were obtained at the same location (SW4) in sequential time order. The analyte RPDs for the field and field duplicate sample were calculated and ranged from 1 to 23 percent. Two analytes, benzo(k)fluoranthene and naphthalene, had RPDs that exceeded 20 percent. Results for benzo(k)fluoranthene are flagged as estimates “J” due to matrix spike recoveries that exceeded laboratory control limits. Results for naphthalene are not qualified further as the reported values in the field sample and duplicate sample are low (near the MRL) and likely account for the higher RPD value.



City of Portland
Water Pollution Control Laboratory

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



May 31, 2011

Linda Scheffler
Director's Office

Work Order
W11E103

Project
Portland Harbor

Received
05/12/11 08:36

Enclosed are the results of analysis for the above work order. If you have questions concerning this report, please contact your project coordinator Peter Abrams at 503-823-5533.

Jennifer Shackelford
Production Coordinator



City of Portland
Water Pollution Control Laboratory

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LABORATORY ANALYSIS REPORT

Project: **Portland Harbor**
Work Order: **W11E103**
Received: 5/12/11 8:36
Submitted By: Matt Sullivan

Client: Director's Office
Project Mgr: Linda Scheffler
WQDB #: Janus329

Sample	Laboratory ID	Matrix	Type	Sample Collection Date		Qualifier
				Start	End	
S1_SW1	W11E103-01	Stormwater	Grab	05/11/11 18:26	05/11/11 18:26	
S1_SW3	W11E103-02	Stormwater	Grab	05/11/11 18:15	05/11/11 18:15	
S1_SW4	W11E103-03	Stormwater	Grab	05/11/11 18:02	05/11/11 18:02	
S1_SW5	W11E103-04	Stormwater	Grab	05/11/11 17:35	05/11/11 17:35	
S1_SW6	W11E103-05	Stormwater	Grab	05/11/11 17:50	05/11/11 17:50	
Field Duplicate	W11E103-06	Stormwater	Grab	05/11/11 00:00	05/11/11 00:00	

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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General Chemistry

Total Suspended Solids

S1_SW1 : W11E103-01										
Total suspended solids	7	mg/L		2		B11E205	05/12/11	05/12/11	SM 2540D	
S1_SW3 : W11E103-02										
Total suspended solids	29	mg/L		2		B11E205	05/12/11	05/12/11	SM 2540D	
S1_SW4 : W11E103-03										
Total suspended solids	53	mg/L		2		B11E205	05/12/11	05/12/11	SM 2540D	
S1_SW5 : W11E103-04										
Total suspended solids	13	mg/L		2		B11E205	05/12/11	05/12/11	SM 2540D	
S1_SW6 : W11E103-05										
Total suspended solids	4	mg/L		2		B11E205	05/12/11	05/12/11	SM 2540D	
Field Duplicate : W11E103-06										
Total suspended solids	56	mg/L		2		B11E205	05/12/11	05/12/11	SM 2540D	

Reported: 05/31/11 14:48

Jennifer Shackelford

Jennifer Shackelford, Production Coordinator

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City of Portland
Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Total Metals

Total Metals by ICPMS

S1_SW1 : W11E103-01

Copper	32.7	ug/L		0.200	1	B11E252	05/14/11	05/19/11	EPA 200.8	
Zinc	338	ug/L		0.500	1	B11E252	05/14/11	05/19/11	EPA 200.8	

S1_SW3 : W11E103-02

Copper	18.9	ug/L		0.200	1	B11E252	05/14/11	05/19/11	EPA 200.8	
Zinc	181	ug/L		0.500	1	B11E252	05/14/11	05/19/11	EPA 200.8	

S1_SW4 : W11E103-03

Copper	27.8	ug/L		0.200	1	B11E252	05/14/11	05/19/11	EPA 200.8	
Zinc	281	ug/L		0.500	1	B11E252	05/14/11	05/19/11	EPA 200.8	

S1_SW5 : W11E103-04

Copper	43.3	ug/L		0.200	1	B11E252	05/14/11	05/19/11	EPA 200.8	
Zinc	574	ug/L		2.50	5	B11E252	05/14/11	05/19/11	EPA 200.8	

S1_SW6 : W11E103-05

Copper	7.69	ug/L		0.200	1	B11E252	05/14/11	05/19/11	EPA 200.8	
Zinc	71.7	ug/L		0.500	1	B11E252	05/14/11	05/19/11	EPA 200.8	

Field Duplicate : W11E103-06

Copper	27.7	ug/L		0.200	1	B11E252	05/14/11	05/19/11	EPA 200.8	
Zinc	278	ug/L		0.500	1	B11E252	05/14/11	05/19/11	EPA 200.8	

Reported: 05/31/11 14:48

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Jennifer Shackelford

Jennifer Shackelford, Production Coordinator



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Project: **Portland Harbor**
Work Order: **W11E103**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW1 : W11E103-01

Acenaphthene	0.14	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Acenaphthylene	0.077	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Anthracene	0.38	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(a)anthracene	1.7	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(a)pyrene	2.0	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(b)fluoranthene	2.5	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(g,h,i)perylene	1.3	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(k)fluoranthene	0.88	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	M5
Chrysene	2.2	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Dibenzo(a,h)anthracene	0.46	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Fluoranthene	3.4	ug/L	0.050	0.050	5	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Fluorene	0.089	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Indeno(1,2,3-cd)pyrene	1.2	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
1-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
2-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Naphthalene	0.051	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Phenanthrene	1.3	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Pyrene	3.3	ug/L	0.050	0.050	5	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Bis(2-ethylhexyl) phthalate	1.0	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Surrogate	Result		Expected	%Rec	Limits(%)					
2-Methylnaphthalene-d10	0.15		0.216	68%	44-131	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Fluoranthene-d10	0.24		0.216	112%	54-150	B11E272	05/16/11	05/17/11	EPA 8270-SIM	

S1_SW3 : W11E103-02

Acenaphthene	0.46	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Acenaphthylene	0.23	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Anthracene	1.3	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(a)anthracene	5.1	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(a)pyrene	5.9	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(b)fluoranthene	7.1	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(g,h,i)perylene	3.7	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Benzo(k)fluoranthene	3.2	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM	M5
Chrysene	6.3	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Dibenzo(a,h)anthracene	1.4	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Fluoranthene	11	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM	
Fluorene	0.27	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM	

Reported: 05/31/11 14:48

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Jennifer Shackelford

Jennifer Shackelford, Production Coordinator



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11E103**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW3 : W11E103-02

Indeno(1,2,3-cd)pyrene	3.5	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
1-Methylnaphthalene	0.042	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
2-Methylnaphthalene	0.045	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Naphthalene	0.048	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Phenanthrene	3.8	ug/L	0.20	0.20	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Pyrene	10	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	1.4	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Surrogate	Result		Expected	%Rec	Limits(%)				
2-Methylnaphthalene-d10	0.16		0.216	73%	44-131	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluoranthene-d10	0.24		0.216	113%	54-150	B11E272	05/16/11	05/17/11	EPA 8270-SIM

S1_SW4 : W11E103-03

Acenaphthene	0.83	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Acenaphthylene	0.39	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Anthracene	2.3	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(a)anthracene	9.2	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(a)pyrene	10	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(b)fluoranthene	13	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(g,h,i)perylene	6.5	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(k)fluoranthene	4.6	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Chrysene	11	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	2.2	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluoranthene	18	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluorene	0.48	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	6.1	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
1-Methylnaphthalene	0.060	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
2-Methylnaphthalene	0.058	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Naphthalene	0.054	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Phenanthrene	6.7	ug/L	0.20	0.20	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Pyrene	18	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	1.7	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM

Reported: 05/31/11 14:48

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Jennifer Shackelford

Jennifer Shackelford, Production Coordinator



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW4 : W11E103-03

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.15	0.216	70%	44-131
Fluoranthene-d10	0.22	0.216	101%	54-150

S1_SW5 : W11E103-04

Acenaphthene	ND	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Acenaphthylene	ND	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Anthracene	ND	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(a)anthracene	0.010	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(a)pyrene	0.012	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(b)fluoranthene	0.017	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(g,h,i)perylene	0.016	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Chrysene	0.017	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluoranthene	0.037	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluorene	ND	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
1-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
2-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Naphthalene	ND	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Phenanthrene	0.037	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Pyrene	0.036	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	1.1	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM

M11

Surrogate	Result	Expected	%Rec	Limits(%)
2-Methylnaphthalene-d10	0.13	0.216	62%	44-131
Fluoranthene-d10	0.25	0.216	115%	54-150

S1_SW6 : W11E103-05

Acenaphthene	ND	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Acenaphthylene	ND	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Anthracene	ND	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(a)anthracene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(a)pyrene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM

M11

Reported: 05/31/11 14:48

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Jennifer Shackelford

Jennifer Shackelford, Production Coordinator



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

S1_SW6 : W11E103-05

Chrysene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluoranthene	0.021	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluorene	ND	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
1-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
2-Methylnaphthalene	ND	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Naphthalene	0.043	ug/L	0.040	0.040	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Phenanthrene	0.027	ug/L	0.020	0.020	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Pyrene	0.023	ug/L	0.010	0.010	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	1.3	ug/L	0.50	1.0	1	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Surrogate	Result		Expected	%Rec	Limits(%)				
2-Methylnaphthalene-d10	0.16		0.216	73%	44-131	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluoranthene-d10	0.26		0.216	120%	54-150	B11E272	05/16/11	05/17/11	EPA 8270-SIM

Field Duplicate : W11E103-06

Acenaphthene	0.85	ug/L	0.020	0.020	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Acenaphthylene	0.43	ug/L	0.020	0.020	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Anthracene	2.4	ug/L	0.020	0.020	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Benzo(a)anthracene	9.7	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(a)pyrene	11	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(b)fluoranthene	13	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(g,h,i)perylene	6.9	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Benzo(k)fluoranthene	5.7	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Chrysene	12	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Dibenzo(a,h)anthracene	2.2	ug/L	0.010	0.010	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Fluoranthene	19	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Fluorene	0.49	ug/L	0.020	0.020	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Indeno(1,2,3-cd)pyrene	6.6	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
1-Methylnaphthalene	0.061	ug/L	0.040	0.040	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
2-Methylnaphthalene	0.059	ug/L	0.040	0.040	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Naphthalene	0.068	ug/L	0.040	0.040	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Phenanthrene	7.0	ug/L	0.20	0.20	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Pyrene	19	ug/L	0.10	0.10	10	B11E272	05/16/11	05/17/11	EPA 8270-SIM
Butyl benzyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Di-n-butyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM

Reported: 05/31/11 14:48

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Jennifer Shackelford

Jennifer Shackelford, Production Coordinator



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Semivolatile Organics - SIM

Polynuclear Aromatics & Phthalates by GCMS-SIM

Field Duplicate : W11E103-06

Diethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Dimethyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Di-n-octyl phthalate	ND	ug/L	0.50	1.0	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM
Bis(2-ethylhexyl) phthalate	1.9	ug/L	0.50	1.0	1	B11E272	05/16/11	05/18/11	EPA 8270-SIM

Surrogate	Result	Expected	%Rec	Limits(%)					
2-Methylnaphthalene-d10	0.17	0.216	80%	44-131	B11E272	05/16/11	05/18/11	EPA 8270-SIM	
Fluoranthene-d10	0.24	0.216	111%	54-150	B11E272	05/16/11	05/18/11	EPA 8270-SIM	

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Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11E103**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

S1_SW1 : W11E103-01

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1221	ND	ug/L	0.0500	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1232	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1248	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1254	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1260	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1262	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1268	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0336		0.0488	69%	41-107.6	B11E320	05/19/11	05/23/11	EPA 8082
Decachlorobiphenyl	0.0462		0.0488	95%	8.3-153	B11E320	05/19/11	05/23/11	EPA 8082

S1_SW3 : W11E103-02

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1221	ND	ug/L	0.0500	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1232	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1248	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1254	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1260	0.0832	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1262	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1268	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0306		0.0495	62%	41-107.6	B11E320	05/19/11	05/23/11	EPA 8082
Decachlorobiphenyl	0.0361		0.0495	73%	8.3-153	B11E320	05/19/11	05/23/11	EPA 8082

S1_SW4 : W11E103-03

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1221	ND	ug/L	0.0500	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1232	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1248	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1254	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1260	0.134	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1262	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1268	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0352		0.0508	69%	41-107.6	B11E320	05/19/11	05/23/11	EPA 8082
Decachlorobiphenyl	0.0339		0.0508	67%	8.3-153	B11E320	05/19/11	05/23/11	EPA 8082

S1_SW5 : W11E103-04

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082
Aroclor 1221	ND	ug/L	0.0500	1	B11E320	05/19/11	05/23/11	EPA 8082
Aroclor 1232	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082

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Jennifer Shackelford, Production Coordinator



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11E103**

Client: **Director's Office**
Project Mgr: **Linda Scheffler**

Analyte	Result	Units	MDL	MRL	Dilution	Batch	Prepared	Analyzed	Method	Qualifier
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Polychlorinated Biphenyls (PCBs)

PCB Aroclors by GC-ECD

S1_SW5 : W11E103-04

Aroclor 1248	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1254	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1260	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1262	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1268	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0309		0.0490	63%	41-107.6	B11E320	05/19/11	05/23/11	EPA 8082
Decachlorobiphenyl	0.0334		0.0490	68%	8.3-153	B11E320	05/19/11	05/23/11	EPA 8082

S1_SW6 : W11E103-05

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1221	ND	ug/L	0.0500	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1232	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1248	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1254	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1260	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1262	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1268	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0311		0.0495	63%	41-107.6	B11E320	05/19/11	05/23/11	EPA 8082
Decachlorobiphenyl	0.0378		0.0495	76%	8.3-153	B11E320	05/19/11	05/23/11	EPA 8082

Field Duplicate : W11E103-06

Aroclor 1016/1242	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1221	ND	ug/L	0.0500	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1232	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1248	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1254	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1260	0.135	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1262	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Aroclor 1268	ND	ug/L	0.0250	1	B11E320	05/19/11	05/23/11	EPA 8082	
Surrogate	Result		Expected	%Rec	Limits(%)				
Tetrachloro-m-xylene	0.0329		0.0503	65%	41-107.6	B11E320	05/19/11	05/23/11	EPA 8082
Decachlorobiphenyl	0.0352		0.0503	70%	8.3-153	B11E320	05/19/11	05/23/11	EPA 8082

Reported: 05/31/11 14:48

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City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Quality Control Report

General Chemistry - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Suspended Solids - Batch B11E205										
LCS (B11E205-BS1)										
Total suspended solids	93	mg/L			100		93 (90-110)		05/12/11 :05/12/11	
Duplicate (B11E205-DUP1) Source: W11E103-02										
Total suspended solids	31	mg/L		2		29	7 (20)		05/12/11 :05/12/11	
Duplicate (B11E205-DUP2) Source: W11E106-05										
Total suspended solids	4	mg/L		2		4	0 (20)		05/12/11 :05/12/11	

Total Metals - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
Total Metals by ICPMS - Batch B11E252										
Blank (B11E252-BLK1)										
Copper	ND	ug/L		0.200					05/14/11 :05/19/11	
Zinc	ND	ug/L		0.500					05/14/11 :05/19/11	
LCS (B11E252-BS1)										
Copper	9.94	ug/L		0.200	10.0		99 (85-115)		05/14/11 :05/19/11	
Zinc	49.6	ug/L		0.500	50.0		99 (85-115)		05/14/11 :05/19/11	
Duplicate (B11E252-DUP1) Source: W11E104-02										
Copper	6.87	ug/L		0.200		6.91		0.6 (20)	05/14/11 :05/19/11	
Zinc	51.3	ug/L		0.500		51.5		0.3 (20)	05/14/11 :05/19/11	
Duplicate (B11E252-DUP3) Source: W11E107-02										
Copper	4.92	ug/L		0.200		4.96		0.8 (20)	05/14/11 :05/19/11	
Zinc	50.5	ug/L		0.500		50.7		0.4 (20)	05/14/11 :05/19/11	
Matrix Spike (B11E252-MS1) Source: W11E104-02										
Copper	16.0	ug/L		0.200	10.0	6.91	91 (70-130)		05/14/11 :05/19/11	
Zinc	99.7	ug/L		0.500	50.0	51.5	96 (70-130)		05/14/11 :05/19/11	
Matrix Spike (B11E252-MS2) Source: W11E107-02										
Copper	14.1	ug/L		0.200	10.0	4.96	92 (70-130)		05/14/11 :05/19/11	
Zinc	98.5	ug/L		0.500	50.0	50.7	95 (70-130)		05/14/11 :05/19/11	

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Jennifer Shackelford

Jennifer Shackelford, Production Coordinator



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11E272

Blank (B11E272-BLK1)

Acenaphthene	ND	ug/L	0.020	0.020					05/16/11 :05/17/11	
Acenaphthylene	ND	ug/L	0.020	0.020					05/16/11 :05/17/11	
Anthracene	ND	ug/L	0.020	0.020					05/16/11 :05/17/11	
Benzo(a)anthracene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Benzo(a)pyrene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Benzo(b)fluoranthene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Benzo(g,h,i)perylene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Benzo(k)fluoranthene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Chrysene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Dibenzo(a,h)anthracene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Fluoranthene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Fluorene	ND	ug/L	0.020	0.020					05/16/11 :05/17/11	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
1-Methylnaphthalene	ND	ug/L	0.040	0.040					05/16/11 :05/17/11	
2-Methylnaphthalene	ND	ug/L	0.040	0.040					05/16/11 :05/17/11	
Naphthalene	ND	ug/L	0.040	0.040					05/16/11 :05/17/11	
Phenanthrene	ND	ug/L	0.020	0.020					05/16/11 :05/17/11	
Pyrene	ND	ug/L	0.010	0.010					05/16/11 :05/17/11	
Butyl benzyl phthalate	ND	ug/L	0.50	1.0					05/16/11 :05/17/11	
Di-n-butyl phthalate	ND	ug/L	0.50	1.0					05/16/11 :05/17/11	
Diethyl phthalate	ND	ug/L	0.50	1.0					05/16/11 :05/17/11	
Dimethyl phthalate	ND	ug/L	0.50	1.0					05/16/11 :05/17/11	
Di-n-octyl phthalate	ND	ug/L	0.50	1.0					05/16/11 :05/17/11	
Bis(2-ethylhexyl) phthalate	ND	ug/L	0.50	1.0					05/16/11 :05/17/11	

Surrogate

2-Methylnaphthalene-d10	0.17			ug/L	0.216		78		05/16/11 :05/17/11	
Fluoranthene-d10	0.26			ug/L	0.216		118		05/16/11 :05/17/11	

LCS (B11E272-BS1)

Acenaphthene	0.109	ug/L	0.020	0.020	0.108		100 (39-136)		05/16/11 :05/17/11	
Acenaphthylene	0.109	ug/L	0.020	0.020	0.108		100 (48-134)		05/16/11 :05/17/11	
Anthracene	0.127	ug/L	0.020	0.020	0.108		118 (55-133)		05/16/11 :05/17/11	
Benzo(a)anthracene	0.116	ug/L	0.010	0.010	0.108		108 (53-140)		05/16/11 :05/17/11	
Benzo(a)pyrene	0.107	ug/L	0.010	0.010	0.108		99 (42-135)		05/16/11 :05/17/11	
Benzo(b)fluoranthene	0.115	ug/L	0.010	0.010	0.108		106 (46-137)		05/16/11 :05/17/11	
Benzo(g,h,i)perylene	0.0903	ug/L	0.010	0.010	0.108		84 (32-142)		05/16/11 :05/17/11	
Benzo(k)fluoranthene	0.116	ug/L	0.010	0.010	0.108		108 (46-128)		05/16/11 :05/17/11	
Chrysene	0.121	ug/L	0.010	0.010	0.108		112 (64-142)		05/16/11 :05/17/11	
Dibenzo(a,h)anthracene	0.0984	ug/L	0.010	0.010	0.108		91 (32-144)		05/16/11 :05/17/11	
Fluoranthene	0.131	ug/L	0.010	0.010	0.108		121 (57-142)		05/16/11 :05/17/11	
Fluorene	0.113	ug/L	0.020	0.020	0.108		104 (50-135)		05/16/11 :05/17/11	

Reported: 05/31/11 14:48

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Jennifer Shackelford

Jennifer Shackelford, Production Coordinator



City of Portland
Water Pollution Control Laboratory

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



Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11E272

LCS (B11E272-BS1)

Indeno(1,2,3-cd)pyrene	0.0989	ug/L	0.010	0.010	0.108		92 (33-143)		05/16/11 :05/17/11	
1-Methylnaphthalene	0.126	ug/L	0.040	0.040	0.108		116 (50-150)		05/16/11 :05/17/11	
2-Methylnaphthalene	0.130	ug/L	0.040	0.040	0.108		120 (50-150)		05/16/11 :05/17/11	
Naphthalene	0.122	ug/L	0.040	0.040	0.108		113 (46-157)		05/16/11 :05/17/11	
Phenanthrene	0.120	ug/L	0.020	0.020	0.108		111 (57-137)		05/16/11 :05/17/11	
Pyrene	0.121	ug/L	0.010	0.010	0.108		112 (59-136)		05/16/11 :05/17/11	
Butyl benzyl phthalate	1.23	ug/L	0.50	1.0	1.08		114 (66-152)		05/16/11 :05/17/11	
Di-n-butyl phthalate	1.40	ug/L	0.50	1.0	1.08		130 (73-157)		05/16/11 :05/17/11	
Diethyl phthalate	1.35	ug/L	0.50	1.0	1.08		125 (62-166)		05/16/11 :05/17/11	
Dimethyl phthalate	1.35	ug/L	0.50	1.0	1.08		125 (60-157)		05/16/11 :05/17/11	
Di-n-octyl phthalate	1.26	ug/L	0.50	1.0	1.08		116 (27-173)		05/16/11 :05/17/11	
Bis(2-ethylhexyl) phthalate	1.35	ug/L	0.50	1.0	1.08		125 (29-185)		05/16/11 :05/17/11	

Surrogate

2-Methylnaphthalene-d10	0.15			ug/L	0.216		69 (44-131)		05/16/11 :05/17/11	
Fluoranthene-d10	0.27			ug/L	0.216		124 (54-150)		05/16/11 :05/17/11	

Matrix Spike (B11E272-MS1)

Source: W11E103-01

Acenaphthene	0.369	ug/L	0.020	0.020	0.270	0.138	85 (39-136)		05/16/11 :05/17/11	
Acenaphthylene	0.329	ug/L	0.020	0.020	0.270	0.0773	93 (48-134)		05/16/11 :05/17/11	
Anthracene	0.657	ug/L	0.020	0.020	0.270	0.384	101 (55-133)		05/16/11 :05/17/11	
Benzo(a)anthracene	1.98	ug/L	0.010	0.010	0.270	1.73	92 (53-140)		05/16/11 :05/17/11	M9
Benzo(a)pyrene	2.11	ug/L	0.010	0.010	0.270	1.99	44 (42-135)		05/16/11 :05/17/11	M9
Benzo(b)fluoranthene	2.54	ug/L	0.010	0.010	0.270	2.52	9 (46-137)		05/16/11 :05/17/11	M9
Benzo(g,h,i)perylene	1.49	ug/L	0.010	0.010	0.270	1.31	67 (32-142)		05/16/11 :05/17/11	M9
Benzo(k)fluoranthene	1.24	ug/L	0.010	0.010	0.270	0.879	134 (46-128)		05/16/11 :05/17/11	M7
Chrysene	2.40	ug/L	0.010	0.010	0.270	2.16	89 (32-142)		05/16/11 :05/17/11	M9
Dibenzo(a,h)anthracene	0.719	ug/L	0.010	0.010	0.270	0.456	97 (32-144)		05/16/11 :05/17/11	
Fluoranthene	3.54	ug/L	0.050	0.050	0.270	3.37	63 (57-142)		05/16/11 :05/17/11	M9
Fluorene	0.353	ug/L	0.020	0.020	0.270	0.0892	98 (50-135)		05/16/11 :05/17/11	
Indeno(1,2,3-cd)pyrene	1.40	ug/L	0.010	0.010	0.270	1.21	73 (33-143)		05/16/11 :05/17/11	M9
1-Methylnaphthalene	0.272	ug/L	0.040	0.040	0.270	ND	101 (50-150)		05/16/11 :05/17/11	
2-Methylnaphthalene	0.277	ug/L	0.040	0.040	0.270	ND	102 (50-150)		05/16/11 :05/17/11	
Naphthalene	0.266	ug/L	0.040	0.040	0.270	0.0514	79 (46-157)		05/16/11 :05/17/11	
Phenanthrene	1.54	ug/L	0.020	0.020	0.270	1.34	73 (57-137)		05/16/11 :05/17/11	M9
Pyrene	3.39	ug/L	0.050	0.050	0.270	3.28	40 (59-136)		05/16/11 :05/17/11	M9
Butyl benzyl phthalate	2.79	ug/L	0.50	1.0	2.70	ND	103 (66-152)		05/16/11 :05/17/11	
Di-n-butyl phthalate	2.94	ug/L	0.50	1.0	2.70	ND	109 (73-157)		05/16/11 :05/17/11	
Diethyl phthalate	2.95	ug/L	0.50	1.0	2.70	ND	109 (62-166)		05/16/11 :05/17/11	
Dimethyl phthalate	2.98	ug/L	0.50	1.0	2.70	ND	110 (60-157)		05/16/11 :05/17/11	
Di-n-octyl phthalate	2.92	ug/L	0.50	1.0	2.70	ND	108 (27-173)		05/16/11 :05/17/11	
Bis(2-ethylhexyl) phthalate	3.67	ug/L	0.50	1.0	2.70	1.01	99 (29-185)		05/16/11 :05/17/11	

Surrogate

Reported: 05/31/11 14:48

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Jennifer Shackelford, Production Coordinator



City of Portland
Water Pollution Control Laboratory

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Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Semivolatile Organics - SIM - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
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Polynuclear Aromatics & Phthalates by GCMS-SIM - Batch B11E272

Matrix Spike (B11E272-MS1)

Source: W11E103-01

Surrogate

2-Methylnaphthalene-d10	0.17			ug/L	0.216		77 (44-131)		05/16/11 :05/17/11	
Fluoranthene-d10	0.23			ug/L	0.216		106 (54-150)		05/16/11 :05/17/11	

Matrix Spike Dup (B11E272-MSD1)

Source: W11E103-01

Acenaphthene	0.368	ug/L	0.020	0.020	0.270	0.138	85 (39-136)	0.1 (50)	05/16/11 :05/17/11	
Acenaphthylene	0.329	ug/L	0.020	0.020	0.270	0.0773	93 (48-134)	0.2 (50)	05/16/11 :05/17/11	
Anthracene	0.625	ug/L	0.020	0.020	0.270	0.384	89 (55-133)	5 (50)	05/16/11 :05/17/11	
Benzo(a)anthracene	1.77	ug/L	0.010	0.010	0.270	1.73	17 (53-140)	11 (50)	05/16/11 :05/17/11	M9
Benzo(a)pyrene	1.92	ug/L	0.010	0.010	0.270	1.99	-26 (42-135)	9 (50)	05/16/11 :05/17/11	M9
Benzo(b)fluoranthene	2.24	ug/L	0.010	0.010	0.270	2.52	-103 (46-137)	13 (50)	05/16/11 :05/17/11	M9
Benzo(g,h,i)perylene	1.36	ug/L	0.010	0.010	0.270	1.31	19 (32-142)	9 (50)	05/16/11 :05/17/11	M9
Benzo(k)fluoranthene	1.19	ug/L	0.010	0.010	0.270	0.879	115 (46-128)	4 (50)	05/16/11 :05/17/11	
Chrysene	2.10	ug/L	0.010	0.010	0.270	2.16	-20 (32-142)	13 (50)	05/16/11 :05/17/11	M9
Dibenzo(a,h)anthracene	0.633	ug/L	0.010	0.010	0.270	0.456	65 (32-144)	13 (50)	05/16/11 :05/17/11	
Fluoranthene	3.37	ug/L	0.050	0.050	0.270	3.37	0 (57-142)	5 (50)	05/16/11 :05/17/11	M9
Fluorene	0.353	ug/L	0.020	0.020	0.270	0.0892	98 (50-135)	0 (50)	05/16/11 :05/17/11	
Indeno(1,2,3-cd)pyrene	1.30	ug/L	0.010	0.010	0.270	1.21	34 (33-143)	8 (50)	05/16/11 :05/17/11	M9
1-Methylnaphthalene	0.283	ug/L	0.040	0.040	0.270	ND	105 (50-150)	4 (50)	05/16/11 :05/17/11	
2-Methylnaphthalene	0.289	ug/L	0.040	0.040	0.270	ND	107 (50-150)	4 (50)	05/16/11 :05/17/11	
Naphthalene	0.274	ug/L	0.040	0.040	0.270	0.0514	82 (46-157)	3 (50)	05/16/11 :05/17/11	
Phenanthrene	1.41	ug/L	0.020	0.020	0.270	1.34	26 (57-137)	8 (50)	05/16/11 :05/17/11	M9
Pyrene	3.26	ug/L	0.050	0.050	0.270	3.28	-9 (59-136)	4 (50)	05/16/11 :05/17/11	M9
Butyl benzyl phthalate	3.19	ug/L	0.50	1.0	2.70	ND	118 (66-152)	13 (50)	05/16/11 :05/17/11	
Di-n-butyl phthalate	3.23	ug/L	0.50	1.0	2.70	ND	120 (73-157)	9 (50)	05/16/11 :05/17/11	
Diethyl phthalate	3.19	ug/L	0.50	1.0	2.70	ND	118 (62-166)	8 (50)	05/16/11 :05/17/11	
Dimethyl phthalate	3.20	ug/L	0.50	1.0	2.70	ND	118 (60-157)	7 (50)	05/16/11 :05/17/11	
Di-n-octyl phthalate	3.15	ug/L	0.50	1.0	2.70	ND	117 (27-173)	7 (50)	05/16/11 :05/17/11	
Bis(2-ethylhexyl) phthalate	3.90	ug/L	0.50	1.0	2.70	1.01	107 (29-185)	6 (50)	05/16/11 :05/17/11	

Surrogate

2-Methylnaphthalene-d10	0.15			ug/L	0.216		67 (44-131)		05/16/11 :05/17/11	
Fluoranthene-d10	0.22			ug/L	0.216		100 (54-150)		05/16/11 :05/17/11	

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Water Pollution Control Laboratory
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Project: **Portland Harbor**
Work Order: **W11E103**

Client: Director's Office
Project Mgr: Linda Scheffler

Polychlorinated Biphenyls (PCBs) - QC

Analyte	Result	Units	MDL	MRL	Spike Level	Source Result	%Rec (Limits)	RPD (Limit)	Prepared: Analyzed	Qualifier
PCB Aroclors by GC-ECD - Batch B11E320										
Blank (B11E320-BLK1)										
Aroclor 1016/1242	ND	ug/L		0.0250					05/19/11 :05/23/11	
Aroclor 1221	ND	ug/L		0.0500					05/19/11 :05/23/11	
Aroclor 1232	ND	ug/L		0.0250					05/19/11 :05/23/11	
Aroclor 1248	ND	ug/L		0.0250					05/19/11 :05/23/11	
Aroclor 1254	ND	ug/L		0.0250					05/19/11 :05/23/11	
Aroclor 1260	ND	ug/L		0.0250					05/19/11 :05/23/11	
Aroclor 1262	ND	ug/L		0.0250					05/19/11 :05/23/11	
Aroclor 1268	ND	ug/L		0.0250					05/19/11 :05/23/11	
Surrogate										
Tetrachloro-m-xylene	0.0328			ug/L	0.0500		66		05/19/11 :05/23/11	
Decachlorobiphenyl	0.0402			ug/L	0.0500		80		05/19/11 :05/23/11	
LCS (B11E320-BS1)										
Aroclor 1016/1242	0.1911	ug/L		0.0250	0.250		76 (64-122)		05/19/11 :05/23/11	
Aroclor 1260	0.1873	ug/L		0.0250	0.250		75 (66-122)		05/19/11 :05/23/11	
Surrogate										
Tetrachloro-m-xylene	0.0358			ug/L	0.0500		72 (41-107.6)		05/19/11 :05/23/11	
Decachlorobiphenyl	0.0430			ug/L	0.0500		86 (8.3-153)		05/19/11 :05/23/11	
LCS Dup (B11E320-BSD1)										
Aroclor 1016/1242	0.2001	ug/L		0.0250	0.250		80 (64-122)	5 (20)	05/19/11 :05/23/11	
Aroclor 1260	0.1913	ug/L		0.0250	0.250		77 (66-122)	2 (20)	05/19/11 :05/23/11	
Surrogate										
Tetrachloro-m-xylene	0.0359			ug/L	0.0500		72 (41-107.6)		05/19/11 :05/23/11	
Decachlorobiphenyl	0.0421			ug/L	0.0500		84 (8.3-153)		05/19/11 :05/23/11	

Qualifiers

- M11 Matrix spike recovery for this analyte was high; the analyte was not detected in the sample and results are not affected.
- M5 Based on high matrix spike recovery, the sample result should be considered an estimate due to matrix effect and/or non-homogeneous matrix.
- M7 Based on high matrix spike recovery, sample results should be considered estimates due to matrix effect and/or non-homogeneous matrix.
- M9 Matrix spike recovery control limits are not applicable because the sample concentration is greater than 4 times the spike amount.

Definitions

DET	Analyte Detected	ND	Analyte Not Detected at or above the reporting limit
MRL	Method Reporting Limit	MDL	Method Detection Limit
NR	Not Reportable	dry	Sample results reported on a dry weight basis
% Rec.	Percent Recovery	RPD	Relative Percent Difference

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Jennifer Shackelford

Jennifer Shackelford, Production Coordinator



City of Portland
Chain-of-Custody

Bureau of Environmental Services



Date: 5/11/11
Work Order #: W11E103
Collected By: MSS, AJA

Client Name: Director's Office Matrix: Stormwater
Project Name: Portland Harbor

Requested Analyses

Special Instructions:					Requested Analyses											
Basin S-1 Stormwater (Revised 4/11/11)					TSS	TOC	Totals Metals (Cu, Zn)	PAH + Phthalates ¹	PCB Aroclors (Low-level)						# of Containers	Remarks
Lab Number	Location ID	Sample Date	Sample Time	Sample Type												
01	S1_SW1	5/11/11	1826	G	•	•	•	•	•	•					AAM131 Downstream of manhole	
02	S1_SW3	}	1815	G	•	•	•	•	•	•					AAM133 Downstream of manhole	
03	S1_SW4		1802	G	•	•	•	•	•	•					AAM133 Upstream 15" lateral	
04	S1_SW5		1735	G	•	•	•	•	•	•					AAM127 Upstream 21" main	
05	S1_SW6		1750	G	•	•	•	•	•	•					AAM138 Upstream in lateral from SW	
06	FIELDUP			G	•	•	•	•	•	•					Field Duplicate	

Inquired By: Matt Sullivan Date: 5/12/11 Relinquished By: Rona Kluck Date: 5/12/11
Signature: [Signature] Signature: [Signature]
Printed Name: Matt Sullivan Printed Name: Rona Kluck
Time: 0836 Time: 0836

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Portland
9405 SW Nimbus Ave.
Beaverton, OR 97008
Tel: (503) 906-9200

TestAmerica Job ID: PUE0392

Client Project/Site: W11E103
Client Project Description: Portland Harbor

For:

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

Attn: Renee Chauvin



Authorized for release by:
05/31/2011 02:24:48 PM

Darrell Auvil
Project Manager
darrell.auvil@testamericainc.com

LINKS

Review your project
results through

TotalAccess

Have a Question?



Visit us at:

www.testamericainc.com

Results relate only to the items tested and the sample(s) as received by the laboratory. The test results in this report meet all 2003 NELAC requirements for accredited parameters, exceptions are noted in this report. Pursuant to NELAC, this report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Sample Summary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11E103

TestAmerica Job ID: PUE0392

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
PUE0392-01	W11E103-01 (S1_SW1)	Stormwater	05/11/11 18:26	05/12/11 18:53
PUE0392-02	W11E103-02 (S1_SW3)	Stormwater	05/11/11 18:15	05/12/11 18:53
PUE0392-03	W11E103-03 (S1_SW4)	Stormwater	05/11/11 18:02	05/12/11 18:53
PUE0392-04	W11E103-04 (S1_SW5)	Stormwater	05/11/11 17:35	05/12/11 18:53
PUE0392-05	W11E103-05 (S1_SW6)	Stormwater	05/11/11 17:50	05/12/11 18:53
PUE0392-06	W11E103-06 (Field Duplicate)	Water	05/11/11 00:00	05/12/11 18:53

- 1
- 2
- 3
- 4
- 5
- 6

Definitions/Glossary

Client: City of Portland Water Pollution Laboratory
Project/Site: W11E103

TestAmerica Job ID: PUE0392

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis.
EPA	United States Environmental Protection Agency
ND	Not Detected above the reporting level.
MDL	Method Detection Limit
RL	Reporting Limit
RE, RE1 (etc.)	Indicates a Re-extraction or Reanalysis of the sample.
%R	Percent Recovery
RPD	Relative Percent Difference, a measure of the relative difference between two points.

- 1
- 2
- 3
- 4
- 5
- 6

Client Sample Results

Client: City of Portland Water Pollution Laboratory
Project/Site: W11E103

TestAmerica Job ID: PUE0392

Client Sample ID: W11E103-01 (S1_SW1)

Date Collected: 05/11/11 18:26

Date Received: 05/12/11 18:53

Lab Sample ID: PUE0392-01

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3.14		1.00		mg/l		05/17/11 11:55	05/17/11 23:38	1.00

Client Sample ID: W11E103-02 (S1_SW3)

Date Collected: 05/11/11 18:15

Date Received: 05/12/11 18:53

Lab Sample ID: PUE0392-02

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	4.11		1.00		mg/l		05/17/11 11:55	05/17/11 23:38	1.00

Client Sample ID: W11E103-03 (S1_SW4)

Date Collected: 05/11/11 18:02

Date Received: 05/12/11 18:53

Lab Sample ID: PUE0392-03

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	4.52		1.00		mg/l		05/17/11 11:55	05/17/11 23:38	1.00

Client Sample ID: W11E103-04 (S1_SW5)

Date Collected: 05/11/11 17:35

Date Received: 05/12/11 18:53

Lab Sample ID: PUE0392-04

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	2.19		1.00		mg/l		05/17/11 11:55	05/17/11 23:38	1.00

Client Sample ID: W11E103-05 (S1_SW6)

Date Collected: 05/11/11 17:50

Date Received: 05/12/11 18:53

Lab Sample ID: PUE0392-05

Matrix: Stormwater

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	3.83		1.00		mg/l		05/17/11 11:55	05/17/11 23:38	1.00

Client Sample ID: W11E103-06 (Field Duplicate)

Date Collected: 05/11/11 00:00

Date Received: 05/12/11 18:53

Lab Sample ID: PUE0392-06

Matrix: Water

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	4.52		1.00		mg/l		05/17/11 11:55	05/17/11 23:38	1.00

QC Sample Results

Client: City of Portland Water Pollution Laboratory
Project/Site: W11E103

TestAmerica Job ID: PUE0392

Method: SM 5310C - Conventional Chemistry Parameters per Standard Methods

Lab Sample ID: 11E0465-BLK1

Matrix: Water

Analysis Batch: 11E0465

Client Sample ID: 11E0465-BLK1

Prep Type: Total

Prep Batch: 11E0465_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.00		mg/l		05/17/11 11:55	05/17/11 23:38	1.00

Lab Sample ID: 11E0465-BS1

Matrix: Water

Analysis Batch: 11E0465

Client Sample ID: 11E0465-BS1

Prep Type: Total

Prep Batch: 11E0465_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	20.0	19.0		mg/l		95.0	85 - 115

Lab Sample ID: 11E0465-MS1

Matrix: Water

Analysis Batch: 11E0465

Client Sample ID: PUE0314-01

Prep Type: Total

Prep Batch: 11E0465_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	% Rec	% Rec. Limits
Total Organic Carbon	8.70		25.0	33.2		mg/l		97.9	75 - 125

Lab Sample ID: 11E0465-DUP1

Matrix: Water

Analysis Batch: 11E0465

Client Sample ID: PUE0314-01

Prep Type: Total

Prep Batch: 11E0465_P

Analyte	Sample Result	Sample Qualifier	Duplicate Result	Duplicate Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon	8.70		8.93		mg/l		2.57	20

SUBCONTRACT ORDER
City of Portland Water Pollution Control Lab
W11E103

PUE0392

SENDING LABORATORY:

City of Portland Water Pollution Control Lab
6543 N. Burlington Ave
Portland, OR 97203
Phone: 503-823-5600
Fax: 503-823-5656
Invoice To: Charles Lytle using P.O.# 30001516

RECEIVING LABORATORY:

TestAmerica
9405 SW Nimbus Ave
Beaverton, OR 97008
Phone : (503) 906-9200
Fax: (503) 906-9210

WPCL Project Name
Portland Harbor

TURNAROUND REQUEST

☒ Standard
☐ Rush _ day(s)

Analysis	Due	Expires	Laboratory ID	Comments
<hr/>				
Sample ID: W11E103-01	Water	Sampled:05/11/11 18:26		
Out-TOC Water	05/26/11 17:00	06/08/11 18:26		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				
Sample ID: W11E103-02	Water	Sampled:05/11/11 18:15		
Out-TOC Water	05/26/11 17:00	06/08/11 18:15		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				
Sample ID: W11E103-03	Water	Sampled:05/11/11 18:02		
Out-TOC Water	05/26/11 17:00	06/08/11 18:02		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				
Sample ID: W11E103-04	Water	Sampled:05/11/11 17:35		
Out-TOC Water	05/26/11 17:00	06/08/11 17:35		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				
Sample ID: W11E103-05	Water	Sampled:05/11/11 17:50		
Out-TOC Water	05/26/11 17:00	06/08/11 17:50		
Containers Supplied: G amber 250ml H2SO4 (B)				
<hr/>				

Released By

Date

Received By

Date

Released By

Date

Received By

Date

SUBCONTRACT ORDER

City of Portland Water Pollution Control Lab

W11E103

PUE0392

Analysis	Due	Expires	Laboratory ID	Comments
<hr/>				
Sample ID: W11E103-06	Water	Sampled:05/11/11 00:00		
Out-TOC Water	05/26/11 17:00	06/08/11 00:00		
<i>Containers Supplied:</i>				
G amber 250ml H2SO4 (B)				

<i>[Signature]</i>	5/12/11	12:15	<i>[Signature]</i>	5/12/11 @ 12:15
Released By	Date		Received By	Date
<i>[Signature]</i>	5/12/11 @ 17:55	PM	<i>[Signature]</i>	5/12/11 @ 17:53
Released By	Date		Received By	Date

Portland Sample Control Checklist

Work Order #: PUE0392 Date/Time Received: 5/12/11 @ 17:55
 Client Name: W112103 CITY OF PORTLAND WATER POLLUTION CONTROL LAB
 Project Name: W112103

Time Zone:
☐ EDT/EST ☐ CDT/CST ☐ MDT/MST ☒ PDT/PST ☐ AK ☐ HI ☐ OTHER

Unpacking Checks:

Cooler (s): 1
 Temperature (s): 2, 4

Digi #1 ☐ Digi #2 ☐ IR Gun ☒ (☐ Plastic ☒ Glass)

Raytek ☐ (☐ Plastic ☐ Glass)

Ice used: (circle one) GEL LOOSE BLUE NONE OTHER: _____ Initials: PS

Temperature out of Range:

☐ Not enough or No Ice
☐ Ice Melted
☐ W/in 4 Hrs of collection
☐ Ice Not Needed
☐ Other: _____

N/A Yes No

- ☒ ☐ ☐ 1. If ESI client, were temp blanks received? If no, document on NOD.
- ☒ ☐ ☐ 2. Cooler Seals intact? (N/A if hand delivered) if no and ESI client, document on NOD.
- ☒ ☐ ☐ 3. Chain of Custody present? If no, document on NOD. Along with "received by" & "relinquished by" signatures with date & time?
- ☒ ☐ ☐ 4. Bottles received intact? If no, document on NOD.
- ☒ ☐ ☐ 5. Sample is not multiphasic? If no, document on NOD.
- ☐ ☒ ☐ 6. Sampler name/signature documented on COC?
- ☒ ☐ ☐ 7. Proper Container and preservatives used? If no, document on NOD.
- ☒ ☐ ☐ 8. pH for HN03/ESI samples checked and meet requirements? If no, document on NOD.
- ☒ ☐ ☐ 9. Cyanide samples checked for sulfides and meet requirements? If no, notify PM.
- ☒ ☐ ☐ 10. HF Dilution required?
- ☒ ☐ ☐ 11. Sufficient volume provided for all analysis and requested MS/MSD? If no, document on NOD and consult PM before proceeding.
- ☒ ☐ ☐ 12. Did chain of custody agree with samples received? If no, document on NOD.
- ☒ ☐ ☐ 13. Were VOA samples received without headspace?
- ☐ ☒ ☐ 14. Did samples require preservation with sodium thiosulfate?
- ☒ ☐ ☐ 15. If yes to #14, was the residual chlorine test negative? If no, document on NOD.
- ☒ ☐ ☐ 16. Are dissolved/field filtered metals bottles sediment-free? If no, document on NOD.
- ☒ ☐ ☐ 17. Are analyses with short holding times received in hold?
- ☒ ☐ ☐ 18. Were special log- in instructions read and followed?

Checklist Reviewed: _____ Log-in initials: pm Labeler initials: pm